

**The Role of Professional Identity into Explaining Saudi  
Arabian Healthcare Professional Resistance to  
Electronic Health Records' Stratigic Change in Public  
Hospitals**



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# Abstract

Electronic Health Record (EHR) is an application that captures patients' information and promises to improve healthcare services. Hence, many countries, including the developing country, such as Saudi Arabia, invested heavily to implement the system and improve healthcare service delivery. Yet, the system's adoption is slow, and failure is high, which could be related to healthcare professionals' resistance to change to the EHR applications. Further, despite the importance of the topic of EHR resistance, little research has been conducted in Saudi Arabia regarding healthcare professionals' resistance to change to EHR. Motivated thus, this research suggested that resistance to EHR in Saudi Arabia results from cultural and professional identity factors, which guide healthcare professionals' behaviour. Therefore, this research investigated how the professional identity of Saudi healthcare professionals can explain their resistance to using EHR applications. The study used identity theory as our main theoretical lens along with Hofstede cultural dimension theory and in-depth qualitative interviews to understand the EHR resistance to change phenomenon. Our study has revealed similarities between Saudi and Western healthcare professionals' factors that could contribute to EHR resistance. However, interestingly, cultural, and religious norms were also found to be one of the leading causes of Saudi healthcare professionals' resistance to the EHR change. Our theoretical contributions helped us understand the role of identity in EHR use in a place where professionals with a strong professional and cultural identity are the system's main users. In addition, our practical contributions aimed to help the Ministry of Health in Saudi Arabia to understand what healthcare professional needs before adapting an EHR system, or improve the current one. Further, it could help hospital managers address, understand, and solve the challenges facing healthcare professionals as they use the EHR system.

## **Key Words:**

Managing Change, EHR Resistance to Change, Saudi Culture, Strategic Management.

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# Declaration

This thesis is submitted in fulfilment for the degree of *Doctor of Philosophy*. It has not previously been submitted in support of an application for another degree at this or any other university. It is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by explicit references.

Some of this work has already been published and presented at (Aldoghiher, Tarafdar and Williams, 2022), and it has been noted on the conference and presentation page.

**Abdulrahman Saleh Aldoghiher**

# Chapter 1

## Introduction

This chapter aims to introduce to the reader the key elements of our research about Saudi healthcare professionals' resistance to electronic healthcare record systems. The first section will start with our research background and motivation. The second section will be justifying the choice of study context. The third section will outline our research aims and objectives, provide thesis structure, and finally, summarise our research contributions.

### 1.1 Study Background and Motivation

Electronic Health Record (EHR) applications capture patients' clinical information to improve the efficiency of healthcare services, and they have the potential to reduce cost, medical errors and improve patient care quality (Davidson *et al.*, 2018; Kim *et al.*, 2022). Hence, developing countries, such Saudi Arabia, have invested heavily in EHR to improve the healthcare process. Therefore, healthcare providers in the country adopted the EHR systems (Alanezi, 2020), with the first system being implemented dated in 1993 (Altuwaijri, 2008; Almalki *et al.*, 2011). Yet the adoption by healthcare professionals is slow (Alkrajji *et al.*, 2014) which can threaten the EHR's potential benefits. Healthcare professionals in this study refer to the individuals who have direct contact with their patients and use the EHR system, and specifically within this research it comprises physicians and nurses.

Arguably, most of the research to understand EHR resistance was conducted in developed countries, and that caused a lack of understanding of EHR resistance within developing countries (Shaikh & Karjaluo, 2015; Kumar *et al.*, 2020). Further, the challenges of previous researchers in developing countries, especially those in Saudi Arabia, have mainly addressed the technical factors (Alanazi *et al.*, 2020); but not all challenges that cause EHR resistance are related to technical factors (Abubakre *et al.*, 2017a; Kumar *et al.*, 2020). Some of the challenges could be attributed to the Saudi Arabian cultural

features, which may have resulted in healthcare professionals' resistance to EHR (Alkraiiji *et al.*, 2014; Weber *et al.*, 2017).

Resistance in this study is defined as the misuse, lack of use, or insistence not to use an installed system, and culture is defined as "a collective programming of the mind which distinguishes one group from another" (Hofstede, 2001, p. 9). Culture can affect the adoption of complex information system (IS) projects (Alhirz & Sajeev, 2015). Saudi Arabia has unique societal characteristics in terms of its social structure and religious values, which significantly shape people's cultural values<sup>1</sup>, social life and legal framework (Zakaria *et al.*, 2003). In particular, it is a collectivist culture that reflects placing family needs over those of the individual (Alhirz & Sajeev, 2015). These cultural values influence how people perceive and evaluate the world around them. Zakaria *et al.* (2003) indicated that "Arabic culture beliefs were a robust predictor of resistance to IS" (p. 51). To elaborate, Arabic culture is a personal interaction-driven culture (Zakaria *et al.*, 2003), meaning that patients prefer physicians to spend the consulting time personally interacting with them rather than looking at the computer screen. Heponiemi *et al.* (2017) suggested that using the EHR consumes 55% of the consultation time, which could affect patient satisfaction, and as a result, physicians might avoid using the system.

Additionally, while privacy is a universal issue, it holds greater importance in Saudi Arabia because of religious adherence to personal privacy. Hence, any threat to patient privacy due to EHR could be met with healthcare professionals' resistance to using these applications. Thus, such distinct social and cultural conditions are important factors for understanding how Saudi Arabian healthcare professionals perceive technology (Alkraiiji *et al.*, 2014).

In addition, many researchers have suggested different theories to understand end-user resistance to IS (e.g., Davis, 1989; Markus, 1983; Joshi, 1991); however, these have been criticised for a lack of deep understanding of the individuals' behaviour (Nach, 2015). Physicians and nurses consider themselves members of a professional group that is associated with a high level of power, knowledge, values and required skills (Moyo *et al.*, 2016). This self-perception is developed during their long medical education and guides

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<sup>1</sup> See Chapter 3, section 3.1.2 for the definition.

their behaviour as members of an occupational group (Moyo *et al.*, 2016). Thus, when their professional identity faces challenges, they tend to resist as their professional identity is highly resistant to change (Chreim *et al.*, 2007) and a primary motivator of behaviour (Carter & Grover, 2015). For instance, the culture of professionals' superiority in Saudi Arabia means that people who are highly educated or who have a professional role tend to be more respected (Zakaria *et al.*, 2003) resulting in having a high prestige status in Saudi society. Any threat to their position in such a society will cause resistant behaviour from physicians. Thus, this research suggests that resistance to EHRs among Saudi Arabian healthcare professionals results from cultural and professional identity factors which guide their behaviour.

Due to EHR's increased use and role in healthcare organisations (Walter & Lopez, 2008), identity has become a pressing contemporary issue, particularly among physicians and nurses. To address the problem outlined above, we utilised in-depth semi-structured interviews and identity theory as a main theoretical lens to achieve the aim of this study, which is to investigate how the professional identity of healthcare professionals can explain their resistance to the use of EHR applications. We have also employed Hofstede's theory of cultural dimensions due to its important role in understanding the phenomenon (Abubakre *et al.*, 2017a), and with the aim to integrate both theories to gain a deeper understanding of the EHR resistance phenomenon. This is to answer the call for utilising two theoretical lenses to have a better picture of the EHR phenomenon (Jackson, 2011; Kajol *et al.*, 2022)

Saudi Arabia was selected as an example of a developing country within the Middle East region for many reasons. To name a few, the Saudi government increased spending on healthcare from 8% in 2018 to more than 14% in 2022 to improve the healthcare service (Singhi, 2022). Yet the EHR adoption rate and expected benefits remain low, and failure is alarmingly high (Aldosari, 2017) which could be related to healthcare professionals' resistance to EHR (Kumar *et al.*, 2020). EHR's successful adoption in Saudi Arabia is vital because it is one of the main aspects of the Saudi 2030 vision, which is a plan to reduce the country's dependence on oil, diversify its economy and improve the public service sector, including healthcare services. The system's failure to achieve its goals will cause financial losses for the economy and hospitals (Aldosari, 2017).

## 1.2 Justification for Choosing Saudi Arabia

Saudi Arabia has been a country from its first state, was founded by the conservative Islamic religion and tradition, and is still considered a significant force to the Saudi people to date, which emphasises the significance of the Islamic faith and culture in the country<sup>2</sup>. In addition, Saudi Arabi is the largest nation in the Arabian Peninsula (Almatar, 2022)<sup>3</sup>, when it comes to its population, economy, and space. It is also a key player in the Arab and Muslim World (Alshahrani *et al.*, 2019) because it hosts the holiest two cities for Muslims: Mecca (the birthplace of Prophet Muhammed) and Al-Madinah (the place where Prophet Muhammed lived).

It is estimated that Saudi Arabia has a net population of 32 million rising annually by more than 3.2% (General Authority for Statistics, 2022). Hence, there is a constant need for more efficient healthcare facilities due to the rising population and the difficulties of delivering healthcare because of the geographic terrain (Alshahrani *et al.*, 2019). As such, the following list of the challenges facing the Saudi Arabian healthcare system justifies the choice of Saudi Arabia as a context for our study:

- The Saudi government's spending on healthcare has risen from 8% of the country's total gross domestic product (GDP) in 2018 to more than 14% in 2022. However, despite this massive investment, medical errors are still increasing in Saudi hospitals. According to Ghaffar *et al.* (2015), avoidable medical errors increased by more than 100% from 2003 to 2013. As such, several researchers expressed the importance of using the EHR to reduce medical errors in Saudi Arabia (Almalki *et al.*, 2021; Alshammari *et al.*, 2021), and, according to Alqahtani *et al.* (2017), EHR implementation could reduce medical errors by 55%.
- Despite the government's efforts and investment in EHR implementation for it to succeed, still, the adoption by healthcare professionals is slow in these countries (Alkrajji *et al.*, 2014), and resistance is high (Alanezi, 2021). The resistance to the EHR system change resulted in 90% of the EHR implementation in developing

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<sup>2</sup> For more information about the Saudi Arabian background, see chapter 3.

<sup>3</sup> Arabian Peninsula countries include Saudi Arabia, Bahrain, Oman, Qatar, Kuwait, and United Arab Emirates.



countries failing (Alaboudi *et al.*, 2016). Failing to achieve a successful change to the EHR system will lead to a negative financial consequences in Saudi Arabia (Dwivedi *et al.*, 2015). The success of the 2030 vision, particularly with such huge investment having been made in it, is our motivation to choose the Saudi context.

- Further motivation for our study context is the transformational change happening in Saudi Arabia, particularly in the healthcare sector. The Saudi government launched its optimistic plan called the 2030 Vision to reduce the country's oil dependency following the 2014 price drop. The government introduced a programme nationally which included a radical transformation of the healthcare sector in Saudi Arabia, to meet international standards, and provide better healthcare services (Al Khashan *et al.*, 2021). This will be achieved by improving healthcare infrastructure and increasing the use of EHR. Hence, it marks an essential motivation for our research and study context.
- Furthermore, because Saudi Arabia is the custodian of the two holiest cities for Muslims, Mecca and Al-Madinah, every year Muslims from over 180 countries around the world visit the country to perform Umrah and Hajj (Hoang *et al.*, 2020). These two rituals (Umrah and Hajj) attract more than 10 million participants every year (Hoang *et al.*, 2020). This number of pilgrims from different parts of the world is a challenge to the Saudi government and puts an enormous demand on healthcare services during this period. Therefore, such demand shows the importance of having an appropriate EHR for providing adequate healthcare services during the Hajj season (Al-Tawfiq & Memish, 2014).
- Finally, the Saudi Arabian culture poses a particular challenge when improving organisational performance as there is no separation between professional life and religious life, unlike in Western countries (Rice, 2003). Thus, it is necessary to understand people's culture to understand why they behave in a certain way (Rice, 2003) as culture is often blamed when it comes to IS project failure (Kwong & Levit, 2009). Therefore, contextual factors are essential to the successful implementation of healthcare innovations, as it is barely recorded, analysed or considered when implementing change (Grossi *et al.*, 2021).

## **1.3 Thesis Outline**

### **1.3.1 Research Aims and Objectives**

This thesis investigates how Saudi healthcare professionals' professional identity can explain their resistance to using EHR applications. It also aims to offer a critical evaluation of how the Saudi Arabian culture influences their decisions and behaviour towards the EHR system. In particular, it addresses the impact of the EHR use on the Saudi healthcare professionals' identity, relationship with their patients and the critical contribution to the future of the EHR system on Saudi Arabia and the region. As such, the following research objectives (ROs) will guide our study to achieve our overall aim:

- 1- Understanding the context of Saudi Arabia and Saudi Arabia's healthcare professionals.
- 2- Understanding the influence of the EHR system on Saudi healthcare professionals' identity, how they feel about it and how it impacts their work as a professional.
- 3- Understanding the differences between physicians' and nurses' professional identity and their rationale to resist the EHR.
- 4- Clarifying the rationale behind Saudi healthcare professionals' resistance to EHR.
- 5- Understanding the professional identity of Saudi Arabian healthcare professionals and why it leads them to EHR system resistance.
- 6- To investigate and understand how the EHR system can impact the relationship between healthcare professionals and their patients.

### **1.3.2 Thesis Structure**

This PhD thesis will be structured into the following chapters:

#### **Chapter 2: Literature Review**

This chapter presents the background of the Health Information System (HIS), particularly the EHR system. It also explains the research significance and literature on the subject of the IS/HIS worldwide. Finally, this chapter will outline our theoretical lens, which we will use to analyse our data, and our research questions.

### **Chapter 3: Context of Study: Culture of the Kingdom of Saudi Arabia**

This chapter provides the background cultural context of the research study to contextualise and facilitate understanding of the narrative the research seeks to tell. Hence, this chapter focuses on Saudi Arabia and its culture.

### **Chapter 4: Research Methods**

This chapter presents and explains the rationale behind the methods chosen to answer our research questions. It also provides justifications for adopting the tools and processes used to collect and analyse our qualitative data and strategies used to ensure the research is rigorous.

### **Chapter 5: Findings**

This chapter presents the findings from our 42 in-depth interviews with both physicians and nurses. It will present these findings by structuring them into major themes and then sub-themes which were generated during the coding process.

### **Chapter 6: Theorisation and Discussion**

This chapter will interpret the findings from the previous chapter with respect to identity theory, along with positioning research outcomes in the current literature to answer our research questions. The discussion mainly focuses on the influence of the EHR system on the professional identity of Saudi healthcare professionals, how professional identity could explain EHR resistance to change from Saudi healthcare professionals, and how it influences the relationship between healthcare professionals and their patients.

### **Chapter 7: Conclusion and Contributions**

This chapter will summarise the major findings and identify the main contributions of this research to the field. It will also highlight the research limitations and suggestions for future studies.

## 1.4 Thesis Contributions

This research contributes to the existing body of knowledge in three main ways: theoretically, contextually, and practically. These contributions will be summarised below, and detailed explanations are provided in Chapter 7, which concludes this thesis.

The theoretical contributions are as follows:

- A contribution to identity theory by identifying novel aspects that play a major role in healthcare professionals' resistance to the EHR application change. These are cultural, religious and reputation identity. We move further and explicitly identify an aspect within the religious identity, for example, and recognise the *Itqan* identity as a factor for resistance.
- This research is the first study to address how professional identity could contribute to Saudi healthcare professionals' resistance to EHR applications. Our study identified factors of EHR resistance which have not been identified in Western countries (e.g., *Et-Moone*, *Ehtesab*, *Taqwa*, and *Faz'za*). This illustrates that each of these factors is important for Saudi healthcare professionals, as they consider these actions are part of their worship of God.
- Our findings showed that professional identity is stronger with cultural and religious identity, despite governmental pressure, which contradicts Mishra *et al.*'s (2012) conclusion.
- Our findings showed that professional identity, specifically, Saudi healthcare professionals' autonomy is not as strong as the literature stated. In countries with a strong culture and conservative society, culture and religious identity have priority over professional identity. We can see that in how professionals risk a lack of information or critical information about the patient to protect patient privacy when they request from a healthcare professional not to record certain information.

- Contributions to professional identity and Hofstede's theory of cultural dimensions by integrating both theories to gain a deeper understanding of the EHR resistance phenomenon. This was an answer to calls for utilising two theories to get a better understanding of the phenomenon, specifically integrating identity theory with other lenses to form a better picture of the cultural aspects of EHR resistance (Jackson, 2011; Kajol *et al.*, 2022).
- Building on the discussion of Maillet *et al.* (2015) for the need to understand end-user behaviour due to the lack of study in this area. We have found dissatisfaction among physicians when using the system, yet their expressions of dissatisfaction have not been seen in the literature (e.g., *Wasta*).
- Understanding the differences of resistance behaviour reasoning between physicians and nurses is essential. Both of them have professional identity, yet each of them has a separate understanding of their professional role. Hence, for a successful implementation of the EHR, it is crucial to identify what drives each type of these end-users' resistance towards EHR. Our research identified the differences and rationale for each of the healthcare professional's behaviour towards EHR, which is built on the call from Alohalil *et al.* (2020) and Abouzahra *et al.* (2022).

In addition, the following contextual contributions to the literature were made to the context of our study:

- Our study went beyond social factors and identified a specific motivating factor that occurs which would cause the EHR resistance (e.g., protecting family member information and *Et-Moone*).
- Several reports suggested that understanding EHR resistance could not be sufficient without considering and understanding the local culture (Kumar *et al.*, 2020; Grossi *et al.*, 2021). Our thesis contributes to the literature by specifically explaining a phenomenon driven by cultural reasoning and how it can cause resistance behaviour (e.g., not recording drinking alcohol information).

Finally, the following practical contributions have been made that should help hospital managers and the Ministry of Health (MoH) in Saudi Arabia:

- Hospital managers should consider healthcare professionals' concerns in order to make headway towards the success of the EHR implementation (e.g., privacy and policy).
- The MoH should consider the local culture when purchasing a Western EHR system that has been designed for a specific local culture within that country. Further, since the MoH is responsible for healthcare success as part of the 2030 vision, this study makes a vital contribution towards the success of the Saudi Vision 2030. This is because the successful implementation of the EHR is a crucial part of the 2030 vision which aims to improve patient care quality.
- Contributions for the non-Saudi healthcare professional workers, as the discovered religious and cultural findings can guide non-Saudi healthcare professionals with regard to how to deal with their Saudi patients, which could enhance patient satisfaction.

# Chapter 2

## Literature Review

This chapter will introduce the background literature related to the HIS, mainly EHR, and the issues surrounding resistance to the EHR, as well as prior research exploring the role of identity theory and healthcare professionals with regard to EHR resistance. It is structured into five sections: first, background about the HIS and its applications; second, EHR challenges worldwide; third, resistance to EHR; fourth, identity theory; and finally, a chapter summary. The context of the study, which focuses on the culture of Saudi Arabia, is provided in the next chapter. The main objectives of this chapter are the following:

- To clarify and define terms related to health information systems,
- To critically review related literature on health information systems,
- To critically review related literature on resistance to change with regard to EHR systems, and
- To introduce the theoretical lens for the research.

### 2.1 Background Regarding Health Information Systems

In the healthcare sector, as in other areas of human life, the use of information systems (IS) has increased rapidly, as they are under pressure to provide more health information and better quality and faster services, with an expectation of lowering costs (Laukka *et al.*, 2020; Borg *et al.*, 2022; Alsalman *et al.*, 2021). However, with a substantial increase in the world population (Ahmed, 2014), medical errors and healthcare costs (Davidson *et al.*, 2018), the healthcare delivery faces challenges in meeting the increased demands. To illustrate, in the United States (US), healthcare spending consumes the largest share of public spending, with 19.7% of the GDP.

Therefore, HIS, particularly EHR, has been seen as a solution to the above challenges in healthcare sectors (Gjellebæk *et al.*, 2020). Hence, governments worldwide increased their investment in implementing EHR (Kim *et al.*, 2019; Kumar *et al.*, 2022) to improve the quality, safety and efficiency of healthcare and reduce costs and medical errors

(Laukka *et al.*, 2020; Kumar *et al.*, 2020; Al-Samarraie *et al.*, 2020). For example, the EHR system has been vital for healthcare professionals' decisions on public health policies during the COVID-19 pandemic because it provided them with timely access to patients' files and essential information (Fennelly *et al.*, 2020).

HIS refers to using information and communication technologies (ICT) to improve healthcare (Morgan, 2016). HIS is considered an umbrella for several applications such as Computerised Provider Order Entry (CPOE)<sup>4</sup>, picture archiving and communication systems (PACS)<sup>5</sup> and Clinical Decision Support Systems (CDSS)<sup>6</sup>. These technologies can help to facilitate the ease of storing, accessing, sharing, and transferring information for different purposes (Hemmat *et al.*, 2017), and in our research, all these technologies fall under the definition of EHR.

HIS, especially the EHR system is an important topic; therefore, the World Health Organisation (WHO) realised the value of investigating this field and recently called for more studies on EHR (Alshahrani *et al.*, 2019). This is due to the challenges and struggles that face hospitals in implementing EHR systems, as it has been reported that the failure rate of EHR projects in healthcare is higher than in any other industry (Alharthi, 2018; Laukka *et al.*, 2020). User resistance is considered the leading cause of EHR project failure, and it has been noted that finding ways to counter resistance to adopting EHR technologies is the core element of the system's successful deployment (Alzahrani *et al.*, 2021).

### **2.1.1 Electronic Health Records**

The EHR system first appeared within individual countries between the early 1970s to early 1990s, with several early projects leading the way (e.g., COSTAR, HELP, TMR)<sup>7</sup> and multiple hospitals worldwide were starting to use these technologies (McLean, 2006; Evans, 2016; Kumar *et al.*, 2020; Alanazi *et al.*, 2020). However, these projects suffered

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<sup>4</sup> The CPOE is a medication ordering and fulfilment system; it can be very advanced and help care providers with lab orders, radiology studies, procedures, dischargers, transfers and referrals (Glenn *et al.*, 2004).

<sup>5</sup> The PACS system captures the diagnostic images from devices such as x-ray machines and stores them for different applications such as EHRs (Glenn *et al.*, 2004).

<sup>6</sup> CDSS is an application which could help healthcare providers with real-time diagnostics and recommendations for treatment (Glenn *et al.*, 2004).

<sup>7</sup> For more information, read McLean, 2006.



from significant technical and function issues, such as non-standard terminologies and system interfaces, which continue to cause problems for the successful implementation of EHR projects (McLean, 2006).

Importantly, none of these early systems contained all the patients' information, as they were, and still are, a hybrid system of patient data comprising digital and paper records (Evans, 2016). However, since the inadequacy of the paper record became more apparent in 1992 (Ornstein *et al.*, 1992), the Institute of Medicine (IOM) promoted the change from paper-based to EHR (Evans, 2016). In addition, the IOM supported the promotion of the digital shift for the patients' information in a report which caught international attention by estimating that 44,000 to 98,000 patients die annually because of medical errors.

It is essential to note that EHR has been created to be used by healthcare professionals (Seymour *et al.*, 2012), as the main aim of such systems is to improve healthcare services and ensure patients' privacy (Aldosari *et al.*, 2018; Kumar *et al.*, 2020). Therefore, EHR became protected in the US under a federal law called the Health Insurance Portability and Accountability Act (HIPAA). HIPAA aims to make healthcare insurance more affordable and accessible and protect patients' information (Wager *et al.*, 2021).

### **2.1.2 EHR Definition**

There is no universal definition that has been agreed on for the EHR, as the term itself is known by different names around the world, such as Electronic Medical Records (EMR), Computer-Based Patient Record (CPRs) and Automated Health Records (AHR) (HIMSS, 2019). However, in this research we will use the term EHR. The following paragraph will outline several EHR definitions and the one adopted in this study.

Because there is no shared definition for EHRs, several authors have different meanings for the concept (HIMSS, 2019; Kholi & Tan, 2016; Garde *et al.*, 2007). Hence, for the purposes of this research, the term EHR in our study will encompass all of the following elements. These elements are:

1. A system that captures patient health information, and also includes information such as patient demographics, health progress note, problems, medications, vital

signs, past medical history, ammunitions, laboratory data and radiology reports (HIMSS, 2019).

2. "EHRs are those applications that aims to improve patient and healthcare professionals' communications, and to enhance patients' care services (Kholi & Tan, 2016, p. 555).
3. "A repository of information regarding the health of a subject of care in computer processable form, stored and transmitted securely, and accessible by multiple authorised users" (Garde *et al.*, 2007, p. 332).

### **2.1.3 The Significance of EHR Systems**

Before analysing the literature, it is helpful to understand the importance of and the need for an EHR system, not just from the scholarly point of view but also from the point of view of society as a whole and economically. Furthermore, it is crucial to know how the EHR system can affect and improve people's lives, as EHR system services are regarded to be a key driver of poverty reduction and socio-economic development (Findikoglu *et al.*, 2016).

First, it has been shown that healthcare spending continues to increase (Davidson *et al.*, 2018; Laukka *et al.*, 2020) and consumes the largest share of public expenditure in many countries. For example, the cost of healthcare in the US represents 19.7% of the GDP and 9.8% in the United Kingdom (UK) (Ford *et al.*, 2018). Additionally, Saudi Arabia's total healthcare GDP has risen from 8% in 2018 to more than 15% in 2022 to improve healthcare services (Singhi, 2022).

However, a notable difference between the US and the Saudi Arabia healthcare system, is that the healthcare service is free of charge; therefore, there are increasingly additional challenges in reducing costs and meeting the patient's perspectives. While in the UK, where healthcare is free since citizens pay National Insurance to cover the expenses, the healthcare system in Saudi Arabia is funded entirely by the government through the MoH; therefore, it comes at no cost to citizens (Alatawi *et al.*, 2020). Importantly, Adamson (2016) noted that the increase in healthcare costs might cause a free healthcare system to become unaffordable due to an ageing population and the global increase in

population. This could result in tremendous pressure on governments and health authorities to change their healthcare delivery system significantly.

Second, despite the massive investment and cost of healthcare provision, medical errors are increasing highlighting the need for the EHR system. For example, the IOM has indicated that nearly 98,000 people die every year in the US due to medical errors, which Makary and Daniel (2016) have reported as the third leading cause of death in the US. There are similar numbers in the UK, with the number of deaths attributed to medical errors being estimated at 85,000 per year and continuing to increase (Abernethy, 2019).

In Saudi Arabia, avoidable medical errors have increased by more than 100% from 2003 to 2013 (Ghaffar *et al.*, 2015). Researchers showed that medical errors could result from repeated examinations, wrong diagnoses, the prescription of inappropriate medications and the tendency for medical professionals to resist technological advancements (Aljadhey *et al.*, 2013; Aljarallah & AlRowaiss, 2013; Hemmat *et al.*, 2017). Therefore, the IOM has also listed the implementation of EHR as a critical solution to medical errors.

Third, even though governments have invested heavily in implementing the EHR system, the adoption rate remains low (Kruse *et al.*, 2016; Gesulga *et al.*, 2017; Laukka *et al.*, 2020; Abouzahra *et al.*, 2022). It has also been argued that technologies such as EHRs have questionable usability, and healthcare professionals continue to resist these technologies (Davidson *et al.*, 2018; Cho *et al.*, 2021; Abouzahra *et al.*, 2022). EHR can improve healthcare quality (Angst *et al.*, 2017) and reduce costs (Rivard & Lapointe, 2012; Hsieh & Lin, 2018).

According to Algahtani *et al.* (2017), implementing EHRs could reduce medical errors by 55%. A separate study by Jayaram *et al.* (2011) has shown that implementing EHRs can reduce medical errors by 87%. In addition, EHR implementation has several advantages such as improving the quality of clinical decisions, supporting the continuity of care while facilitating the exchange of up-to-date information among healthcare providers in distinct locations and reducing healthcare costs (Alghatani *et al.*, 2017).

Finally, Romanow *et al.* (2012) pointed out the relative lack of literature about EHR resistance when contrasted with the size and importance of the healthcare industry. They

argue that despite the massive increase in EHR literature since 2011, those studies have underrepresented the societal and field needs. Furthermore, gaps still need to be filled (Romanow *et al.*, 2012; Kumar *et al.*, 2020), which this study has done.

## **2.2 EHR Throughout the World**

Technological improvements within the healthcare sector have increased the complexity of the care process and made it impossible for healthcare professionals to achieve their health-related goals (Caricati *et al.*, 2016). Hence, despite the documented benefits of the EHR system (Angst & Agarwal, 2009; Angst *et al.*, 2017; Davidson *et al.*, 2018), the adoption progress is much slower worldwide than initially anticipated (Fragidis & Chatzoglou, 2018). Several factors could lead to the slow adoption of the EHR system such as financial, political and social problems (Sheikh *et al.*, 2011). Countries considered to be leading EHR implementation around the world still face challenges and low adoption rates (Fragidis & Chatzoglou, 2018). This section will discuss the experience of EHR implementation in the US, UK and Canada.

### **2.2.1 United States**

The investment in healthcare in the United States is increasing rapidly. In 2012, it had grown 3.7% to US\$ 2.8 trillion (Demirezen *et al.*, 2016). It also accounted for 19.7% of the nation's GDP in 2020. Therefore, it becomes critical to reduce costs and improve the quality of the systems (Menon *et al.*, 2000; Aron *et al.*, 2011; Demirezen *et al.*, 2016). There are multiple reasons for high healthcare spending, such as overuse and misuse of diagnostic testing and emergency department services, avoidable hospitalisation and rehospitalisation, and fragmented information infrastructure or technology supporting patient care (Demirezen *et al.*, 2016).

In 2004, President George W. Bush established a goal of implementing EHRs across the US within ten years (Ford *et al.*, 2009). However, the adoption rate of EHR is still low as more than 90% of US hospitals do not meet the specified requirements (Aldosari, 2017). To resolve this problem, President Obama signed legislation to increase the adoption of EHR among US hospitals as part of the Health Information Technology and Clinical Health

Act (HITECH)<sup>8</sup>. This legislation allowed the hospitals to receive funds from the Office of the National Coordinator (ONC) which granted US\$ 19 billion in a fund over four years to adapt and enhance the HIS infrastructure for hospitals (Burde, 2011).

A study by Jha *et al.* (2009) pointed out that only 1.5% of US hospitals have comprehensive EHRs, while 7.6% have a basic system. These numbers grew in 2014: a study from Alder-Milestien *et al.* (2015) indicated that at least 75% of US hospitals had adopted the basic EHR systems. However, while these numbers show that HITECH helped to increase the adoption of EHR in the US, “In general, it fell short of achieving its overarching goals to establish a highly effective and efficient healthcare system enabled by the advanced use of EHR” (DesRoches *et al.*, 2015, p. 48).

Thus, there are still some challenges facing hospitals. For example, challenges such as the increased cost of healthcare in the US (McGowan *et al.*, 2012; DesRoches *et al.*, 2015; Alder-Milestien *et al.*, 2017), resistance from physicians (Alder-Milestien *et al.*, 2015; Alder-Milestien *et al.*, 2017), a lack of integration and communications and appropriate staff training (DesRoches *et al.*, 2015), all of which have contributed to the low adoption of EHRs in the US.

### **2.2.2 United Kingdom**

In 2002, the National Health Service (NHS)<sup>9</sup> of Great Britain and Northern Ireland (the United Kingdom) invested and launched an ambitious programme of £11.4 billion, which aimed to change how the NHS uses information to improve the healthcare service and patient care quality (Public Accounts Committee, 2014). The NHS announced that by 2005 every person in the UK will have their information recorded electronically via EHR. However, the implementation faced challenges, hence, the timeframe was extended to

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<sup>8</sup> The Health Information Technology for Economic and Clinical Health (HITECH) Act, which was created in 2009 in the US, aimed to motivate the implementation of EHR and supporting technology in the US.

<sup>9</sup> The NHS is a public-funded organisation in the UK which delivers free or low-cost healthcare treatment; and is financially supported by the taxation of the UK's citizens. It is an example of a universal healthcare system that is also available in other countries such as Canada and Switzerland.

2023, and more than £4 billion was committed over the next 5 years to invest in the EHR (McCrorie *et al.*, 2019).

However, the adoption rate is still low, the benefits of the systems have not yet been gained and the costs are increasing (McCrorie *et al.*, 2019; Fennelly *et al.*, 2020). Therefore, scholars argued that the efficiency of EHRs have not been met; as healthcare professionals have found it time-consuming to use the system (Greenhalgh & Keen, 2013; Fennelly *et al.*, 2020). In addition, they reported that most of the communications between the NHS hospitals are still via emails or patient messenger due to resistance to not using the system properly.

Previous studies highlighted cultural factors for healthcare professionals' resistance; for example, Ser *et al.* (2014) conducted a study in an NHS hospital in London. Their study concluded that cultural factors such as a lack of computer literacy were deemed the reason for resistance to the EHR change. Sheikh *et al.* (2011) similarly implied their problems to be the lack of trust and ownership between the administration and staff, a lack of training, a change of practice which led to resistance among staff, and the lack of awareness among people about the time that is required until the system is configured.

Williams (2013) reported problems such as time wasted due to the system being slow. Also, there was the feeling that physicians could face technological barriers and feel that their communications with their patients were being threatened. Greenhalgh *et al.* (2013) noted some concerns, such as the high complexity of the programme, technical challenges and resistance from civil liberties groups. In conclusion, EHR adoption in the UK has failed to be implemented effectively and this failure is causing an economic cost (Sligo *et al.*, 2017; McCrorie *et al.*, 2019).

### **2.2.3 Canada**

The federal government in Canada established Canada Health Infoway with one aim: to accelerate the HIS agenda and create a national system of EHR (Rozenblum *et al.*, 2011). In 2001 Infoway introduced a plan to implement an EHR, with a Can\$ 1.6 billion investments, by establishing a national infrastructure that could enable the exchange of health information in the whole country (Rozenblum *et al.*, 2011). Its 2015 mandate

sought to improve patient safety by establishing a baseline EHR for each Canadian, to which every healthcare worker in Canadian hospitals can have easy and fast access (Chang & Gupta, 2015).

However, despite these promises and colossal investment, Canada continues to lag behind other Western countries such as the US and the UK (Chang & Gupta, 2015; Frigidis & Chatzoglou, 2018; Fennelly *et al.*, 2020). Many factors have been documented in the literature to explain the slow adoption. For example, Alami *et al.* (2020) pointed out that reasons for the slow adoption and resistance from healthcare professionals in Canada include anxiety and stress, and decreased contact and communication, not only with their patients, but also with their colleagues.

### **2.3 Resistance to Change and to the Use of IS**

Resistance to change is embedded in the organisational experiences of an individual (Nilsen *et al.*, 2016). As a result, resistance is difficult to avoid, especially within complex organisations like hospitals (Curtis & White, 2002). However, resistance to IS change has been acknowledged as a critical issue that often prevents organisations from obtaining the benefits of implementing IS systems (Lapointe & Rivard, 2007). Sometimes user resistance can even cause new systems to fail (Samhan & Joshi, 2015), especially if it comes from healthcare professionals, such as EHR applications (Khalifa, 2013; Kumar *et al.*, 2020). Thus, failing to address the factors contributing to resistance has been seen to result in the non-adoption or ineffective implementation of IS systems, particularly EHR applications (Umme *et al.*, 2018).

This research will be focusing on one IS application, which is EHR. Resistance to EHR has been understudied (Lapointe & Beaudry, 2014; Samhan & Joshi, 2015; Kumar *et al.*, 2020). Most people are comfortable with the status quo; therefore, individuals often resist changes that alter what they have got used to. According to Samhan (2017), implementing EHR not only changes how an organisation performs daily tasks but also changes how individuals perform their tasks in that specific organisation, which could cause resistance behaviours.

Resistance to EHR has been defined in many ways; for example, Joshi (1991) suggests that it is the users' persistence to avoid using the new EHR. Lapointe and Rivard (2005, p. 477) proposed that it delivers "an ultimatum demanding that the system is withdrawn". Marakas and Hornik (1996, p. 208) see it as "The form of overt cooperation and acceptance of the proposed system combined with covert resistance and likely sabotage of the implementation effort".

Lewin (1947) suggested that user resistance to change is due to the tendency to maintain a status quo by resisting the new situation. However, resistance is not the same as not using; resistance could be considered to lead to a lack of usage (Bhattacharjee & Hikmet, 2007). User resistance to EHR is defined in this study as the lack of use or the insistence not to use an installed EHR. Based on what we have discussed above, it is possible to suggest that healthcare professionals' resistance to EHR may be due to issues concerning their professional identity.

### **2.3.1 EHR Resistance Theories**

Researchers agree that many EHR implementations either failed or are abandoned (Kayser *et al.*, 2015; Metallo *et al.*, 2022) and user resistance is found to be the main cause of these implementation failures (Ali *et al.*, 2016; Kumar *et al.*, 2020). A significant factor in the implementation failure, which is due to user resistance, is the limited understanding of users, how they react to the system, and their needs (Metallo *et al.*, 2022; Kayser *et al.*, 2016), and the context in which they live (Kumar *et al.*, 2020; Heath *et al.*, 2022).

Therefore, IS scholars have acknowledged the importance of looking at user resistance to EHR through multiple theories and lenses, as it can help us better understand user resistance and successfully implement the system (Laumer & Eckhardt, 2012). However, when it comes to what lens researchers utilised to understand user resistance, most studies on EHR resistance used the Technology Acceptance Models (TAM) (Hwang *et al.*, 2016; Graf-Vlachy *et al.*, 2018; Metallo *et al.*, 2022), and despite other studies that used different theories, there is still little research on why or how behavioural problems of EHR resistance occur (Nach, 2015; Metallo *et al.*, 2022).

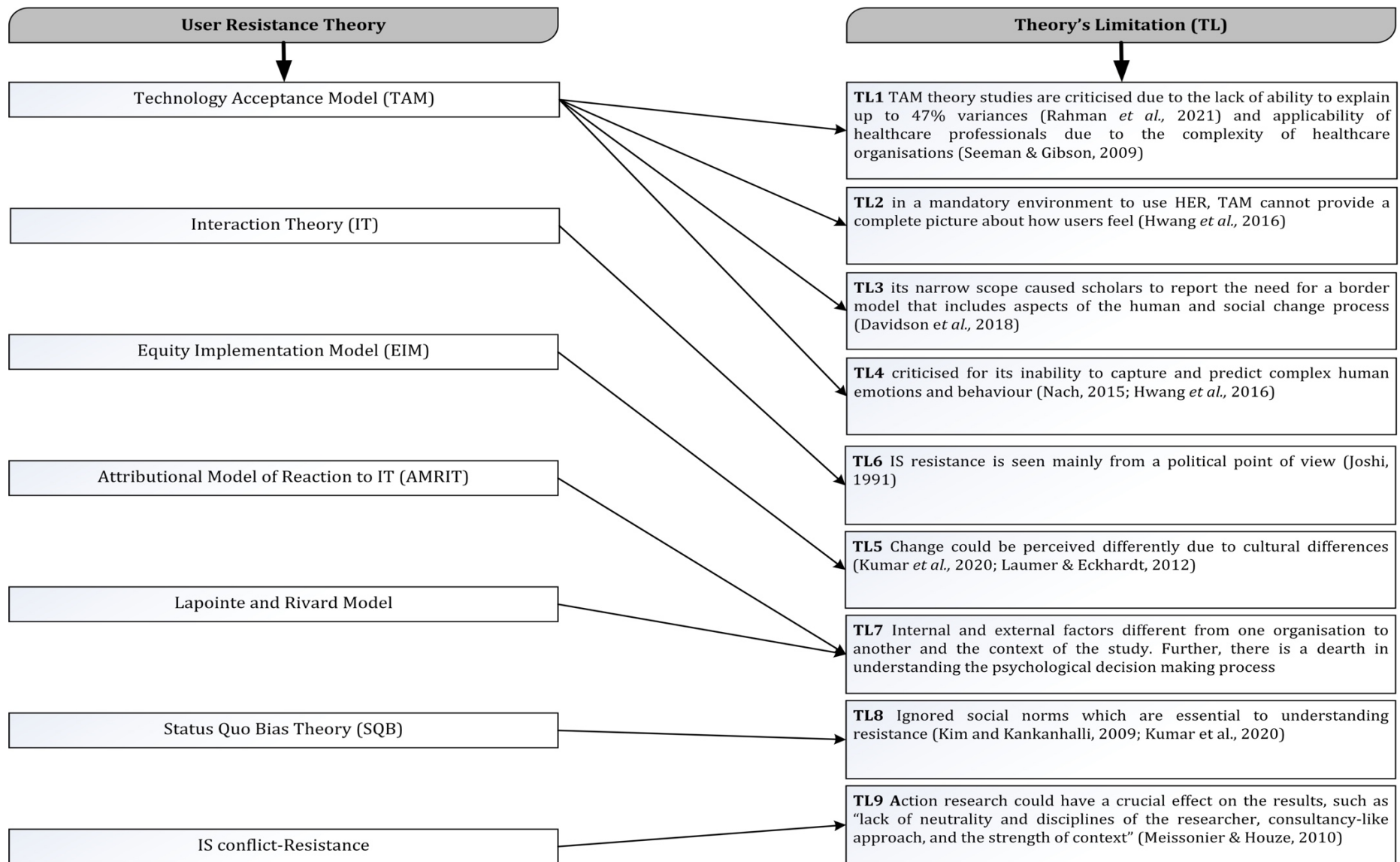


Thus, this research is interested in EHR user resistance to change in Saudi Arabia, especially Saudi healthcare professionals' resistance, with professional identity being used as a lens through which to understand the phenomenon, as it has the potential to provide us with a deep understanding of why people behave in a certain way (Brown, 2017). However, we first will identify mainly used theories to understand EHR resistance with their limitations and critically evaluate them to establish the gap in the field.

Between 1960 and 1979, researchers focused on identifying aspects that would help IS adoption and use (Legris *et al.*, 2003). Afterwards, in the late 1980s, a new practical model was proposed to predict the attitude toward IS acceptance from Davis (1989). From that point, researchers such as Joshi (1991) and Martinko *et al.* (1996) started to consider why some users engage in resistance activities. As this topic continues to date (e.g., Kumar *et al.*, 2020, Kumar *et al.*, 2021) researchers continue to propose models that could potentially improve implementation outcomes and explain the resistance as a behaviour.

Many researchers have explained and studied the concept of user resistance as they sought to explain why and how resistance happens. As a result, many theories have been proposed to explain the phenomenon (Hirschheim & Newman, 1988; Joshi, 1991; Kim & Kankanhalli, 2009; Lapointe & Rivard, 2005; Meissonier & Houze, 2010) (Figure 2.1). Therefore, this section will present the key findings and their limitations as there is a dearth of analysis concerning these factors that cause an individual's resistance to technology (Laumer & Eckhardt, 2012). Thus, given the nature of the study, this review focuses on user resistance theories and models.

For example, TAM has been proposed to explain the attitude towards accepting technology. Davis's (1989) model, TAM, has been used by many researchers (Bhattacharjee & Hikmet, 2007; Hsieh, 2016; Tsai *et al.*, 2019) and is considered the dominant theory (Graf-Vlachy *et al.*, 2018; Metallo *et al.*, 2022). TAM is used to explain why individuals accept or reject technology (Seeman & Gibson, 2009). Therefore, Bhattacharjee and Hikmet (2007) proposed that drawing from resistance to change literature and the TAM model would assist researchers in better understanding why individuals resist using technologies.



**Figure 2. 1** Diagram summarising user resistance theory limitation

The dominance of the TAM in the IS literature is clear (Hwang *et al.*, 2016). However, when using TAM with regard to EHR resistance, there is a lack of explanation (Rahman *et al.*, 2021), and its application to medical practitioners may not be appropriate due to the complexity of healthcare organisations (Seeman & Gibson, 2009). Also, as the EHR system usage is considered mandatory, TAM theory cannot provide a complete picture and genuinely represent how the users feel (Hwang *et al.*, 2016).

Additionally, many researchers criticised this narrow scope and reported the need for a broader model that includes aspects of the human and social change process (Davidson *et al.*, 2018). Aujubade (2018, p. 1) stated that the TAM theory is not appropriate to explain a corporate or institutional application that requires “integration of information technology”. Graf-Vlachy *et al.* (2018) have also criticised the TAM for not having the ability to capture a deep understanding of social influence and technology. TAM theories are also criticised for their limitation and difficulties in capturing and predicting human behaviour and complex human emotions (Nach, 2015), together with ignoring a critical issue in IS; that is, considering the context of the implemented IS (Hwang *et al.*, 2016).

Moreover, in her article, Markus (1983) proposed interaction theory to explain user resistance. She argued that a group of actors would use the technology if they believed it would support their position of power while resisting it if it leads to the opposite. Joshi, (1991) argued that Markus’s (1983) model has a limitation as it sees resistance mainly from a political point of view. Hence, Joshi (1991) proposed the Equity Implementation Model (EIM) and identified three levels of change evaluation: first, assessing change in terms of gain and loss; second, comparing outcomes with what is in the organisation; and finally, comparing results with others in the organisation.

However, according to Joshi (1991) “The nature of changes may make it difficult for users to make an objective assessment” (p. 240). Furthermore, change is perceived differently not only because of cultural differences (Kumar *et al.*, 2020), but also individually, and both need to be investigated (Laumer & Eckhardt, 2012). To illustrate this, for Saudi Arabian healthcare professionals, change to EHR could be perceived differently than it might be by US healthcare professionals.

In addition, Martinko *et al.* (1996) proposed the attributional model of reactions to IT (AMRIT); their model is drawn from the attribution theory. They proposed that the individual's level of interaction with new EHR systems is based on external and internal factors, suggesting that it may directly affect EHR usage (Ali *et al.*, 2016). However, those internal and external factors depend on the organisation's settings and may vary from one organisation to another and from one country to another.

Therefore, Lapointe and Rivard (2005) proposed their own model after addressing the limited research focusing on resistance. Their model was developed to explain the multi-dimensional resistance to IS implementation, arguing that the previous models only looked at resistance on one organisational level instead of examining many different levels of an organisation. Their model identified resistance behaviours, objects of resistance, perceived threats, initial conditions and the subject of resistance. Still, their research results cannot be generalised due to the context of the study, and they have also suggested the need to specifically identify the group of actors for any future studies (Lapointe & Rivard, 2005).

Another theory used to explain resistance is Status Quo Bias (SQB) theory. Kim and Kankanhalli (2009) proposed it to explain resistance, which could arguably be included in the ranks of a limited number of theoretical models of resistance to information technology (Davidson *et al.*, 2018). They acknowledge the gap in the literature for understanding how "Users evaluate change related to a new information system and decide to resist it" via the status quo, which means that user resistance is due to the need to stay within their current situation (p. 567). Their study highlighted the importance of switching costs as a cause for resistance by testing their model within the context of a newly implemented system. However, the study lacked robustness due to data collection being from a single organisation, which cannot be generalised. Additionally, it ignored the social norms, which are essential to understanding resistance (Kim & Kankanhalli, 2009; Kumar *et al.*, 2020; Metallo *et al.*, 2022). The authors themselves also noted that their study cannot be generalised, as every context is unique.

Hsieh (2015) used the SQB theory to claim that perceived threat, inertia, cost and avoidance of regret are the primary sources of resistance to cloud computing. However, the study does not discover the reason behind physicians' resistance, and it has been

argued that other aspects could explain their resistance aside from those mentioned (Hsieh, 2015). Critics such as Pope and Mays (2000), Mack (2005) and Forchuk and Roberts (1993) have argued that surveys are not a sufficient tool when it comes to understanding behaviour and answering “why” and “how” questions.

Another theory proposed by Meissonier and Houze (2010) is the IS conflict-resistance theory. They situated their research within a pre-implementation context and used the framework as a basis for two years of an action research project. They argued that resistance to IS is part of the IS implementation process, and the managers' avoidance of employees' resistance to IS will motivate team members to cope with the new technology. Thus, the authors suggest that the enhancement of resistance occurred in the IS pre-implementation phase instead of maximising user satisfaction, as has been proposed in most prior research.

However, Meissonier and Houze (2010) reposted the socio-political factors as a salient determinant of conflict and resistance. Moreover, the authors criticised action research because it could have a crucial effect on the results, such as a “lack of neutrality and disciplines of the researcher, a consultancy-like approach, and the strength of context” (Meissonier & Houze, 2010, p. 554). Eden and Huxam (1996) also mentioned that a consultancy-like approach could have an impact on the rigorousness of the research. Hence, our research used in-depth semi-structured interviews to obtain more detailed information due to its interactive nature (Ritchie *et al.*, 2013).

### **2.3.2 Factors Leading to IS Resistance**

After highlighting the lens used to understand user resistance to IS and their limitation, it is important now to discuss the IS resistance literature factors. This is because in order to reveal the research gaps in the EHR resistance, it is important to first uncover resistance factors from the wide IS to resistance to change literature (Table 2.1), afterwards, format it in the context of healthcare (Samhan & Joshi, 2015). In terms of factors that contribute to resistance, the literature highlighted many reasons which could contribute to IS resistance. As such, the next paragraphs will summarise some of the main literature factors to the IS resistance to change.

For example, many studies have examined the role of **social influence** (e.g., Dwivedi *et al.*, 2014; Boudreau *et al.*, 2014; Lukkanen, 2016; Leong *et al.*, 2020). Social influence can be referred to as, the degree to which an individual sees the importance of others' opinions in using specific technology (Samhan, 2017). For instance, Boudreau *et al.* (2014) conducted to investigate a librarian group's perception of an implemented IS system. The study concluded that social influence such as other people's perception of the IS system user can influence the utilisation of the system.

<b>Wide IS Resistance Literature Factors</b>	<b>Sources</b>
Social Influence	Dwivedi <i>et al.</i> (2014); Boudreau <i>et al.</i> (2014); Lukkanen (2016), Leong <i>et al.</i> (2020)
Uncertainty	Kim (2011); Alhirz and Sajeev (2015); Ali <i>et al.</i> (2016)
Privacy Concerns	Anderson & Agarwal (2011); Angst and Agarwal (2009); Samsuri and Ismail (2013); Morosan and DeFranco (2015); Tasi <i>et al.</i> (2020)
System Integration	O'Malley <i>et al.</i> (2015); Gagnon <i>et al.</i> (2016); Heponiemi <i>et al.</i> (2017); Upadhyay and Hu (2022); Tsai <i>et al.</i> (2022)
Information Quality	Alohali <i>et al.</i> (2020); Serrano <i>et al.</i> (2020); Upadhyay and Hu (2022)
User Interface Design	Khanum <i>et al.</i> (2012); Scholtz <i>et al.</i> (2016); Alsswey <i>et al.</i> (2018); Draus <i>et al.</i> (2019)
Training	Hamid and Cline (2013); DesRoches <i>et al.</i> (2015); Wong <i>et al.</i> (2016); Maher <i>et al.</i> (2016)
Management and Staff Support	McAlearney <i>et al.</i> (2014); Dugstad <i>et al.</i> (2019); Laukka <i>et al.</i> (2020); Upadhyay and Hu (2022)
Control	Mishra <i>et al.</i> (2012); Klöcker <i>et al.</i> (2014)

**Table 2. 1** Factor leading to IS resistance from previous literature.

Another study by Lukkanen (2016) aimed to investigate the predictor of users' adoption or resistance of banking applications. His study concluded that social influence has a vital role to play in whether to use or resist the system. Further, Abubakre *et al.* (2016) conducted a study aiming to explore and investigate the role of culture in IS successful implementation in a Nigerian Bank. Their study concluded that two factors influenced users' perception and lead to resistance behaviour, those who are confused and

complaining. Leong *et al.* (2020)'s study was on mobile wallet resistance and argued that social influence plays a major role to resist the application.

**Uncertainty** is another factor which has been observed by scholars and associated with IS resistance in the literature (e.g., Kim, 2011; Alhirz & Sajeev, 2015; Ali *et al.*, 2016). Uncertainty refers to the uncomfortable feeling of an unstructured situation (Hofstede, 2001). To elaborate, in his study to investigate user resistance to an enterprise system implementation, Kim (2011) concluded that uncertainty cost and sunk cost directly cause resistance behaviour. Alhirz and Sajeev (2015) conducted a study to examine the influence of the national culture of individuals on user acceptance of enterprise resource planning (ERP) in the ME countries. Their study concluded that uncertainty does not have a role in users' resistance to the ERP system.

**Privacy** concerns have also been recognised in the IS resistance to change literature (e.g., Anderson & Agarwal, 2011; Angst & Agarwal, 2009; Samsuri & Ismail, 2013; Morosan & DeFranco, 2015; Tasi *et al.*, 2020). For instance, a study by Angst and Agarwal (2009) examined whether individuals can disclose their information in an EHR system. They concluded that privacy calculus (i.e., considering the future consequence of leaked information) plays a major role to resist the system.

A similar study was done by Anderson and Agarwal (2011) to understand the circumstances of individuals disclosing their personal information in a HIS system. Their conclusion found that type of information and negative emotions play major roles in HIS use. Another study by Samsuri and Ismail (2013) found that Malaysian healthcare professionals are open to sharing patients' information with their relatives and trust the government with their medical information.

In addition, Morosan and DeFranco (2015) conducted a study which aimed to explain users' perception of using hotel applications to disclose personal information. Their study found that privacy has no role if that information will benefit them. Tasi *et al.* (2020) conducted a study to understand physicians' perceptions about the HIS system and found that privacy concerns are not factors to resist the implemented HIS system.

Furthermore, **systems integration** is another factor for IS resistance to change among users, because the inability to share information could cause resistance behaviour. For example, when it comes to health information related to the patient, the inability to share such information with other professionals has been among the stressful guidance to healthcare professionals (Heponiemi *et al.*, 2017). Many scholars identified system integration as an important factor of user resistance (e.g., O'Malley *et al.*, 2015; Gagnon *et al.*, 2016; Heponiemi *et al.*, 2017; Upadhyay & Hu, 2022; Tsai *et al.*, 2022).

For instance, in their study which sought to identify how EHR cause challenges to primary care teams, O'Malley *et al.* (2015)'s study has also reported that a lack of integration with the EHR system causes physicians not to use the implemented system. A similar study by Gagnon *et al.* (2016) to identify individual and organisational factors which could explain physicians' intention to use EHR in Canada. The study concluded that access to information influences the use of EHR systems.

Additionally, in their study which aimed to examine the 9-year longitudinal development of HIS levels among Finnish physicians. Heponiemi *et al.* (2017) argued that poor integration of the system would probably encourage users to resist the implemented IS system. A more recent study by Tsai *et al.* (2022) was conducted to understand users' intention to utilise telehealth. Their study concluded that timely accessed information which is provided by the system's integration can influence the system's adoption. A seminal study by Upadhyay and Hu (2022) also concluded that EHR integration had been perceived as an essential aspect of EHR.

**Information quality** has also been among the factors which contribute to IS resistance to change behaviour (e.g., Alohali *et al.*, 2020; Serrano *et al.*, 2020; Upadhyay & Hu, 2022). To illustrate, Alohali *et al.* (2020) conducted a study to investigate the antecedents of a perceived threat to HIS by physicians and nurses. Their study concluded that information quality can influence system resistance. Additionally, in their study to identify the barriers to the deployment of home-based telemedicine systems for chronically ill patient. Serrano *et al.* (2020)'s study concluded that data accuracy is one of the barriers for the system to succeed. Finally, in their study to explore the lived experience of clinicians to assess the role of EHR in improving the quality and safety of healthcare



services. Upadhyay and Hu (2022) concluded that information quality is a vital factor for users to resist the system.

**The user interface design** has also been recognised as one of the important factors of user resistance to an implemented IS system (e.g., Khanum *et al.*, 2012; Scholtz *et al.*, 2016; Alsswey *et al.*, 2018; Draus *et al.*, 2019). For example, Khanum *et al.* (2012) conducted a study to examine how culture impacts how people from Arabic countries perceive website interfaces and whether it impacts their cultural values. Their study concluded that interface design has a considerable impact. Moreover, in their paper aimed to investigate the impact of interface usability on end users' attitudes and behaviour towards the implemented ERP system. Scholtz *et al.* (2016)'s findings argued that interface usability has a significant impact on users' perceptions and will eventually affect the attitude and intentions of the users to use the system.

Further, Alsswey *et al.* (2018) conducted a study to investigate the acceptance of a mobile health application user-interface designed for elderly Arab users based on their culture. Their result concluded that users found the application is acceptable due to its culturally-based design. A further recent study by Draus *et al.* (2019)'s aimed to understand the factors influencing healthcare professionals' perception of EHR. Their study concluded that system design is a key factor for healthcare professionals' perception of the system.

**Training** has also been recognised in the literature to cause IS resistance (e.g., Hamid & Cline, 2013; DesRoches *et al.*, 2015; Wong *et al.*, 2016; Maher *et al.*, 2016). For example, Hamid and Cline (2013) conducted a study to explore the barriers associated with healthcare professionals' intention to adopt EHR. Their study concluded that management support for training, resolving technical issues, and provider involvement are the factors most strongly associated with EHR adoption. Another study by DesRoches *et al.* (2015) concluded that lack of training to IS systems can increase resistance from users. Finally, in their study to investigate the features of the ERP system in Bangladesh that would encourage or discourage users to engage the system. Wong *et al.* (2016) found that a lack of proper training will affect the system's usability.

**Management and Staff support** have been identified by many scholars as a factor for IS resistance to change, and how critical it is for the success or failure of the implemented

system (e.g., McAlearney *et al.*, 2014; Dugstad *et al.*, 2019; Laukka *et al.*, 2020; Upadhyay & Hu, 2022). For example, McAlearney *et al.* (2014) conducted a study to examine what was the best practice at a hospital in the USA that helped EHR implementation. Their study concluded that management support for healthcare professionals is a critical factor for EHR implementation.

Another study by Dugstad *et al.* (2019) concluded that staff support for IS implementation is regarded to be a vital sign for the success or failure of the system. Further, in their scoping review to identify the role of healthcare leaders in HIS implementation, Laukka *et al.* (2020) argued that leaders' support plays a major role in HIS successful implementation. Finally, Upadhyay and Hu's (2022) study which was discussed earlier concluded that staff support is an important factor in EHR resistance.

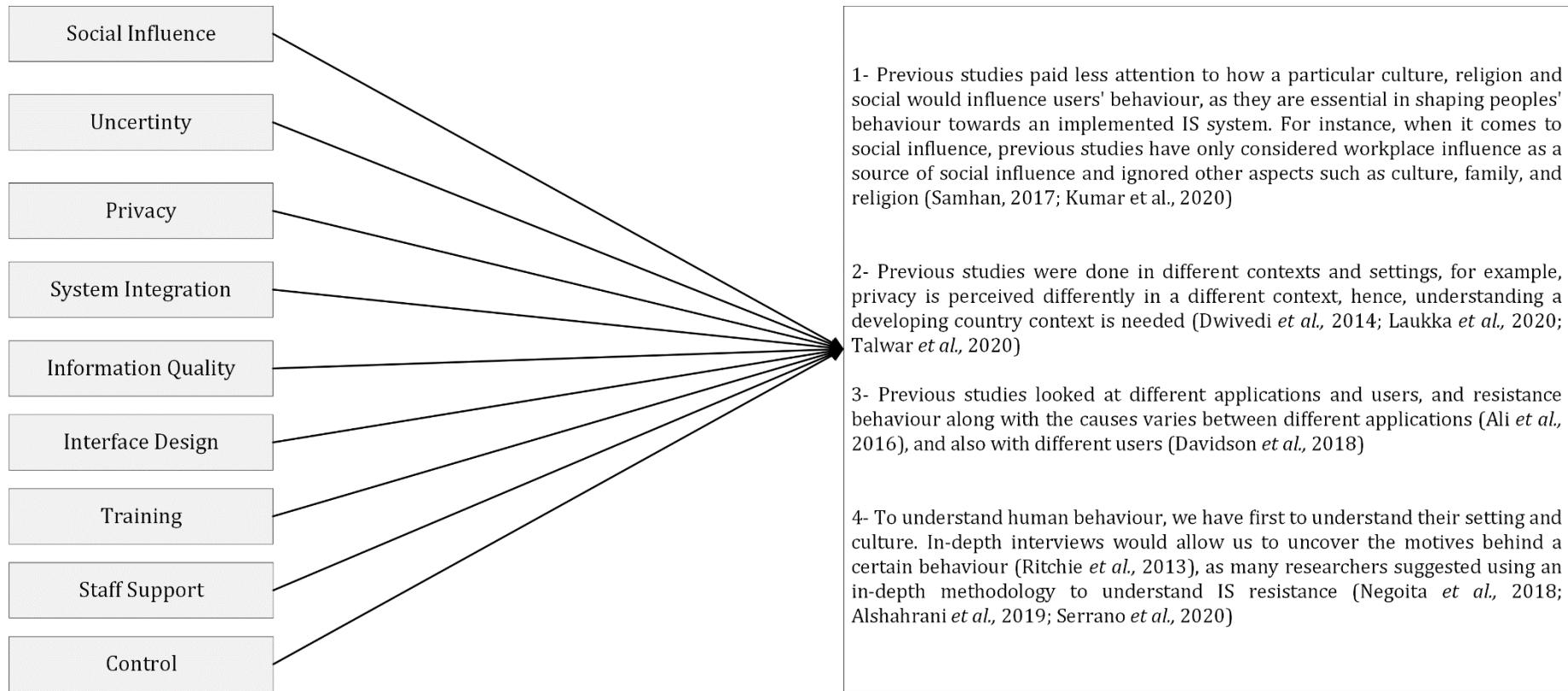
**Control** is a further factor which has been identified in the IS literature and can contribute to IS resistance (e.g., Mishra *et al.*, 2012; Klöcker *et al.*, 2014). For instance, Mishra *et al.* (2012) conducted a study to examine how identity would influence users to resist an implemented IS system, and similarly, Klöcker *et al.* (2014) conducted a study aimed to measure the influence of institutional control on individual user resistance. Both studies argued that institutional pressure and control over users could influence the IS users to use/resist the system.

However, taken as a group (Figure 2.2), despite the valuable insights that previous research has given us, it has paid less attention to how a particular culture, religion and society would influence users' behaviour (Albarrak *et al.*, 2021; Weber *et al.*, 2017). Considering those factors is essential as several studies suggested that fundamental human beliefs, values and behaviour vary significantly across societies, even among professions (Davidson & Martinsons, 2016), which is why researchers suggested studying another context (i.e., Ali *et al.*, 2016; Gagnon *et al.*, 2016; Leong *et al.*, 2020).

This is because many of the above studies have been done in different contexts, and settings (i.e., Leong *et al.*, 2020; Anderson & Agarwal, 2011; Gagnon *et al.*, 2016; Tasi *et al.*, 2022). Yet, contextual aspects are important, because it shapes people's behaviour and eventually, the IS use (Dwivedi *et al.*, 2014; Kumar *et al.*, 2020), particularly, in Saudi

**IS Literature Resistance Factors**

**Previous IS Resistance Literature Gaps and Limitations**



**Figure 2. 2** Summary of the factors that leads to IS resistance in the literature and its limitations

Arabia (Alzahrani *et al.*, 2020; Alanezi, 2021) due to its unique context that has a strong cultural and religious background. For example, studies on privacy have not considered the contextual differences, as privacy concerns can vary between countries (Romanow *et al.*, 2012). Thus, what literature is lacking is for instance, 'why' privacy is important and 'how' it can cause resistance?

Hence, to better understand resistance behaviour and the cause of this behaviour, it is vital to understand people's social, cultural, and religious beliefs (Kumar *et al.*, 2020; Ogbanufe, 2020). Further, more research is needed on understanding in-depth how/why healthcare professionals resist the implemented EHR system, and their role in the system resistance (Laukka *et al.*, 2020; Talwar *et al.*, 2020). Serrano *et al.* (2020) have also stressed the importance of investigating human relationship roles in IS resistance.

Furthermore, it is also important to understand how system design can influence resistance in multiple cultures (Upadhyay & Hu, 2022), as within different settings, people's perspectives of the implemented system and behaviour differ (Alsswey *et al.*, 2018; Kumar *et al.*, 2020). Therefore, our research aims to understand the contextual factors which lead to healthcare professionals' resistance to EHR change. Further, we will be investigating in-depth these contextual factors, and how it motivates users to behave in this way.

In addition, these previous studies mostly looked at different applications, where; generally, resistance behaviour does not cause risk to people's life (e.g., Lukkanen, 2016; Alhirz & Sajeev, 2015; Morosan & DeFranco, 2015; Alsswey *et al.*, 2018). Our study will be focusing on healthcare professionals as the main users of the EHR system, as their role is essential for the system to be succeeded, and due to their differences from other IS users (Davidson *et al.*, 2018). This is because resistance behaviour and the cause of resistance vary among different groups, as several studies suggested that fundamental human beliefs, values and behaviour (Samhan & Joshi, 2015; Kumar *et al.*, 2020), and also from system to system (Dwivedi *et al.*, 2014; Ali *et al.*, 2016). Thus, our study aims to understand healthcare professionals' perspective, and the cause of EHR systems' resistance to change behaviour.

Moreover, understanding human behaviour would not be achieved if a quantitative approach were taken (Ritchie *et al.*, 2013). Hence, since we are aiming to uncover the hidden motives regarding resistance to change behaviour, a qualitative in-depth methodology is suitable for this research (see Chapter 4), as most of the previous research in healthcare followed the quantitative approach (Serrano *et al.*, 2020) (i.e., Tasi *et al.*, 2022; Chen *et al.*, 2021; Scholtz *et al.*, 2016; Gagnon *et al.*, 2016). Therefore, by doing so, we will be answering multiple calls from authors to utilise qualitative research to motives behind individuals' behaviour as deep insights typically generated by qualitative methods (Aljarullah *et al.*, 2017; Negoita *et al.*, 2018; Serrano *et al.*, 2020).

## 2.4 Identity Theory

By acknowledging the previous research limitation, our research proposes identity theory to understand EHR resistance to change. The notion of identity has received extensive research attention across social science resulting in considerable variation in its conceptual meaning (Stryker & Burke, 2000; Nach & Lejeune, 2010; Touati *et al.*, 2019). Nevertheless, identity theory is still under-explored (Brown, 2017). This sustained interest is based on the importance of "Understanding individuals as situated in social interaction and embedded within society" (Stets & Serpe, 2013, p. 31). This theory exposed people's need to have a social psychological demand to belong and express this need via their social identity (Jesse & Williams, 2005; Nach, 2015).

Identity has been defined in multiple ways, for example, some explain identity as the culture of people (Stryker & Burke, 2000). In contrast, others use identity to refer to common identification with a collective or social category, as in social identity theory (Tajfel, 1982)<sup>10</sup>. Some refer to identity in the same way we do in this research: a set of self-relevant meanings<sup>11</sup> that guide an individual's attitude and behaviours (Burke & Stets, 2009; Stets & Burke, 2000). This theory explains people's social and psychological need to belong, expressing these needs via social identity (Jesse & Williams, 2005).

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<sup>10</sup> In this research social identity theory is on a different level from identity theory, which will be explained in the next paragraph.

<sup>11</sup> Meanings are "the individuals' responses when they reflect upon themselves in a role, social or person identity" (Stets & Serpe, 2013, p. 34).

Identity theory and social identity theory (SIT) are "self-reflexive, which means that the person will categorise him/herself in a specific way in relation to others' social categories or classifications" (Stets & Burke, 2000, p. 224). Thus, using identity theory could provide answers to questions regarding individual identities as well as group, organisational and social identities (Ashforth *et al.*, 2008). However, there are many differences between those two theories (Stets & Burke, 2000).

At the individual level, identity is the answer to the "Who am I?" question. Identity theories at this level include, for example, identity theory (Stryker, 1980), role-identity (McCall & Simmons, 1978) and personal identity. Identity theory could be defined as how an individual perceives themselves as different from others (Stryker & Burke, 2000). At the same time, role-identity means acting in a certain way to fulfil the expectation of that specific role (Stets & Burke, 2000). Person identity refers to "recognised characteristics, values and norms that individuals choose to define themselves as a distinct entity" (Carter & Grover, 2015, p. 933).

At the collective level, it is the answer to "Who are we?" and is called SIT (Ashforth *et al.*, 2008). Abrams and Hogg (2006) defined SIT as how a person knows they belong to a particular group or a social category. Therefore, SIT deals with intergroup relations, which are how people see themselves as a member of a specific group (Abrams & Hogg, 2006). In addition, social categories include individuals sharing a common social identity view of themselves as a member of the social category (Stets & Burke, 2000) such as physicians as a professional group.

Hogg *et al.* (1995, p. 255) have pointed out that SIT is "A social psychological theory that sets out to explain group processes and intergroup relations". SIT has been used in many fields such as psychology, political science, business and management, and healthcare. Kreindler *et al.* (2012) stated that SIT provides a good framework for explaining the problems with implementing new technology in the healthcare sector.

Stets and Burke (2000) highlighted an essential process of those two theories, which is self-categorisation, but each theory has a different approach. For example, identity theory proposes that individuals categorise themselves by their role in society, while SIT suggests that the self-categorisation of oneself is associated with a specific group.

Therefore, the result of self-categorisation is associating meanings and expectations based on the role or the group membership of the individual (Stets & Burke, 2000). This self-categorisation is an essential tool for maintaining one's self-perception and enhancing one's self-evaluation ability (Reychav *et al.*, 2019).

### **2.4.1 Professional Identity**

Defining what it means to be a professional is not easy, nor has it been standardised (Fitzgerald, 2020). Many researchers have tried to describe the characteristics of professionals, which are generally consistent across six features, those are: "Commitment to society and clients, a specialised body of knowledge, a specialised and unique set of skills, the ability to make judgments with integrity in environments of uncertainty, growing new bodies of knowledge through experience, and a community of professionals who perform oversight and monitoring of professional practice" (Fitzgerald, 2020, p. 447). Professionals' characterisation gives them a sense of who they are and their importance in society.

Furthermore, professional identity has been defined in many ways. For instance, it is seen as beliefs and values that people adhere to, in order to define and affiliate themselves into a certain specialised group (Slay & Smith, 2011). Banner *et al.* (2010) described professional identity as the formation and acquisition of professional values. However, in this study, we have adapted Chreim *et al.*'s (2007) definition of professional identity, which can be described as "an individual's self-definition as a member of a profession" (p. 1517). According to Pratt *et al.* (2006), a profession is defined as a group of people, such as physicians and lawyers, who have economically beneficial skills when applied to people's problems. Therefore, due to their unique knowledge, society grants professionals a higher level of prestige and autonomy than it grants to non-professionals (Pratt *et al.*, 2006; Fitzgerald, 2020).

Professionals gain their professional autonomy and prestige from society. In exchange, they perform services to the community through their professional action (Kyratsis *et al.*, 2017; Fitzgerald, 2020) which no others can execute. Hence, professionals acquire a unique and complex body of knowledge that could not be easily understood by those outside the profession (Fitzgerald, 2014). Therefore, due to their acquisition of a high

level of expertise and development of relevant medical skills, healthcare professionals, particularly physicians and nurses, see themselves as professionals (Goldie, 2012).

Hence, an individual's professional identity is vital, as it is a way for individuals to assign meaning to themselves, shaping their work attitudes, and behaviour (Caza & Creary, 2016). This is because career success is often associated with a successful professional identity (Slay & Smith, 2011). Thus, to remain successful professionals strive to maintain their profession's features (Hotho, 2008) such as status, image and prestige, as the product of professional recognition (Oen & Cooper, 1988). Professionals very strongly seek these products due to them being the major factors contributing to individual self-worth and to the survival and viability of professions (Oen & Cooper, 1988, p. 355). Therefore, as professional identity confers on them societal status and eminence, any threat to their professional identity is met with resistance.

#### **2.4.2 EHR Stakeholders' Professional Identity**

Physicians and nurses are considered the primary users of the EHR system. However, each of them has a professional identity, and they consider professional identity a critical part of a profession. However, even though both healthcare professionals' (physicians and nurses) professional identities might look similar to the outsider, they are vastly different in detail. For example, the relationship between physicians and nurses is hierarchical (Hojat *et al.*, 2003; Lotan, 2019; Van Der Cingel *et al.*, 2021), where physicians have influence over nurses. This illustrates the power differences between the two healthcare professionals.<sup>12</sup> (Green & Makoul, 2009).

Professional identity is not what healthcare professionals do as a job but what they represent and the characteristics they show and believe in (Van Der Cingel *et al.*, 2021). However, physicians and nurses share the ability to provide medical treatment and healthcare, and some of the characteristics such as values, beliefs and ethics (Fitzgerald, 2020) are highly valued and bring status with them (Van Der Cingel *et al.*, 2021).

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<sup>12</sup> To read more about studies illustrating what professional identity is for physicians and nurses, and what patients' think of the quality of physicians and nurses, please refer to (Green & Makoul, 2009; ANA, 2022; Project of the ABIM Foundation, 2002).



However, these values are different and could be interpreted differently by healthcare professionals.

Physicians and nurses are essential in healthcare services as both are involved in managing the healthcare process and their collaboration improves patient care quality (Caricati *et al.*, 2015). Further, their social context could largely shape both professional identities (Hojat *et al.*, 2003; Wyatt *et al.*, 2020). Hence, this section will outline, define and discuss the individual roles of their professional identity, how it has been developed during their medical education, and why it is crucial to be understood.

## **Physicians**

Physicians' professional identity has been described as how individuals define themselves according to their beliefs, values and experience (Tang & Guan 2018). Another definition of a physicians' professional identity is the profession's values, norms and beliefs, which must be committed to and internalised (Fitzgerald, 2020). The American Board of Internal Medicine (ABIM) defined physicians' professional identity as "emphasises professionalism encompasses both the physicians' personal commitment to the welfare of their patients and the collective efforts to improve the healthcare system for the welfare of society" (Olive & Abercrombie, 2017, p. 101).

However, in this research, we have adapted Forouzadeh *et al.*'s (2018) definition, which is "how an individual", and in our case, a Saudi individual, "perceives himself as a physician". Physicians' professional identity has been created over a long period of education, professional training (Olive & Abercrombie, 2017; Tang & Guan, 2018) and interactions with their peers, which has resulted in their strong resistance to change (Tang & Guan, 2018).

Physicians' professional identities are fixed, with solid and well-defined characteristics, power and dominance (Fitzgerald & Teal, 2004). Further core characteristics of physicians are competency, clinical knowledge and skills, good communication skills and ethics (Mueller, 2015); hence, these values are considered essential to physicians' professional identity. For example, due to their influence, physicians and nurses have a

hierarchical relationship (Hojat *et al.*, 2003), where physicians have the power to delegate work to nurses, but not the other way around (Van Der Cingel *et al.*, 2021).

In addition, one of the most critical differences between physicians and nurses is that physicians have an undisputed authority in patient care compared to nurses (Caricati *et al.*, 2015; Lotan, 2019; Mahboube *et al.*, 2019), especially in Saudi Arabia (Al-Eraky *et al.*, 2014). Moreover, physicians also enjoy more medical practice awareness than nurses (Chiu *et al.*, 2010). This might be due to the long seven years of medical education in Saudi Arabia (Al-Shafei *et al.*, 2019) and the acute shortage of physicians in the country (Telmesani *et al.*, 2011).

Moreover, in Saudi Arabia, the medical school faces high demand from high-school graduates (Telmesani *et al.*, 2011), while Saudi universities have a limited capacity to take students due to the free education system. Hence, medical school admission in Saudi Arabia is very competitive (Telmesani *et al.*, 2011), which makes the accepted student feel obligated to do their best to keep up with expectations, and makes them feel as an elite student. Therefore, this will significantly influence their professional identity during their medical education phase.

Furthermore, medical students enter the field of medicine with an already established identity, strive to obtain a physician's identity, and join the clinical medicine community (Forouzadeh *et al.*, 2018). In addition, during their education period, they are being taught that they must have both the necessary skills and knowledge so that they can think, act and feel like a physician (Cruess *et al.*, 2015; Olive & Abercrombie, 2017; Wyatt *et al.*, 2020) for them to have a solid professional identity.

Therefore, physicians see themselves as a professional who already has an established higher-status group than nurses (Caricati *et al.*, 2015). This is because physicians mostly have the most significant knowledge and needed skills (Mueller, 2015; Fitzgerald, 2020) resulting in giving them the ability to make decisions (Leuter *et al.*, 2018) without nurses' interference or even consultation (Mahboube *et al.*, 2019). Hence, this made it essential for them as a physician to protect their identity because it adds significant value to their professional identity, a matter of skills that is not available in any category of other healthcare professionals.

Moreover, physicians have a strong opinion about themselves compared to other healthcare professionals. For example, Fitzgerald (2020, p. 468) reported that physicians could define not only “who they are, but also, who they are not”. Hence, their professional identity is distinguished from other healthcare professional groups (Fitzgerald, 2020). This shows confidence in how they perceive themselves and what they would do to protect this unique professional identity.

Physicians are also obligated to protect and respect patients’ confidentiality (Project of the ABIM Foundation *et al.*, 2002) as one of their professional values and ethics. Hence, physicians do not feel obligated even to share patients’ information with nurses since they are aware of their power and dominance over them (Hojat *et al.*, 2003). Physicians also have a high ethical standard as a profession, reflecting on their professional identity (Leuter *et al.*, 2018). However, this is not saying that nurses do not have professional ethics; we are only saying that physicians have been more exposed to ethical education than nurses due to their long medical education. Hence, this could influence their decisions during their professional work.

## **Nurses**

Nurses also have a professional identity, however, it is different to that of physicians, and it is viewed as an integral and important part of their self-perception as a nurse (Öhlén & Segesten, 1998). A nurse’s professional identity depends on the development of the existence of a nurse’s personal identity, as the main requirement for developing a professional identity (Öhlén & Segesten, 1998). Nurses’ professional identity includes a caring and supportive attitude, which is vital because care is a nurse's core professional identity (Von Dietze & Orb, 2000; Van Der Cingel *et al.*, 2021).

Furthermore, many researchers tried to identify the main characteristics of the professional identity of a nurse. Compassion, competence and commitment are the most significant attributes of caring corresponding to the image of the professional nurse (Öhlén & Segesten, 1998; Von Dietze & Orb, 2000) along with being kind to patients (Van Der Cingel *et al.*, 2021). However, compassion and courage are the characteristics of an excellent nurse (Jenses *et al.*, 1993). Further characteristics of a nurse are self-knowledge,

curiosity, generosity, tolerance of stress, professional knowledge and trust in one's capacity and feelings (Öhlén & Segesten, 1998).

However, the most prominent feature is the feeling of being a nurse, which means having the sense of being an individual who can practise nursing with skill and responsibility (Öhlén & Segesten, 1998, p. 721). Therefore, nurses' professional identity is defined as the "Commonality of the nursing profession and the special way the nurse utilises this commonality within the nursing profession" (Öhlén & Segesten, 1998, p. 721).

The importance of having a feeling of being a nurse comes from being a compassionate person (Van Der Cingel *et al.*, 2021). Hence, most nurses make their career choices out of compassion (Van Der Cingel *et al.*, 2021) and being a caring person (Adamson & Dewar, 2015), which is different to physicians. Therefore, compassion is an emotion that motivates most nurses to enter the profession (Van Der Cingel *et al.*, 2021). Thus, nurses see themselves as helpful, kind and understanding people (Lotan, 2019). Consequently, they might consider leaving the profession if they cannot put these values into practice (Nijboer & Cingel, 2018).

However, unlike physicians, nurses generally do not have a significant influence on healthcare policies or the power to change their own practices. Nor are they paid as generously as physicians (Harmer, 2010; Van Der Cingel *et al.*, 2021). Differences between nurses and physicians in Saudi Arabia come from the education period. Nurses study for four academic years with one year as an internship trainee (Aljohani, 2020); this might decrease confidence in front of physicians who study for longer.

In addition, historically nurses are seen as physicians' assistants (Harmer, 2010; Migotto *et al.*, 2019). This is mostly true, especially in the Middle Eastern (ME) culture, where nurses are perceived as physicians' handmaidens (Hojat *et al.*, 2003), which gives physicians a dominant role over nurses. Further, nurses are expected to respect physicians, they do not diagnose patients nor recommend treatment, and any disagreement by nurses is "totally unacceptable" (Lotan, 2019). This shows a big difference between the two professional identities.

Moreover, nurses need autonomy over their work, which, unlike physicians, they currently do not have (Mahboube *et al.*, 2019). This is due to the fact when nurses have more autonomy and work in teams, the quality-of-care standards are higher than those who do not have autonomy over their work (Van Der Cingel *et al.*, 2021). Professional development is viewed as key for nurses to increase their self-esteem (Mannahan, 1989). Therefore, to have positive self-esteem, nurses must develop their self-care ability by recognising their unique self-care patterns and choices of health-promoting strategies (Öhlén & Segesten, 1998).

In addition, a positive nurse's professional identity is exceptionally critical for nurses' performance, which results in better patient care outcomes (Lotan, 2019; Johnson *et al.*, 2012). Nurses are an important, and highly valuable medical resource; hence, this has resulted in the importance in understanding their professional identity being understood (Samaniego & Cárcamo, 2013; Kunhunny & Slamon, 2017) and how it can influence the EHRs use in a developing country context (Kumar *et al.*, 2020).

### **2.4.3 Identity and EHR Literature**

Limited numbers of influential studies have examined different aspects of identity theory and related it to EHR resistance. For instance, Mishra *et al.* (2012) drew upon the notions of the role and social identity of healthcare professionals and conducted a survey that included physicians, administrators and staff. Their results indicated that physicians' decisions to use EHR depended on reinforcing their identity and/or examining any threat to their identity as a physician.

Further, a seminal study by Nach (2015) conducted a field study in a Canadian healthcare organisation, aiming to examine how physicians and nurses coped with the use of EHR and how it shaped their identities. Their results showed that when the EHR is challenging identity, physicians and nurses will either redefine or reinforce identity, depending on the availability of personal and organisational resources they have. Another study by Ulucanlar *et al.* (2013) aimed to explore the sociotechnical influences shaping the spontaneously occurring adoption of HIS in the UK's NHS. The study result showed that the users' behaviour towards the HIS is strongly influenced by their identity.

In addition, a study by Bernardi and Sarker (2013) utilised identity work to better understand how HIS could constrain the action of healthcare professionals in Kenya. Their result showed that actors do not always engage in resistance behaviour towards the implemented system; instead, they would engage with it when it is beneficial to them. Hence, according to Bernardi and Sarker (2013), users will modify or reinforce their identities.

Another study by Draus *et al.* (2019) aimed to understand healthcare professionals' experience while using EHR and what factors influence their perception of the EHR system. Their study concluded that issues such as policy compliance, system design and work environment are key factors that influence healthcare professionals' perceptions of the EHR. A further investigation by Baudendistel *et al.* (2017) explored the perceived benefits and concerns of the personal electronic health record (PEHR) among healthcare professionals. Their study showed that healthcare professionals expressed quality care improvement while they were concerned about patients' data protection and security.

Other researchers focused on physicians' professional autonomy and found that it can contribute to HIS resistance. For example, Walter and Lopez (2008) proposed that a perceived threat to professional autonomy would negatively affect the perceived usefulness of IS and the intention to use HIS. Their findings also claimed that perceived professional autonomy threats had a more significant impact on CDSS than on EHRs. Esmaelizadeh *et al.* (2015) further reported that a perceived threat to professional autonomy in knowledge sharing could negatively influence CDSS adoption in developing countries.

An additional study by Heath and Porter (2019) claimed that a perceived lack of control threatened professional autonomy, negatively affecting health information exchange implementation. A more recent study by Bernardi and Exworthy (2020) investigated how healthcare professionals with multiple identities perceive HIS implementation while safeguarding the integrity of their medical practices (e.g., patient care) as a priority. Their study found that healthcare professionals' multiple identities can positively compromise their ability to perceive the HIS implementation.

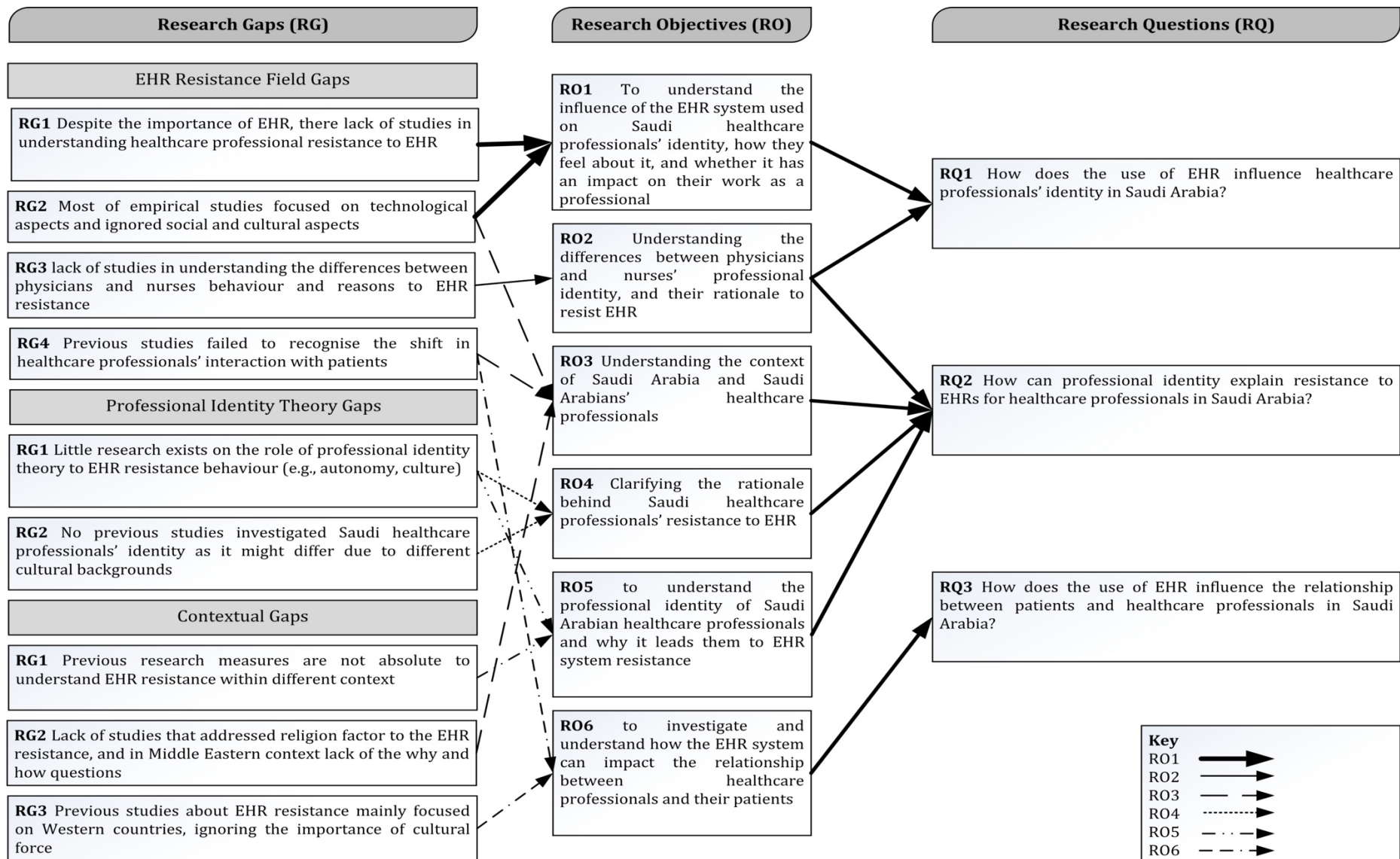
A further recent systematic literature review was done by Boonstra *et al.* (2022) and aimed to understand the influence of EHR usage on the physicians' medical professional identity and the effect of EHR on the interactions between physicians and their patients. Their findings showed changes in the interaction between physicians and patients as the communication became formal and bureaucratic. Furthermore, their results indicated a weakness in professional identity due to decreased autonomy, which could harm professionals' perception of being expert healthcare professionals.

#### **2.4.4 Literature Gaps and Research Questions**

As a group, the studies in section 2.4.3 provided a limited understanding of identity's influence on EHR resistance. Hence, we argue that healthcare professionals, which in our research represents physicians and nurses, resist using EHR due to changes in their professional identity, which is linked to an internal source of identities, as there is still a dearth of theory-based explanations of resistance (Kim, 2011; Kumar *et al.*, 2020). The next paragraphs will discuss the previous literature limitations (Figure 2.3).

The previous studies above examined different types of identities; yet, there is still a lack of understanding of identity theory and SIT and their impact on healthcare professionals' resistance to HIS, and specifically to the EHR system. For instance, Walter and Lopez (2008) expressed the need for other identity factors to be investigated in terms of professional identity and its effect on EHR resistance. Moreover, Esmaeilzadeh *et al.* (2015) reported that other professional identity factors might impact EHR resistance, such as EHR and perceived threats to professional autonomy, while Abdekhoda *et al.* (2015) included healthcare professionals' personality identity. Thus, further studies are essential regarding their professional values in terms of privacy and their reputation as professionals.

Mishra *et al.* (2012) and Ulucanlar *et al.* (2013) pointed out the need for exploring other identities, such as identity conflict, online identity and norms and values. Mishra *et al.*'s (2012) study has given limited understanding as their study was quantitative data-based, and one major drawback of this approach is that it cannot give us a deep and rich experience as a qualitative study can do (Creswell, 2014).



**Figure 2.3** A summary of research gaps, objectives and questions.



Additionally, Lapointe and Beaudry (2014) and Malillet *et al.* (2015) addressed the need for and importance of understanding emotional reactions and their motives, as Stets and Serpe (2013) confirmed that identity researchers focused on the “I am” and neglected the analysis of “I feel”. Further, it examined users, their negative responses and their ambiguousness towards EHR implementation as it may negatively affect them professionally (Lapointe & Beaudry, 2014). Hence, it would be a significant limitation when ignoring the role of identity in understanding the users’ response to an implemented EHR; this is because “identity matters”, and it has the potential to influence the end-user behaviour and, eventually, the success of the implemented EHR (Nach, 2015)

Furthermore, previous studies have not examined the differences between physicians’ and nurses’ professional identities and their reasons for resisting the EHR system: it is essential to differentiate between the two types of healthcare professionals’ points of view. It is vital to understand each of the two types of healthcare professionals’ motives behind EHR resistance (Alohali *et al.*, 2020) to get a deeper understanding of the EHR resistance to change. Hence, our first research question is:

***Research Q1: How does the use of EHR influence healthcare professionals’ identity in Saudi Arabia?***

Understanding how EHR use influences healthcare professionals’ identity in Saudi Arabia might not be enough to get a deeper understanding of the resistance problem. However, it helps us to have a vital piece of the EHR resistance puzzle in Saudi Arabian healthcare professionals, to better explain how professional identity can be a factor for EHR resistance. In other words, it needs to be understood how this influence can drive their behaviour and action as healthcare professionals when the EHR use is challenging their professional identity. This is due to a lack of studies that aim to try to understand professionals’ identity behaviour towards an implemented EHR (Nach, 2015).

Carter and Grover (2015) argued that identity is a primary motivator of behaviours. Hence, as a powerful occupational group, professionals usually tend to protect their high level of autonomy and values (Abbott, 2014). Thus, a person’s professional identity is central to how that person will interpret something and act in the context of a

professional situation (Chreim *et al.*, 2007). Consequently, in the case of healthcare professionals (physicians and nurses), a change or a threat to their role could affect their professional identity, leading to resistance with potentially dangerous implications, as their professional role identity is highly resistant to change (Chreim *et al.*, 2007). In addition, when professionals experience an identity threat, they are motivated by their professional identity to resolve the threat (Jussupow *et al.*, 2018).

Therefore, it is essential to understand the influence of technology on identities (Nach, 2015) and try to fill the notable gap in understanding healthcare professionals' views on the change process in the hospital (Esmailzadeh, 2021) and how those changes affect their professional autonomy (Heath & Porter, 2019; Esmailzadeh, 2021). However, previous research on the subject is limited, and a proportion of the studies have suggested getting a better understanding of the issue through expanding healthcare research, especially regarding EHRs, and examining how health IS applications influenced various stakeholders (Kholi & Tan, 2016), along with their context (Kumar *et al.*, 2020, Wyatt *et al.*, 2020).

Understanding the context of the professional identity is vital (Wyatt *et al.*, 2020), as most of the above studies were undertaken in a Western country's context, where healthcare professionals have different cultures and value backgrounds than in the Saudi Arabia (Al-Erakey *et al.*, 2014). Hence, several authors have called for empirical work to specify what component of identity can influence EHR adoption, as it is essential to understand this (Ulucanlar *et al.*, 2013; Piszczek *et al.*, 2016) because failure to consider the local context for IS use might eventually result in them not being used (Tarafdar *et al.*, 2012).

To illustrate, values could be considered a crucial factor in the individual's daily life, particularly for Saudis, as their behaviour is strongly influenced and guided by evaluating people's choices and actions (Moyo *et al.*, 2016). This is because healthcare professionals' professional values might influence their patient care decisions and how they carry out their work (Smith *et al.*, 1991). However, little IS research has focused on the nature and reasons for EHR resistance, and further studies are needed to address resistance and barriers to the EHR (Davidson *et al.*, 2018).

Additionally, Abdekhoda *et al.* (2015) have also called for further research to identify other aspects that could threaten EHR adoption, such as healthcare professionals' personalities and context. Nach (2015) addressed the need to identify the element of 'emergency' involved in the healthcare practices and how it can contribute to EHR resistance. Hence, Bardhan and Thouin (2013) and Morgan (2016) reported a lack of studies in understanding the impact on EHR end users. Many studies have reported the need to understand healthcare professionals' resistance to EHR (Mishra *et al.*, 2012; Kumar *et al.*, 2020; Alanazi *et al.*, 2019) as, for example, Heath and Porter's (2019) study did not explore how professional identity can be a factor with regards to EHR resistance. Henceforth, our second research question is:

***Research Q2: How can professional identity explain resistance to EHRs for healthcare professionals in Saudi Arabia?***

Additionally, it is essential to investigate the changes in their professional identity practices when implementing EHRs. For example, the identity theory-based EHR resistance literature has failed to recognise the shift in physicians' and patients' interactions when using EHR. Therefore, to the best of our knowledge, no study has highlighted the effect of EHR usage and its role on physician-patient relationships, as it is one of the fundamental aspects of medical professional identity in Saudi Arabia, for example, the changes in patient-doctor relationships in terms of contact culture discussed earlier.

Thus, understanding how technology might transform physicians could be essential (Nach, 2015). Bardhan and Thouin (2013) and Morgan (2016) reported a lack of studies aiming to understand the impact of EHR on users such as physicians and patients. Another study on the users' expectations (physicians and patients) called upon understanding the outcomes of the system and fears from the introduction of new EHR systems is essential to minimise user resistance, as they expect the systems to improve overall quality (Ali *et al.*, 2016). Hsieh (2015) also called for a cultural factor to be examined as it might be critical in a physician's decision to use or resist EHRs; therefore, using Saudi Arabia as the study context will be valuable in this regard. Hence, our third research question is:

***Research Q3: How does the use of EHR influence the relationship between patients and healthcare professionals in Saudi Arabia?***

Nach and Lejeune (2010) argued that research had understated the importance of emotions (such as pride, and self-esteem) in studying EHR resistance. Further, they argued that interactions with technology are more than just rational and “must consider the broad and numerous emotions that we are capable of feeling towards technology” (Nach & Lejeune, 2010, p. 627). The research on the impact of EHR on people's identities remains limited. Therefore, researchers need to pay greater attention to and contribute to emergent literature that places identity at the centre of organisation research (Nach & Lejeune, 2010), which resistance to digital transformational change is part of. Graf-Vlachy *et al.* (2018) were more specific and called for more studies to be conducted on this subject in developing ME countries.

## **2.5 Chapter Summary**

This chapter provided background literature and a definition of HIS applications, particularly EHR systems. It has reported and critically evaluated key related literature and theories regarding the resistance to change to IS and EHR use. The critical evaluation of previous literature and theories allowed us to locate the knowledge gap that this thesis filled. The chapter has also introduced, explained and justified our main theoretical lens through which to understand the resistance to change phenomenon. Finally, our research questions, which have been driven by the gap of knowledge in the field, have been presented.

## **Chapter 3**

# **Context of Study: The Culture of the Kingdom of Saudi Arabia**

This chapter provides the cultural background for the research study to set the context and facilitate understanding of the narrative the research seeks to tell, given that context greatly influences the EHR implementation. The chapter is structured as follows: First, it provides contextual information about Saudi Arabia; second, a background regarding our research context's healthcare system is presented, and the challenges facing EHR transformational change in Saudi Arabia; and finally, the importance of healthcare professional identity followed by the chapter summary.

### **3.1 The Context of Saudi Arabia**

Saudi Arabia, or the third Saudi state, was founded in 1932 by King Abdul-Aziz Al-Saud and is called the third Saudi state among Saudi Arabians. The first Saudi state was created in 1744. Its formation and political success resulted from a historic partnership between the head of the Al-Saud family Muhammed ibn Saud, and the conservative Islamic reformist and preacher Muhammed ibn Abd Al-Wahhab (Anishchenkova, 2020). This success was seen as a threat by the Ottoman Empire, which directed its army in Egypt, led by Muhammed Ali, to invade the country, destroying the first Saudi state in 1818 (Ismail, 2012).

The second Saudi state was established after Turki ibn Abdullah ibn Muhammed, the grandson of the first Saudi ruler, succeeded in regaining power after expelling the Ottoman forces in 1824 (Anishchenkova, 2020). However, internal conflict within the Al-Saudi family and external conflict with another royal family called Al-Rashid caused the second Saudi state to be defeated in 1891. In 1891 King Abdul-Aziz Al-Saud, the founder of the current third Saudi state started his struggle to reclaim his family's throne by pushing the Al-Rashid family's forces out of Riyadh, the capital of Saudi Arabia, and his struggle ended in 1932 by forming and announcing the Kingdom of Saudi Arabia (Ismail, 2012; Anishchenkova, 2020).

Saudi Arabia has been a country from its first state, was founded by the conservative Islamic religion and tradition, and is still considered a significant force to the Saudi people to date. This emphasises the significance of the Islamic faith and culture in the country, and its importance to be understood. Cultural issues can challenge the improvement of organisational performance, particularly, in a strong, conservative cultural background country such as Saudi Arabia (Alharbi *et al.*, 2017).

Saudi Arabian is the largest country in the Arabian Peninsula, economically with 298.6 billion US\$ (Argaam, 2023), geographically, with a net area of 2.14 million km<sup>2</sup> (Almatar, 2022), and a net population of more than 30 million people. Saudi Arabia is one of the G20<sup>13</sup> members (Cahyadi & Magda, 2021), and it is a country located in a historically unique place, where it has a long history of being a trade centre due to its exceptional positioning (The Economist, 2020), and it is one of the fastest growing economies in the world (Argaam, 2023). Its capital is the city of Riyadh, which is where the study took place, and it is the largest city in the country with a spatial area of almost 3000 km, covering 209 districts, and 13 municipalities (Almatar, 2022).

Hence, owing to the massive increase in their economic wealth, the Saudi Arabian government have taken steps to invest in implementing the EHR system to improve the quality of care and health for their people (Alanazi *et al.*, 2020). Saudi Arabia is now the fastest-growing digital health market in the region, due to the government planning to invest more than US\$66 billion by 2030 to improve its digital health infrastructure (Abuljadayel, 2022).

### **3.1.1 Definition of Culture**

Culture is often a cause of an organisation's experience of failure (Leidner & Kayworth, 2006), particularly when it comes to IS failure (Perchonok & Montague, 2012; Kwong & Levitt, 2009). Culture has been defined in many ways; to illustrate, Kroeber and

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<sup>13</sup> The "G20 is an international forum that brings together the world's major economies. Its members account for more than 80% of the world's GDP, 75% of the global trade, and 60% of the world's population" (Cahyadi & Magda, 2021, p. 2).

Kluckhohn (1952) identified more than 160 definitions for culture<sup>14</sup>. However, in our study, we define culture as a “collective programming of the mind which distinguishes one group from another” (Hofstede, 2001, p. 9).

Individuals within a particular society or an organisation usually behave according to the set of values and norms they have gained from their culture or their society, and those values and norms are the main characteristics of an individual or a group (Kidd, 2002). Cultural value can be described as "the implicit and explicit idea shared about what is good, right and desirable" (Zakaria *et al.*, 2003, p. 53), while norms are "the prescribed ways of patterns of behaviours that society expects of its normal members (Kidd, 2002, p. 17).

### **3.1.2 The Background of the Saudi Arabian Characteristics and Culture**

Saudi Arabia has a unique society in terms of its social structure, even among other Arab states, due to its Arabian tribal culture that has been determined, defined and mainly influenced by the Islamic religion (Table 3.1) (Zakaria *et al.*, 2003; Najm, 2015). Islamic religion plays a significant role in shaping people's cultural values, social life and norms and is the primary source of law (Aldraehim *et al.*, 2012). In Arab and ME countries, religious and cultural factors are said to be influential in shaping employee behaviour (Alharbi *et al.*, 2017).

In addition, cultural issues pose a particular challenge with regard to improving organisational performance (Alharbi *et al.*, 2017), particularly in Saudi Arabia (Alanazi *et al.*, 2020). There is no separation between the secular and religious life in the country. Thus, it is necessary to understand the religion to comprehend why people in a particular culture, such as the Saudis, behave in this way (Rice, 2003). We aim to understand why and how healthcare professionals' identities in the Saudi Arabian public hospitals are triggered to resist EHR use and how culture could be a factor in this EHR resistance. Thus, we selected Saudi Arabia as an example of a developing country within the ME region to

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<sup>14</sup> For instance, culture can be defined as a way of living for a group of people (Kidd, 2002) also, Holborn *et al.* (2004) referred to culture as how people in a particular group express their way of life, and it was suggested that culture is learned and shared by that group.

answer our question, as the generated knowledge could be helpful to give a general understanding of resistance in the region.

Element	Description
<b>Tribalism</b>	People share a common ancestry and kinship and use their tribal affiliation as their last name
<b>Religion</b>	Islam
<b>Language</b>	Arabic
<b>Dress Code</b>	Saudi citizens wear traditional Thobe <sup>15</sup>
<b>Political System</b>	Monarchy
<b>Economy</b>	Oil-based economy

**Table 3. 1** *The Saudi Arabian Cultural Characteristics (Al-Khoury, 2010).*

### 3.1.3 Hofstede’s Theory of Cultural Dimensions of the Saudi Arabian Culture

Based on data collected from 50 countries and three regions, Hofstede (1980, 1983) was able to classify four cultural dimensions which explain human behaviour<sup>16</sup> (i.e., Power Distance, Individualism vs Collectivism, Uncertainty Avoidance and Masculinity vs Femininity), and Saudi Arabia was part of Hofstede's study (Al-Twajiri *et al.*, 1996). Hofstede, (2001) stated that these dimensions are distinctive and stable and argued further that each person has their own "mental programme" that has been shaped during their childhood and further developed later in academic institutions (Eringa *et al.*, 2015). Next, we discuss the four dimensions that explain human behaviour to understand how the Saudi Arabia’s culture could impact EHR resistance from healthcare professionals.

<sup>15</sup> This is the traditional formal dress for the Saudi Arabian citizens.

<sup>16</sup> His original research was conducted in the late 1960s with a huge sample of 116,000, and based on his analysis, four cultural dimensions were generated, and later five dimensions of cultural orientation based on various nations (Hofstede, 2001; Hofstede et al., 2010).



### Power Distance Index

Power distance (PD) is the extent to which a society accepts the unequal distribution of power in institutions and organisations (Hofstede *et al.*, 2010). The Power Distance Index (PDI) ranges from zero to 100, with 50 as the mid-point. A PDI of more than 50 represents a large PD (Table 3.2). Institutions are the essential elements of society, such as the family and the community, which are very important in Saudi Arabia. The country is being ruled by a royal family, as a consequence, Saudi Arabia is politically centralised, which encourages the presence of PD conditions (Al-Twaijri *et al.*, 1996).

<b>Cultural Dimension Indices</b>	<b>Saudi Arabia</b>
Power Distance (PDI)	73
Uncertainty Avoidance (UAI)	74
Individualism vs Collectivism (IDV)	41
Masculinity vs Femininity (MAS)	43

**Table 3. 2** A Summary of the Saudi Arabia Cultural Dimensions

Countries with a high PD, such as Saudi Arabia which scored 73 in the PDI, have a more dependent relationship between the leader and the followers. This can be seen in Saudi Arabia, as families (parents or tribes) tend to have more firmly guiding relationships with their children, as they are respected, and their decisions are followed by their sons. This respect came not only from Arabic culture but also from the Islamic religion, which encourages respect for the parents and considers the opposite a sin. Also, even among the children themselves, older children should be followed by younger children.

### Uncertainty Avoidance Index

Uncertainty avoidance (UA) is the extent to which an individual from a specific culture feels threatened by unclear or unknown situations (Hofstede *et al.*, 2010). Thus, countries

with a high UA number try to avoid these situations by establishing more rules and internal regulations to control the work process and by rejecting different ideas and behaviour (Al-Twajiri *et al.*, 1996; Hofstede *et al.*, 2010). The Uncertainty Avoidance Index (UAI) values range from zero, which is the weakest uncertainty avoidance, to 100 for the strongest, and we can see from (Table 3.2) that Saudi Arabia has a high score for UA with 74, which indicates the society's low level of tolerance for uncertainty (Cassell & Blake, 2012).

In countries with a high UA, people know who reports to whom, and a formal line of communication runs vertically, which means that management reduces uncertainty by stressing who has authority over whom (Al-Twajiri *et al.*, 1996). This is true in the case of Saudi Arabia, as we will see from the hospital policies about, for example, healthcare professionals. Hence, due to these higher UA characteristics, Saudi society does not prefer change, and they are considered to be very risk-averse (Cassell & Blake, 2012). Therefore, this could explain and help us understand why the EHR adoption is low and why the people, particularly in Saudi Arabia, are resisting EHR.

#### Individualism vs Collectivism Index

Individualism is where the ties between individuals are loose, and the tendency is for people to take care of themselves and their families only. Collectivism, on the other hand, is the opposite, as people tend to belong to a group and look after each other in exchange for a strong loyalty in a tightly integrated society, in which people distinguish between in-groups (i.e., relatives, clans, organisations) and out-groups (Al-Twajiri *et al.*, 1996). The Individualism versus Collectivism Index (IDV) ranges from zero to 100, with 50 as the mid-point. Saudi Arabia scored 41 (Table 3.2), which means that it is a collectivist country.

Islam prefers a collective society based on a strong sense of solidarity and a common sense of social well-being (Rashid *et al.*, 2020). Hence, healthcare professionals in Muslim countries such as Saudi Arabia tend to look after their patients and care about what worries them, such as information leaks. As in Islam, people are urged, encouraged and rewarded to care for and help each other, and it is a significant reason behind the IDV result (Al-Twajiri *et al.*, 1996). Also, another factor is the fact that Arabs, as discussed

earlier, are organised into tribes, families or areas, and they strongly associate themselves with these symbols of unity (Al-Twajiri *et al.*, 1996).

The person's loyalty to his family or tribe is strong in collectivist societies such as that in Saudi Arabia due to social forces that strengthen such associations (Al-Twajiri *et al.*, 1996). According to Adler (2001), internal-guilt pressure is one way that collectivist societies control their members i.e., through shame. Shame in Saudi Arabia is associated with an individual who does not behave as expected. For example, drinking alcohol is a behaviour that is not acceptable; hence, as we will see later in our data, healthcare professionals understand that and do not record this information.

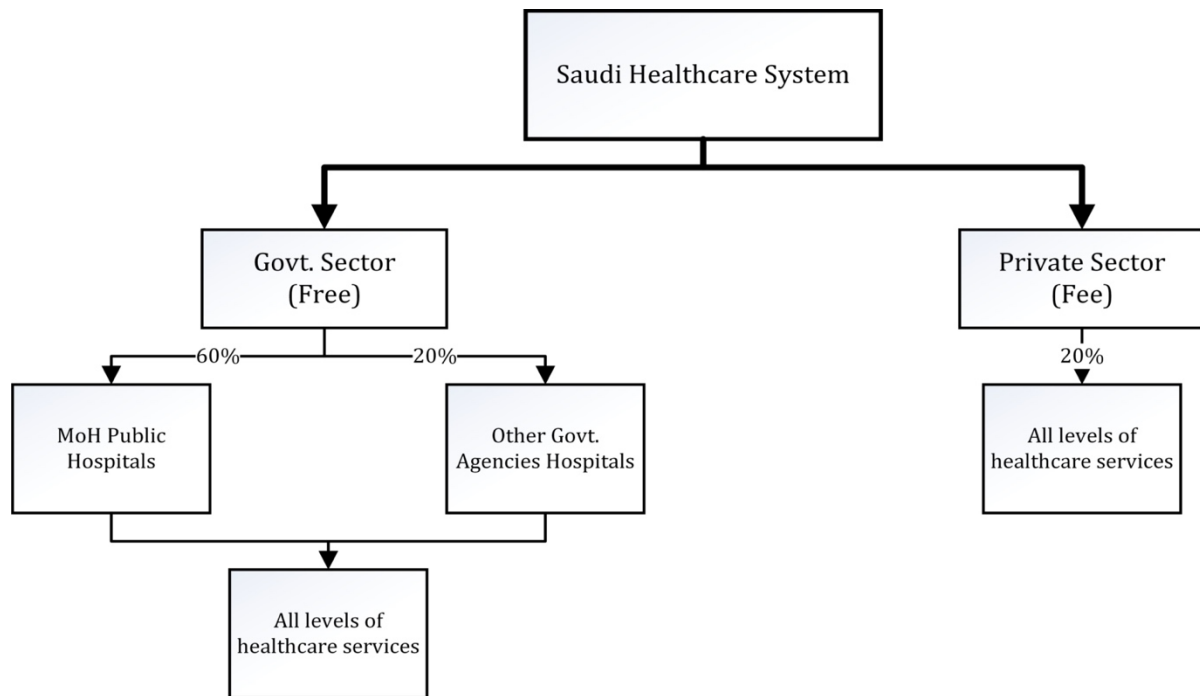
### Masculinity vs Femininity

This cultural dimension is based on "social-ego" factor scores, called Masculinity vs Femininity, which refers to the "dominant sex role pattern in the majority of both traditional and modern societies; that of male assertiveness and female nurturing" (Hofstede 1983, p. 19). For example, Saudi Arabia scored less than 50 on the Masculinity versus Femininity Index (MAS), indicating that they are feminine (Table 3.2) (Al-Twajiri *et al.*, 1996). As previously mentioned, the Islamic religion and tribal systems express the notion of caring and collaboration among the group. Hence, Saudi Arabia is a country with an emphasis on concern for others and friendly relationships among people (Bjerke & Al-Meer, 1993).

## **3.2 The Background of the Saudi Arabian Healthcare Service**

Saudi Arabia stands out as a critical player in the Arab World, as it has one of one of the biggest land masses and populations in the ME (Alshahrani *et al.*, 2019), with an estimated net population of 32 million people. In Saudi Arabia, there are three providers delivering healthcare services: first, the MoH; second, government-run healthcare authority facilities (the military, and the Ministry of Education's facilities which are known as teaching hospitals); and finally, the private sector (Almalki *et al.*, 2011; Aldosari, 2017). The MoH supervises private-sector hospitals to ensure service quality (Alshahrani *et al.*, 2019).

However, the private healthcare sector mainly operates in the major cities in Saudi Arabia, and the governmental hospitals provide services to a defined population, usually their employees and their families (Aldosari, 2017). Hence, the MoH in Saudi Arabia is the leading governmental agency with overall responsibility for health policies and planning (Aziz, 2017) and is the leading provider of healthcare in the country, which provides free of charge healthcare services for all citizens in Saudi Arabia (Rahman & Alsharqi *et al.*, 2019; Alatawi *et al.*, 2020). To illustrate, the MoH provides 60% of the healthcare services to the citizens (Figure 3.1), while private sector hospitals deliver 20%, and the other 20% is being provided by other sectors such as the university hospitals, the military and national guard hospitals (Alsadrah, 2020).



**Figure 3. 1** Structure of the healthcare system service in Saudi Arabia.

### 3.2.1 The Challenges and the Need for Change in the Saudi Healthcare Service

However, the Saudi healthcare sector is facing multiple challenges. For example, the country has witnessed a rising life expectancy rate of 3.2% (Alanezi *et al.*, 2020), which is seeing a high number of the population ageing. Consequently, the increasing population will lead to growth in healthcare demand (Nilsen *et al.*, 2016). In addition, having a big

land mass comes with its challenges: the Saudi healthcare system is facing difficulties in delivering healthcare because of the geographical terrain (Alshahrani *et al.*, 2019).

Moreover, The Saudi government's spending on healthcare has risen from 8% of the country's total GDP in 2018 to more than 14% in 2022. Furthermore, Saudi Arabia hosts the annual Hajj, which includes hosting many pilgrims and is considered the biggest recurring religious gathering in the world (Al-Tawfiq & Memish, 2014). This places an enormous demand on public healthcare services during this period. Therefore, with these challenges, there is a constant need for change to more efficient healthcare facilities. As such, it has been suggested that EHR system implementation would be of benefit. For example, EHR implementation is vital to providing adequate healthcare services during the Hajj season (Al-Tawfiq & Memish, 2014) and lowering healthcare services costs (Alanezi *et al.*, 2020).

Saudi Arabia was among the first countries in the ME region to adopt and use the EHR system back in 1993 when King Faisal Specialist and Research Centre (KFSH & RC) hospital started its operations (Altuwaijri, 2008; Alanezi, 2021). This has been done by introducing the internet technology to connect other branches of KFSH & RC in 1993 (Weber *et al.*, 2017), and since then other healthcare organisations in Saudi Arabia such as the National Guard Health Affairs, Medical Services of the Armed Forces, Universities hospitals followed their steps (Altuwaijri, 2008).

In addition, to boost the country's utilisation of the EHR system, the MoH in Saudi Arabia has launched the National Transformational Plan (NTP) for a five-year national e-health programme. The programme aims to build a quality health system based on patient-centric care, guided by standards and enabled by e-health (Altuwaijri, 2010). The NTP's goals are to achieve the following: first, ease of access to healthcare services; second, to improve the quality and efficiency of healthcare services through enhancing medical safety, reducing medical costs and errors, and increasing focus on digital healthcare transformation; and finally, to promote prevention of health risks.

In 2008, the MoH allocated US\$1.1 billion to develop the National EHR project, which aimed to build a central national database for EHRs and provide a secure communications link with all MoH hospitals (Alqahtani *et al.*, 2017). However, despite the huge

investments, EHR adoption by healthcare professionals is slow, and resistance to change is high (Alkrajji *et al.*, 2014; Alsadrah, 2020; Alanezi, 2021), which could be related to cultural factors within Saudi Arabia, resulting in healthcare professionals' resistance to EHR (Alkrajji *et al.*, 2014; Aziz, 2017; Alkhaledi *et al.*, 2020).

Therefore, this research project will investigate the problem of EHR resistance among healthcare professionals in the Saudi public healthcare sector, which is managed by the MoH. This research aims to study within public hospitals due to the following reasons:

- The MoH national strategy aims to transfer all public hospitals into an electronic-based record (Almutairi & Moussa, 2014).
- Most Saudi citizens use public hospitals instead of private ones due to many reasons, including that the care is free (Alatawi *et al.*, 2020).
- The government invested heavily in public hospitals, as the Saudi government prioritises healthcare services for Saudis and expatriates (Almutairi & Moussa, 2014). For example, Saudi hospitals increased from only 74 in 1970 (Almutairi & Moussa, 2014) to 497 in 2021, and more than half of this number, 287, is managed under the MoH, while the number of beds increased from 9,039 to 77,224, with 45,330 of these being within the MoH hospitals (Statistical Yearbook, 2022).
- The researcher's ability to gain access to physicians and nurses to conduct his interviews.

### **3.2.2 EHR Resistance to Change Literature in Saudi Arabia**

Many researchers have attempted to understand why healthcare professionals in Saudi Arabia resist using the EHR system. For instance, Khalifa (2013) conducted a questionnaire study with a random sample of healthcare professionals in two major hospitals in Saudi Arabia, the first private and the other a public hospital, in order to try to understand EHR resistance. Khalifa's (2013) analysis resulted in identifying barriers such as human, financial, legal and professional barriers. Likewise, a study conducted by Hasanaina *et al.* (2015) concluded that a lack of technical expertise among healthcare professionals is an issue that may obstruct a successful implementation.

Furthermore, Mahalli (2015) conducted a study to assess the barriers to EHR use among nurses in a public hospital. The study reported barriers such as loss of access to EHR due to power or computer failure, the extra time taken to record patients' information, a lack of system customisability and a lack of training (Mahalli, 2015). Another study by Zaman *et al.* (2018) aimed to discover the challenges and barriers to EHR implementation in Saudi Arabia. Their study concluded that hospital staff found it challenging to access the EHR system, and only 7.8% reported that the system was easy to use. Zaman *et al.* (2018) attributed this to the hospital's lack of training and supervision.

An additional study by Alsulame *et al.* (2016), based on a systematic literature review, revealed that a lack of IS technical knowledge, coordination between professionals, confidentiality concerns and a lack of policies and regulations were the leading causes of EHR resistance. Alqahtani *et al.* (2017) conducted a further systematic review to understand EHR barriers by healthcare professionals in Saudi Arabia. Their main findings were a lack of computer experience among healthcare professionals, a lack of perceived usefulness, a lack of perceived ease of use by healthcare professionals, technical limitations, the quality of patient information and confidentiality concerns.

A systematic literature review study conducted by Alshahrani *et al.* (2019) aimed to critically appraise and present evidence of the status of EHR adoption and acceptance in Saudi Arabia from multiple stakeholders' perspectives. Their study concluded that there are 39 factors and grouped these factors into six clusters which came to influence the adoption of EHR in the country. A further study by Alsohime *et al.* (2019) aimed to explore factors influencing paediatricians' satisfaction with an implemented EHR in the country's teaching hospitals. They reported challenges that impact the proper utilisation of EHR among paediatricians such as a lack of information system support, hardware and time-consuming data entry processes (Alsohime *et al.*, 2019).

A more recent study was conducted by Albarrak *et al.* (2021) that evaluated the readiness among physicians in Saudi Arabia to use EHR applications in their clinical practises. The study used a cross-sectional questionnaire and reported that the main issues concerning physicians using the system are patients' privacy, the high cost of equipment, a lack of suitable training and a lack of consultation between information system experts and clinicians. Another study by Alanezi (2021) investigated the factors that influence the

adoption of EHR in Saudi Arabia. The study used a questionnaire design approach and indicated factors such as a lack of a relationship between physicians and patients, fear of violating data privacy, and a lack of government regulation.

However, taken as a group, the above previous studies have focused mainly on what are the factors that influence EHR resistance and hence concentrate primarily on the 'what', and they adopt quantitative approaches. They do not achieve an understanding of 'why' healthcare professionals are resisting using the EHR and how this behaviour manifests itself. Qualitative research is built upon human experience (Anderson, 2010), which is what is needed when addressing EHR resistance problems among healthcare professionals, because understanding the human factor is crucial for EHR implementation to succeed (Aljarullah *et al.*, 2017).

Hence, more in-depth studies are necessary (Alshahrani *et al.*, 2019) as healthcare professionals' perceptions are reported to have a vital role in EHR use (Alanazi *et al.*, 2020). Therefore, Alqahtani *et al.* (2017) called for a qualitative research approach to reveal other factors not considered in the previous studies, and Aldosari *et al.* (2018) specifically suggested interviews with open-ended questions to uncover these factors. Factors such as religion and culture need to be included and have been recommended by several researchers in Saudi Arabia (Albarrak *et al.*, 2021; Alanezi, 2021; Alanazi *et al.*, 2020; Weber *et al.*, 2017) as scholars have not examined cultural and religious factors in detail.

Mahalli's (2015) study focused only on nurses while ignoring physicians as one of the primary users of the EHR system, and there is a need to understand the view of different professionals, as there is a lack of literature about various stakeholders' perspectives in Saudi Arabia (Alshahrani *et al.*, 2019). While Zaman *et al.*'s (2018) study did not specify which type of healthcare professionals were included in the study, Alsohime *et al.*'s (2019) study focused on only one group of physicians and suggested the need to understand other physicians' perspectives, as his study lacks assessing and understanding of the physicians' attitude during the change process towards the EHR.

Although extensive research has been carried out in order to understand healthcare professionals' factors that lead them to resist the EHR, many of them highlighted patients'



privacy as a factor, including in Western countries (Anderson & Agarwal, 2011; Angst & Agarwal, 2009). Yet, they have not, and are still failing to address the 'why' question of why the privacy of patient information is a significant concern to healthcare professionals. Hence, this research will address this question and assume the cultural aspects may be able to give us answers because understanding what healthcare professionals feel or do in their natural context is vital to understand the motives behind their actions (Korstjens & Moser, 2017).

In addition, Mahalli's (2015) paper only covers the Eastern part of Saudi Arabia, and a recommendation has been suggested to extend the research into different geographical settings across the country to get a better picture and due to the variation level of EHR adoption between hospitals and regions (Alshahrani *et al.*, 2019). Finally, Shaikh and Karjaluo (2015) and Alsohime *et al.* (2019) called for more studies in the ME region due to the lack of research in this area.

### **3.2.3 Saudi Arabian National Culture**

It is argued that organisations are necessarily embedded in and influenced by a national culture (Alharbi *et al.*, 2017), and this research, as suggested above, proposes that EHR resistance among healthcare professionals in Saudi Arabia is a result of cultural factors. National culture has its role in influencing individual behaviour within society and in the success of IS deployment (Lee *et al.*, 2013). In Arab and ME countries, religious and cultural factors are said to be influential in shaping employee behaviour (Alharbi *et al.*, 2017). Cultural issues can challenge the improvement of organisational performance, particularly in Saudi Arabia (Alharbi *et al.*, 2017).

While not all Arabs are Muslim, the Arab culture is influenced heavily by Islamic tradition and tribal values (Rice, 2003). Arab culture can be defined as the set of behaviours and attitudes that are shared among all Arabs (Obeidat *et al.*, 2012), and it has been associated with IS resistance (Zakaria *et al.*, 2003). There is no separation between secular life and religious life in Saudi Arabia; thus, it is necessary to understand religion to understand why people in a specific culture behave in a particular way (Rice, 2003).

Saudi Arabia is an Islamic Monarchy, the birthplace of Islam and its King; King Salman is the Custodian of the two holy mosques of Mecca and Al-Madinah (Brdesee *et al.*, 2012). Hence, Islam is not only represented as the country's religion but also as a political system. Furthermore, Saudi Arabia is a conservative society, and people's culture and social lives focus on the Islamic religion as their religious identity. This means that religious values come first in the social life of Saudis and extend into their personal relations to tribal or family values, which is part of the teaching they have been given by the Holy Quran (Alosaimi, 2013). Also, Saudi Arabia occupies a unique position in the Islamic world since it is home to the Two Holy Mosques for Muslims, which help make the Islamic religion the primary influence in the country (Aldraehim *et al.*, 2013).

The legal system in Saudi Arabia is based on the Shari'ah Law (Islamic teachings) (Elamin & Tlaiss, 2015); therefore, the values of Islam are the main element of the Saudi culture (Najm, 2015; Kwong & Levitt, 2009). Along with it playing a significant role in Saudi's culture, it also defines the social manners, traditions, obligations and social practices as Islam is not just a belief but also a comprehensive way of life (Elamin & Tlaiss, 2015). For example, according to Islam, consuming pork is prohibited in Saudi Arabia, as the religion discourages the consumption of any food or drink that may harm or change the body and mind, and is punishable by Shari'ah law if one consumes them.

The Saudi character is mainly shaped by the Islamic religion through two primary sources, the Quran and the Sunnah, which serve as guidelines for their behaviour as Muslims in their private and professional lives (Elamin & Tlaiss, 2015). Also, within the Arabic culture *Urf* (العرف) is included as well as the tribal system. Islam is the first and the most critical element of the Saudi culture, and it guides people's behaviour in their lives and works through the Quran (the Holy Book) and the Sunnah (the saying and practices of the Prophet Mohammed, peace be upon him) (Kwong & Levitt, 2009). These ethical values are outlined as "to be valid at all times and places" and "are not subject to change", and they are often referred to as the principles of work and management (Elamin & Tlaiss, 2015, p. 5).

Furthermore, the emergence of Islam during the 7th century provided local communities with a set of laws based on Islamic teachings and approved customary laws (*Urf*) practised by Arabs before Islam (Saleh, 1989). *Urf* originated from the Prophet's sayings,

and can also relate to what people were practising before Islam if it did not contradict what Islam says (Saleh, 1989). For example, even before Islam, Arabs were generous people, and anyone visiting an Arab could stay at their home for at least three days. Islam came and encouraged such behaviour or this *Urf*; hence, this Arabic *Urf* became acceptable in Islam.

In addition, the tribe system means kinship or family comes first and significantly impacts individual and workplace behaviour (Aldraehim *et al.*, 2012). Family in Muslim societies, particularly in Saudi Arabia, is treasured, as most Saudis define their identity first by bloodlines (family), then geographically (Maisel, 2014). Moreover, the Quran and Sunnah emphasise the importance of family, and individuals are expected to sustain good relations with their relatives, help them when needed, and be generous and kind to others (Aldraehim *et al.*, 2013). Therefore, its tribal conservative adherence to Islam makes it a collectivist culture that reflects placing family needs over an individual's (Aldraehim *et al.*, 2012; Zakaria *et al.*, 2003). Hence, as part of this value, people, especially those with power, are expected to provide privileges or help their relatives.

### **3.2.4 Influence of the Saudi Context on the Work of Healthcare Professionals**

Arabic culture is the other form of Saudi culture and is a strong predictor of IS resistance (Zakaria *et al.*, 2003; Aldraehim *et al.*, 2012). The Arabic culture stresses the importance of home and the traditional nature of its influence on adopting new technologies (Aldraehim *et al.*, 2013). Therefore, the culture in Saudi Arabia sets the agenda for people's social life (Aldraehim *et al.*, 2012). Hence, what we have discussed earlier about the elements of the Saudi culture represent how strongly these elements influence people's behaviour and make them different from other societies, resulting in the importance of the need to be studied and understood.

For example, Arabic culture is a personal interaction-driven culture (Zakaria *et al.*, 2003), meaning that patients prefer healthcare professionals to spend the consulting time personally interacting with them rather than looking at the computer screen. Hepniemi *et al.* (2017) suggested that using the EHR consumes 55% of the consultation time, which could affect patient satisfaction, and as a result, physicians might avoid using the system.

Additionally, while privacy is a universal issue, it holds greater importance in Saudi Arabia because the Islamic religion grants a person the right to personal privacy. Hence, any threat to patient privacy due to EHR could be met with resistance by healthcare professionals. Thus, such distinct social and cultural conditions are important factors in understanding how healthcare professionals perceive technology in Saudi Arabia (Alkariji *et al.*, 2014).

### **3.3 The Importance of the Professional Identity of Healthcare Professionals**

Healthcare professionals work hard to establish and maintain a unique and essential professional identity through extended education (Goltz & Smith, 2014). Therefore, professional identity is critical to the individual's sense of self: "It is about connecting with roles, responsibilities, values, and ethical standards unique to the specific profession" (Goltz & Smith, 2014, p. 1). Thus, professional identity influences how individuals claim purpose, self-worth and meaning for themselves (Chin *et al.*, 2020), especially the physicians' and nurses' professional identity, because it is more robust than their organisational, team or departmental identity (Van Os *et al.*, 2013).

Motivated thus, and due to their specific characteristics as healthcare professionals, which are different from other categories of IS users (Chau & Hu, 2002), this resulted in a need for their importance to be understood. In addition, by understanding how healthcare professionals see and feel about EHR, we can help managers design or re-design the technology accordingly (Lomotan *et al.*, 2012; Jussupow *et al.*, 2018). Hence, Graf-Vlachy *et al.* (2018) suggested that utilising psychological theories to understand human behaviour is vital.

Healthcare professionals' sense of professionalism involves their autonomy and focus on patients' best interests (Abouzahra, 2014; Walter & Lopez, 2008). Professionals have significant roles in organisations and society, so it is vital for researchers to understand the dynamics underlying the influence of a professional role on a person's identity (Chreim *et al.*, 2007). Identity could help us make sense of and understand actions or behaviours (Gioia *et al.*, 2013) such as IS resistance (Gal & Kjargaard, 2009).

Focusing on identity issues in organisations could help EHR researchers “produce thoughtful and meaningful insights into individual and collective self-constructions in organisations and into the interactions between the implementation and the use of IS” (Gal & Kjargaard, 2009, p. 2). In addition, another dimension of identity that should be studied is the role of identity in the context of illness (Morgan, 2016) as it may influence the decision to use the EHR system (e.g., as we will see later in our data that healthcare professional itself will not use their hospital EHR system to protect their information).

Hsieh *et al.* (2015, p. 169) stated that identities are “social categories or positions with which people identify and that they may appropriate as self-conceptions”. Therefore, each identity has its own role to play. For instance, physicians’ identities involve healing and medicating, while the identities of academics concern teaching and researching. Thus, we argue that identity theory provides a valuable lens through which to look to account for understanding resistance within a healthcare setting (Stryker, 2007; Stryker & Burke, 2000). Further, it has been argued that identity is a primary motivator of behaviours (Carter & Grover, 2015), and especially as health professionals are a powerful occupational group that works to protect their high level of autonomy and values (Abbott, 2014).

A person’s professional identity is central to how that person will interpret and act in the context of a professional situation (Chreim *et al.*, 2007). For instance, in the case of physicians, a change in their role could affect their professional identity, leading to resistance with potentially dangerous implications, or they could change their professional values. Consequently, resistance to change in the traditional role identity will continue to be faced, and need to be reflected in the literature (Chreim *et al.*, 2007).

In addition, identities help “organise an individual’s place in an interaction” and, more importantly, guide behaviour within the context of social structure (Stets & Serpe, 2013, p. 35). Hence, identities and culture or the individual’s environment are two sides of the same coin, and for us to understand peoples’ behaviour, we must understand both (Stets & Serpe, 2016). Consequently, to better understand EHR resistance, we must first understand the social context in which resistance occurs.

Despite the growing interest in identity theory (Touati *et al.*, 2019; Carter *et al.*, 2020) identity theory is still under-explored (Brown, 2017). In particular, there is still a lack of understanding of how identities are framed among those who carry out highly critical organisational functions, such as professionals (Pratt *et al.*, 2006; Wyatt *et al.*, 2020), especially in a developing country context (Kumar *et al.*, 2020; Stets & Serpe, 2013; Grossi *et al.*, 2021), such as Saudi Arabia (Alanazi *et al.*, 2020). The importance of professional identity is that it has a crucial role to play when it comes to EHRs implementation, whether to adopt or resist this technology (Nach & Lejeune, 2010; Lifshitz-Assaf, 2018), as professionals are known for protecting their knowledge of their work and their status from being threatened (Lifshitz-Assaf, 2018).

Therefore, this research suggests that Saudi Arabian healthcare professionals' position in society causes them to be uncomfortable with any attempt to change their current position in the community, which results in resisting an implemented EHR system. Moreover, while professional identity is continuously under study, the world is quickly changing due to the advancement of technology, and the subsequent changes in work practices cause identities to change (Pratt *et al.*, 2006). According to Kohli and Tan (2016) social and organisational challenges continue to disrupt EHR development.

It is crucial to understand the professional identity of Saudi healthcare professionals because professional identity theory has largely been ignored how users' context shapes their behaviour as a professional (Wyatt *et al.*, 2020). To illustrate, Abubakre *et al.* (2017b) stated that each individual is a unique product of several layers of identities that have been shaped and evolved during their life in a particular culture. Therefore, understanding their culture will result in understanding an individual's needs, and identity theory could provide a better understanding of individuals (Abubakre *et al.*, 2017b).

Additionally, to better understand and further develop identity theory, Stets and Serpe (2013) urged the need to examine other bases of identities, such as identities in different contexts in which an individual identifies themselves with a particular social category. People are born into social categories (Stets & Serpe, 2013) such as a specific race, culture and religion. For example, Saudi healthcare professionals categorise themselves in a

particular social category, that is, the conservative Saudi society, which is heavily influenced by Islamic religion and Arabic culture.

In addition, culture and practices are still considered a challenge to EHR implementation (Alnatheer & Nelson, 2009) due to how EHR is interpreted and given meaning (Bagchi *et al.*, 2004). Hence, contextual factors are essential to successfully implement healthcare innovations, as they are barely recorded, analysed or considered when implementing change (Grossi *et al.*, 2021). Contextual factors are "the set of characteristics and circumstances or unique factors that surround a particular implementation effort" (Grossi *et al.*, 2021, p. 2). For example, Hasan and Dista (1999, p. 5) stated that differences within technological level, culture, social priorities, and even the economic stability could influence the assimilation of technology.

The Saudi Arabian context and culture differ from Western countries' contexts and cultures (Al-Eraky *et al.*, 2014). For instance, professional autonomy for physicians in Arabic countries is a privilege not enjoyed by many other professions. This is reflected in physicians having a higher level of authority in decision-making regarding patients' health than their patients, unlike in Western cultures (Al-Eraky *et al.*, 2014). Hence, EHR introduction could alter the status quo, and this change could be unacceptable to physicians.

Therefore, the identity theory perspective is especially relevant to healthcare professionals in Saudi Arabia for three reasons:

- 1) They have a strong sense of professional identity, which is framed through their extended medical education, high autonomy and values (Pratt *et al.*, 2006; Wyatt *et al.*, 2020), along with a strong cultural background.

- 2) Studies have shown that healthcare professionals strongly resist implementing technologies (Kumar *et al.*, 2020) especially Saudi Arabian healthcare professionals, as it has been suggested that Arabic culture and values are a robust predictor of resistance to EHR change (Zakaria *et al.*, 2003; AlKraiji *et al.*, 2014).

- 3) Understanding individuals with multiple characteristics and identities, such as Saudi Arabian healthcare professionals, is more valuable than monolithic categorisation. It is

essential because of its significance in creating a helpful understanding of the EHR and user behaviour and in pushing towards a deeper understanding of how identity behaves in a different context (Morgan, 2016). Furthermore, Morgan (2016) argued that many identity elements can be drawn together to develop a comprehensive understanding of EHR use behaviour.

Thus, understanding the link between professional identity and EHR resistance is vital for a successful EHR implementation and understanding the source of resistance in order to be able to work towards reducing or eliminating it. Accordingly, this research presents a unique argument that depends on professional identity and how it affects physicians' and nurses' resistance to EHRs as professionals, noting that the professional culture of medicine in Western countries may differ from that of non-Western countries (Aleraky *et al.*, 2014).

In addition, the reason for choosing Saudi Arabia as the context of our study is that EHR implementation and success are critical and urgent for six reasons:

- The first is due to the rapid increase in the Saudi population across the country (Aldosari, 2017; Alatawi *et al.*, 2020).
- Secondly, the vast geographical area of the country, Alshahrani *et al.* (2019) is a challenge to deliver the best healthcare for the rural areas.
- Thirdly is the scatter system, which means that every public hospital in Saudi Arabia has its own type of EHR system and they are not connected (Almalki *et al.*, 2011; Aldosari, 2017), along with multiple systems inside the same hospital (Aldosari, 2017). For example, some hospitals have different X-rays systems, which are not connected to the main EHR; hence, healthcare professionals are forced to work on the two systems.
- Fourth is the Hajj and Umrah season, which places a significant demand on healthcare services during these times due to the healthcare services being needed by many pilgrims (Al-Tawfiq & Memish, 2014).



- Fifth, despite Saudi Arabia having remarkably high healthcare spending on healthcare services among many high-income countries (71.3% for Saudi Arabia vs 61.2% for high-income countries), the number of hospital beds is substantially lower (Alatawi *et al.*, 2020). Consequently, this indicates that each hospital bed in Saudi Arabia costs more than those in high-income countries (Alatawi *et al.*, 2020).
- Finally, the government needs to reduce healthcare costs in public hospitals, since it provides free healthcare services for its citizens (Alatawi *et al.*, 2020). This need has arisen due to diminishing oil prices between 2014-2017 and to ensure the success of the 2030 national vision (Rahman & Alsharqi, 2019) of which healthcare is one of the main aspects.

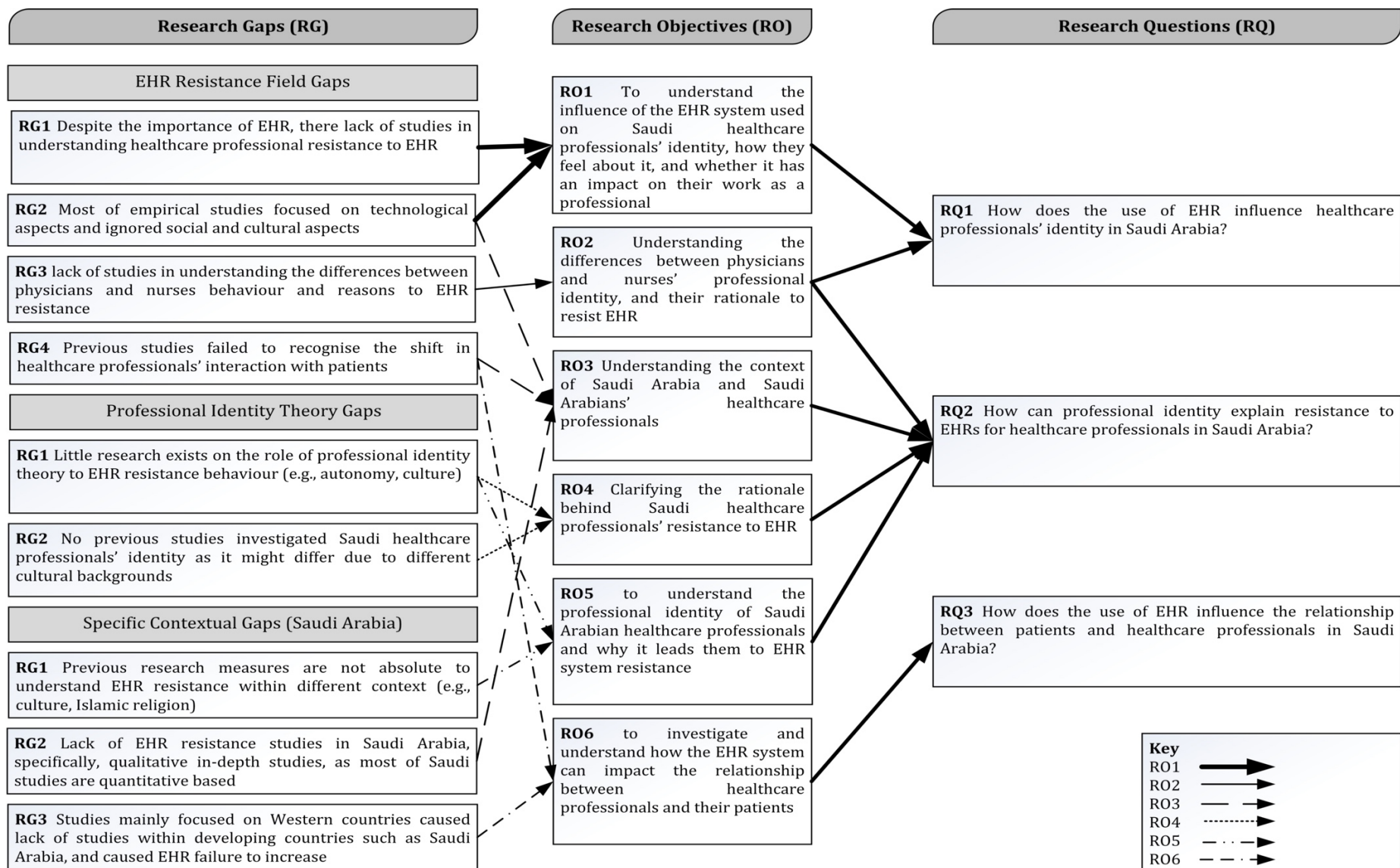
Therefore, along with the above challenges, the MoH is under tremendous pressure from the Saudi Arabian government to develop a high-quality healthcare system and improve its services for all citizens and residents (Alaboudi *et al.*, 2016; Alatawi *et al.*, 2020). However, despite the increase in the MoH hospitals' utilisation of EHR, the failure rate for the EHR projects in public hospitals are exceptionally high (Aldosari, 2017), resulting in the Saudi Arabian healthcare systems lagging behind (Alqahtani *et al.*, 2017; Aljarullah *et al.*, 2018). This failure could be related to healthcare professionals' resistance to EHR (Kumart *et al.*, 2020; Alanazi *et al.*, 2019).

### **3.4 Chapter Summary**

Chapter 3 provided us with the background needed to understand the study's cultural context. It is essential because it helps us understand the narrative the research seeks to tell. This has been done by explaining the context of Saudi Arabia and its culture. We also introduced Hofstede's theory of cultural dimensions, specifically his work on Saudi Arabia, to get a deep understanding of the resistance to change phenomenon. We then provided a detailed background of our study context (Saudi Arabia), the challenges facing the public healthcare sector and why change is needed.

A critical literature review about EHR resistance to change in Saudi Arabia was also provided with an explanation of the gaps that need to be filled (Figure 3.2). The chapter finally ends with the importance of the professional identity of the healthcare

professionals and how and why it could help us to explain the resistance to the EHR change phenomenon. In the next chapter, we will present, explain and justify the tools we used to answer our research questions.

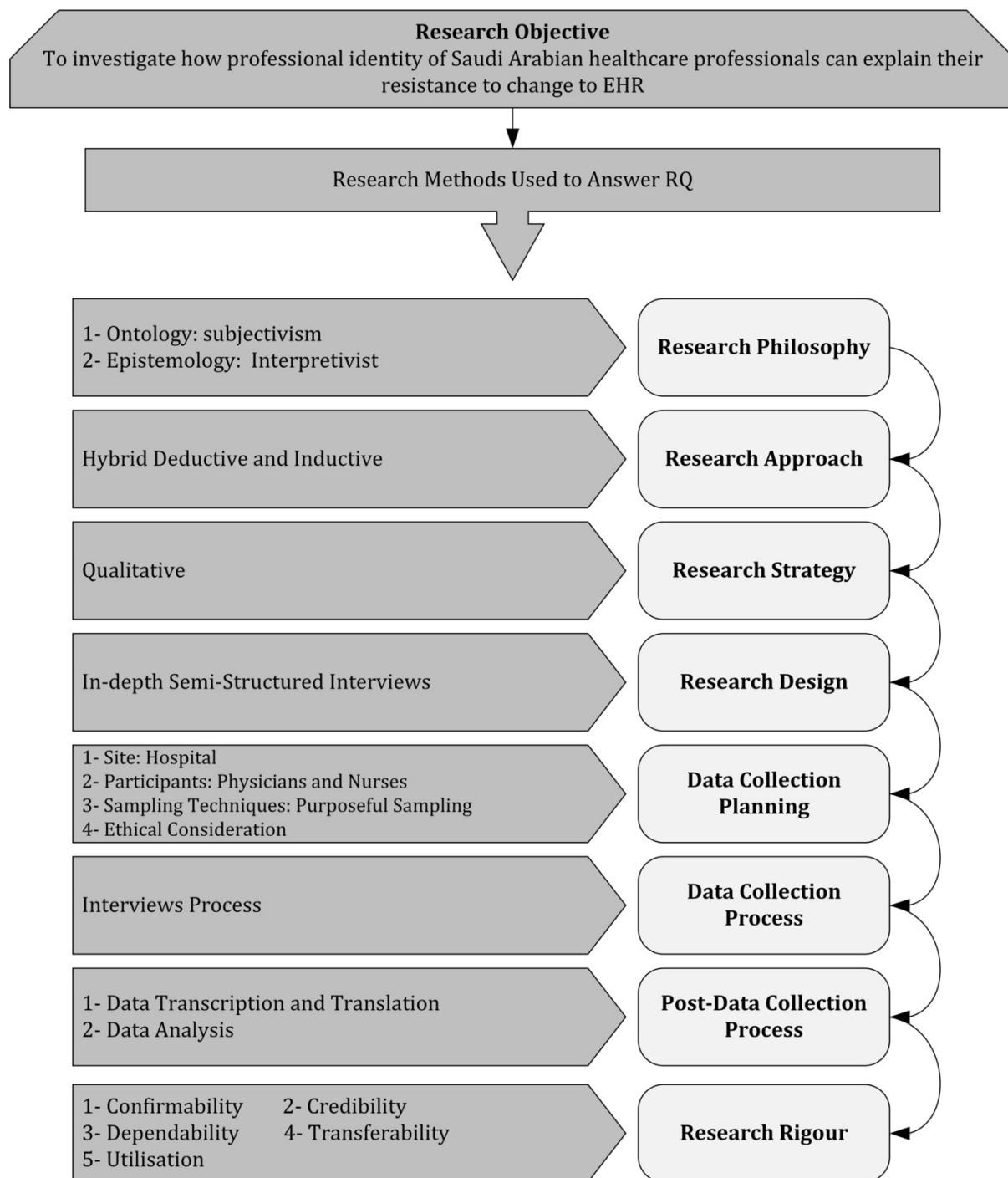


**Figure 3. 2** Summarising re-defined specific contextual gaps in the Saudi literature.

## **Chapter 4**

### **Research Methods**

This chapter will explain the rationale behind the methods chosen to help answer our research questions. Research methodology refers to “the study of the methods that are employed” (Bryman, 2008, p. 160), and methods mean the techniques that are used or employed by researchers for practising their craft (Bryman, 2008) (Figure 4.1). This thesis aims to investigate how and why Saudi Arabian healthcare professionals' professional and cultural identity could impact their resistance to EHR in Saudi Arabian public hospitals. This chapter will be structured as follows: first, it will outline the underpinning philosophical assumptions and approach, followed by the strategy and design, data collection planning and the process; finally, it will discuss in detail the steps taken to analyse the data and how they met the quality criteria.



**Figure 4. 1** Methodology and methods employed in this research.

## 4.1 Research Philosophy

**Research philosophy** refers to ways of developing knowledge (Saunders *et al.*, 2009). Research philosophy is essential because it shows how we view our research problem and what methods we will be applying to understand it. Hence, the scholar's failure to recognise their philosophical research issue can seriously affect the quality of the

research itself (Bahari, 2010). Therefore, understanding research philosophy is essential for three main reasons: 1) To help clarify the research design, 2) To identify which design may or may not work, and 3) to identify or create designs that may be outside their experience (Bahari, 2010).

There are at least two philosophical paradigms in research that should be considered: ontology and epistemology (Saunders *et al.*, 2009) (Figure 4.2). Both philosophical perspectives will guide and inform us regarding how we should proceed to answer our research questions. Therefore, in the following paragraphs, we will discuss these two philosophical paradigms and point out which one is suitable for our research, starting with ontology and then moving on to epistemology.

Assumption type	Questions	Continua with two sets of extremes		
		Objectivism	↔	Subjectivism
<b>Ontology</b>	<ul style="list-style-type: none"> <li>• What is the nature of reality?</li> <li>• What is the world like?</li> <li>• For example:               <ul style="list-style-type: none"> <li>– What are organisations like?</li> <li>– What is it like being in organisations?</li> <li>– What is it like being a manager or being managed?</li> </ul> </li> </ul>	Real	↔	Nominal/decided by convention
		External	↔	Socially constructed
		One true reality (universalism)	↔	Multiple realities (relativism)
		Granular (things)	↔	Flowing (processes)
		Order	↔	Chaos
<b>Epistemology</b>	<ul style="list-style-type: none"> <li>• How can we know what we know?</li> <li>• What is considered acceptable knowledge?</li> <li>• What constitutes good-quality data?</li> <li>• What kinds of contribution to knowledge can be made?</li> </ul>	Adopt assumptions of the natural scientist	↔	Adopt the assumptions of the arts and humanities
		Facts	↔	Opinions
		Numbers	↔	Narratives
		Observable phenomena	↔	Attributed meanings
		Law-like generalisations	↔	Individuals and contexts, specifics

**Figure 4. 2** Philosophical assumptions in research (Saunders *et al.*, 2014, p. 129).

Our **ontological** approach, which is “concerned with the nature of reality” (Saunders *et al.*, 2009, p. 110) will be based on subjectivism. It follows the interpretivist philosophy from the epistemological perspective, as it argues about the necessity of exploring the subjective meanings that motivate the actions of social actors to understand their behaviour (Saunders *et al.*, 2009).

Hence, our study tries to understand from a cultural point of view how and why the professional identity of healthcare professionals can lead to resistance behaviours towards the EHR. Choosing the proper ontology is essential, as it affects our choice of what to research for our PhD project (Saunders *et al.*, 2016). Therefore, this research thinks of cultural resistance as something that happens with every technology; we aim to address the problem to understand it better and reduce its negative effect.

Ontology has two aspects: **objectivism**, which can be defined as representing “the position that social entities exist in reality external to and independent of social actors” (Saunders *et al.*, 2012, p. 131). **Subjectivism** means that social phenomena have been created from the perceptions and consequent actions of social actors (Saunders *et al.*, 2009). Between these two aspects, subjectivism has been chosen given that this study aims to investigate whether a particular phenomenon, which in this research is culture, can influence the actions of the social actors (who are the Saudi healthcare professionals) towards the EHR.

In addition, since the ontological position has established our knowledge process, this will bring us to the following philosophical perspective: **epistemology** (Slevitch, 2011). Epistemology refers to the presumption about knowledge, what constitutes knowledge, and how to communicate that knowledge to others (Saunders *et al.*, 2016). Epistemology’s strength lies in its diversity of methods which gives researchers choice with regard to how to conduct their research (Saunders *et al.*, 2016). For example, choosing the interpretivist paradigm will likely result in a qualitative strategy due to its focus on trying to understand human nature and the reasons behind their behaviour (e.g., via interviews, observation and autobiography).

The epistemological paradigm includes three philosophies: **positivism**, **realism** and **interpretivist**, and we will use the latter as the philosophy for this research. According to interpretivists, researchers must understand distinctions in human roles as social actors (Saunders *et al.*, 2016). In addition, interpretivism is associated with the view of phenomenology (Bahari, 2010), which means that humans tend to interpret their lives, health conditions and environment in the best way they can (Saunders *et al.*, 2012).

As such, the interpretivism philosophy fits the proposed research as it will concentrate on the perceptions of people, based on culture, towards IS-driven change initiatives in the Saudi Arabian healthcare sector. Further, Saunders *et al.* (2012, p. 163) indicated that interpretivism is needed as it can “help the researchers to make sense of subjective and socially constructed meanings expressed about the phenomenon being studied”. Interpretivist researchers are curious about the “feeling” (Bahari, 2010), which in our research tries to understand healthcare professionals' feelings towards the EHR system, and how this feeling drives their behaviour.

## 4.2 Research Approach

There are two major types of **research approaches**. The deductive approach is one in which the researcher develops hypotheses based on theory and designs a research strategy to test the hypothesis (Woiceshyn & Daellenbach, 2018), while in the inductive approach, the researcher collects the data and develops theoretical insights as a result of their data analysis (Saunders *et al.*, 2009). Choosing between them depends on the nature of the research question. Therefore, the following paragraphs will outline both and justify our choice of the approach that has been used.

First, the **deductive** approach is defined as “a study in which a conceptual and theoretical structure is developed which is then tested by empirical observation; thus, particular instances are deducted from general influences” (Aliyu *et al.*, 2015, p. 9). Deductive research starts with a theory and hypotheses and tests these with the collected data, while the **inductive** approach is where the researcher will develop their own theory after collecting and analysing their data (Saunders *et al.*, 2015).

Therefore, given the aim of our study, which is to understand healthcare professionals' perspectives about the EHR system and why the healthcare professionals in Saudi Arabia resist using the system, we thought it suitable to use a hybrid inductive and deductive approach. This hybrid approach can be used to connect theory to reality (Hanly, 2014) as they can be used in the same study to harness their individual advantages (Aliyu *et al.*, 2015; Saunders *et al.*, 2015). To illustrate, the deductive approach has been used due to the influence of identity theory during the analysis process, yet we also sought to build



new knowledge by applying thematic analysis (Miles & Huberman, 1994). Additionally, the inductive approach was used during thematic data analysis to create as many themes as possible from the data rather than to make the data fit a specific model. Finally, an inductive approach was followed during the generation of initial codes and when searching for themes. Hence, both approaches were seen in this research as 'complementary' to each other (Woiceshyn & Daellenbach, 2018) and greatly helped us understand and answer our research problem.

### 4.3 Research Strategy

The interpretivist **research strategy**, by its nature, promotes the value of qualitative knowledge in pursuit of data (Chowdhury, 2014): this research will adopt the **qualitative strategy**. Qualitative research is a way to explore and understand what people consider as a social or human problem (Creswell, 2014). Thus, it is concerned with knowing people and why they think or behave in a certain way. Hence, the rationale behind choosing the qualitative approach is that it can efficiently gain culturally specific knowledge and information about particular populations' opinions, behaviours, values and social contexts (Pope & Mays, 2000). This can be done by allowing the researcher to build a direct connection with the participants of the study (e.g., through interviews) (Corbin & Strauss, 2008). This method is required due to the nature of our study, which will focus on the healthcare sector, and how healthcare professionals react to the EHR system.

Mack *et al.* (2005) affirmed that qualitative research had been proven to be significant in improving public health due to the nature of the problems that need to be addressed. To illustrate, they argued that for any related health interventions to be successful, there is a need to properly address the socio-behavioural factors such as cultural norms and people's identities, which a qualitative strategy could provide us with. Another advantage of qualitative methods is that they could explain the complex nature of the people related to the research issue or question. For example, they can provide knowledge about the human side of the problem and the beliefs, opinions or even relationships between individuals.

Moreover, they can effectively identify factors such as social norms and gender roles related to culture, which we need to understand to answer the research question (Corbin & Strauss, 2008). Pope *et al.* (2002) argued that qualitative research could detect the reasons for specific behaviour and help us recognise obstacles to making changes in an organisation; this is what we are trying to investigate in our research. They also pointed out that qualitative methods can provide a possible approach to help organisation managers to recognise issues that need to be considered when launching a new change or “transforming systems of care”, which is what hospitals are trying to do, implementing new technology to improve healthcare (p. 151).

Another aspect of the qualitative approach, according to Khankeh *et al.* (2015), is that it can help us improve our understanding of a specific phenomenon related to a healthcare setting. For example, they commented, "Health knowledge must include interpretive action to maintain scientific quality when research methods are applied". Furthermore, since our research will adopt the identity theory: the qualitative strategy will help us understand complex resistance phenomena. This is because our study needs to understand the complex phenomena (culture) and how they can lead to resistance toward EHR systems.

Finally, despite the appropriateness of the qualitative approach for this research, its selection also presents challenges. A qualitative study is risky (Saunders *et al.*, 2016) and does not promise that the researchers will gain a clear image of the problem; quantitative methods deal with numbers, while qualitative ones deal with images and people’s words (Khankeh *et al.*, 2015). However, regardless of those challenges, to answer our research questions we need to understand those people and the reasons for their actions in order to understand the problem.

## 4.4 Research Design

The qualitative strategy has multiple choices concerning the **research design** such as focus groups, observation, case studies (Table 4.1) and in-depth interviews (Fitzpatrick & Boulton, 1994). In this research, the latter is seen as appropriate as it has been suggested for healthcare-related research (Gill *et al.*, 2008) because interviews seek to

Research Design	Definition	Limitation
<b>Focus group</b>	A group that discusses a particular topic organised for research purposes (Gill <i>et al.</i> , 2008)	<ol style="list-style-type: none"> <li>1- Researcher is considered a discussion facilitator instead of leading and asking questions (Silverman, 2013).</li> <li>2- Data collection is based on a collective view (Gill <i>et al.</i>, 2008), while our unit of analysis is individual.</li> <li>3- The lack of privacy that group interviews contain (Ritchie <i>et al.</i>, 2013).</li> </ol>
<b>Observation</b>	Referred to as the researcher taking field notes about the activity and the behaviour of the participants at the research site (Creswell, 2014).	<ol style="list-style-type: none"> <li>1- Concerned with what is actually happening in a particular setting instead of the participant's view or perception and response to it (Fitzpatrick &amp; Boulton, 1994).</li> <li>2 More appropriate when the investigator would like to "see for himself" what is going on inside the organisation and to "conceptualise" how the organisation operates (Fitzpatrick &amp; Boulton, 1994).</li> </ol>
<b>Case study</b>	Refers to the investigation of a phenomenon in a real-life context (Yin, 1984).	<ol style="list-style-type: none"> <li>1- More interested in the process that took place and its interrelationship (Kothari, 2004, p. 113)</li> <li>2- Not suitable to understand individuals' behaviour.</li> </ol>

**Table 4. 1** Choices of research designs and their limitations.

find out how individuals perceive things, as they can give us access to the 'experience' (Silverman, 2013).

**In-depth interviews** could be defined as a design that helps the researcher uncover the hidden motivations behind a particular behaviour (Kothari, 2004). In-depth interviews are considered one of the leading designs in qualitative methodology (Fitzpatrick & Boulton, 1994), and they are used to explore why participants behave in a certain way (Kothari, 2004). Qualitative research has several possible designs, as we showed previously; however, as we need to understand the phenomenon in-depth. Thus, the in-depth qualitative interview has been chosen to obtain more detailed information because it could help us to gain both breadths across key issues and understand in-depth why these issues arise (Ritchie *et al.*, 2013).

Therefore, the in-depth interview has been chosen in this research for the following reasons, highlighted by Ritchie *et al.* (2013):

1) The interview is interactive in nature, unlike in focus groups where the researcher plays the moderator role. The researcher will ask the question and will give the participant the freedom to answer their question.

2) It can achieve the depth needed by using a follow-up question to get a more profound and fuller understanding of what the participant means. The in-depth format helps the researcher fully explore the factor behind the interviewee's response, such as "reasons, feelings, opinions and beliefs" (p. 141).

3) The interview is generative, and it is more likely that new knowledge at some point would be created, and participants could be asked to give their ideas about how the problem raised during the interview could be solved, which is what we did.

4) In-depth means that the participant should be asked to answer within their language; this would help to get a better depth and meaning to their answer, as the data need to be captured in its "natural form" (p. 142). We have done this by asking our questions in Arabic and English format when needed; we also gave the participants the freedom to use the Arabic language to answer our questions.

In addition, there are various techniques for interviews (Fitzpatrick & Boulton, 1994) (e.g., structured, semi-structured and unstructured). Since our research requires an in-depth understanding of the phenomenon, which illustrates the need to obtain as much detailed information as possible, semi-structured interviews were seen as most appropriate to answer our research questions. Semi-structured interviews allow the researcher to ask supplementary questions when unexpected answers were given (Mitchell & Jolley, 2010). Semi-structured techniques also sought to allow us to explore the complex meanings surrounding identity (Orser *et al.*, 2011), as the purpose of interviews is to explore the views, experiences and beliefs of the individual on a specific matter (Gill *et al.*, 2008; Addington-Hall *et al.*, 2007).

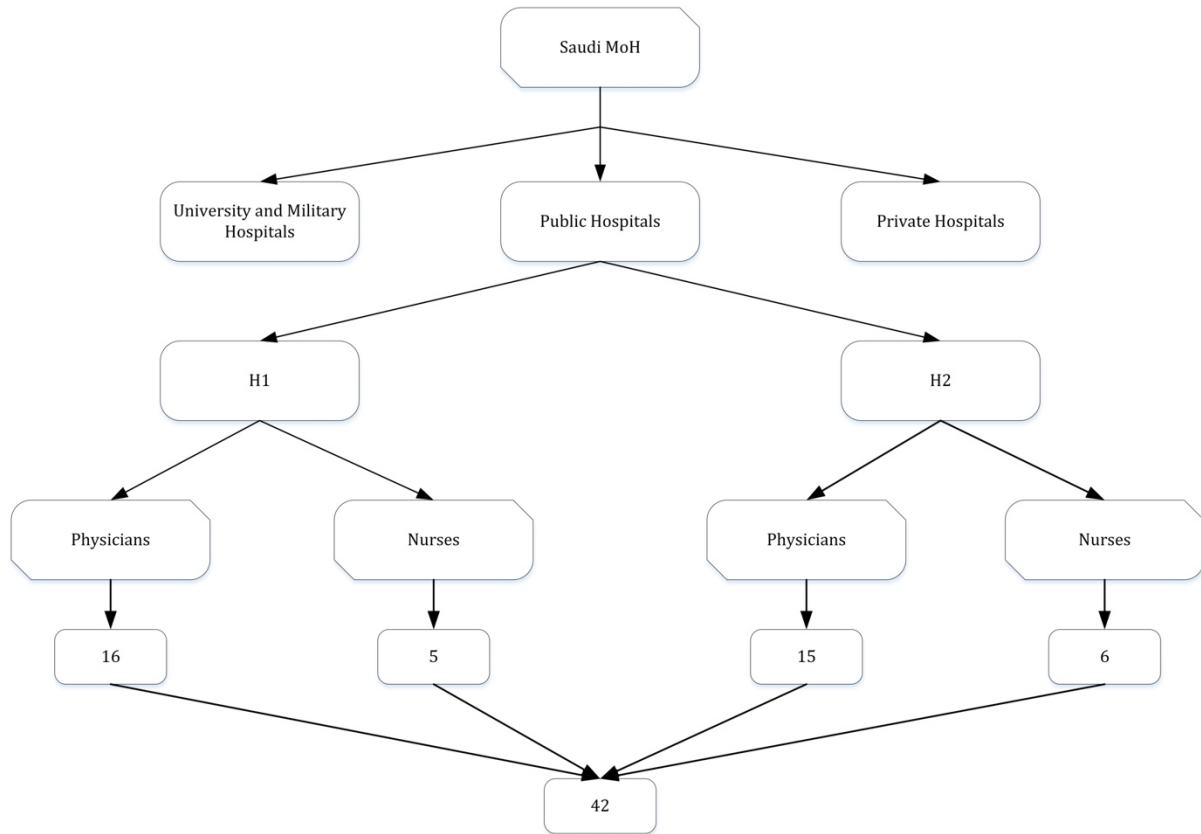
In addition, the nature of our questions as open-ended questions will also give the interviewees the flexibility to describe their feelings and opinions in-depth (Bryman, 2012) and to express their answers in their own way (Saunders *et al.*, 2015). This will help us to better understand participants' views through their rich data response. Therefore, as the main aim of conducting this research is to gain in-depth information about healthcare professionals' views on the EHR system, semi-structured open-ended interviews were deemed appropriate.

## 4.5 Data Collection Planning

After identifying and justifying the appropriate research philosophy, approach, strategy and design in the previous sections, it is time to think about the plan for our data collection process. This phase will be achieved by starting to choose a suitable site, participants, sampling techniques and ethical considerations that would help us to gain access in order to answer our research questions. Thus, we will identify the following: our research site in which our interviewers are available, then suitable participants that are best to answer our research questions, identify sampling techniques to help us recruit our target participants, and finally, any ethical consideration that will help to give us access to the site to recruit participants.

The study's **site** was two major hospitals in Riyadh, the Saudi Arabian capital, and we refer to them in this study as (H1 & H2) to protect the privacy and confidentiality of the

participants and the data-gathering site (Figure 4.3). Both are governmental hospitals, two of the biggest hospitals in Saudi Arabia and were the first in the country to introduce and implement the EHR system into their healthcare operations.



**Figure 4. 3** Model representing the research sample including their numbers in each hospital, and the total number of participants.

Moreover, a further reason for choosing these two hospitals is the presence of our potential suitable participants (physicians and nurses) (Lapointe & Rivard, 2005). Those participants at these specific hospitals are considered among the best-trained and educated healthcare professionals in Saudi Arabia, as most of them were trained in prestigious universities in the US, Canada, Germany and the UK. Besides, Creswell (2007) affirmed the importance of choosing an environment that would make the participants feel more comfortable sharing the information while not wasting their time. Thus, choosing their place of work (the hospital) was the best decision, as they would be available if an emergency arose.

The research **participants** included physicians (Appendix 1) and nurses (Appendix 2) as healthcare professionals. In total, 42 healthcare professionals were interviewed face-to-

face, which enabled us to achieve and address the ROs of this PhD research project. Healthcare professionals are deemed the most appropriate and suitable to gain a rich understanding of their behaviour towards resisting the EHR system. This is because they are the system's primary end-users, and as such, their role as end-user is vital for the successful use and implementation of EHR. Further, it was suggested that healthcare professionals' behaviour is the main reason for EHR failure (Adamson, 2016).

We have adopted Ritchie *et al.'s* (2013) suggestion about choosing the right population for the research data collection. They indicated that two key questions must be fulfilled when recruiting participants. The first question is "Who or what is to be sampled?" As this is the first stage of sampling design, this stage involves identifying "What is to be sampled?" (p. 86), and this usually will involve people, particularly in social research. To answer this question, they advised that three steps must be taken to ensure the right participants, which will be discussed below.

1) Which group is the primary interest in the subject matter for the study? Saudi physicians and nurses have been chosen so they can reflect for us on their experience with a system they engage with daily, along with understanding the culture of the Saudi people and how it can influence their use of and resistance to the EHR system. Additionally, after some initial interviews and analysis, we have realised that consultants have been using resident nurses to resist the system by requesting them to record the information instead of doing it themselves. Hence, recruiting and interviewing resident physicians and nurses was appropriate to understand why consultants behave in this way. This is because some of the consultants would not directly accuse themselves of resisting the EHR system because they request lower-ranking physicians and nurses to record information on their behalf to avoid medical errors. This emphasises Creswell's (2007, p. 133) suggestions regarding the importance of recruiting participants who are willing to be open and honest in sharing information and their story.

2) Are there subsets of the central population that should be excluded? This means that some people with specific circumstances make them inappropriate or even insensitive to include in the study. My part as the researcher was to ensure confidentiality for the

participants, which I will discuss later in the ethics section. However, we ensured that no participant was in a vulnerable situation to do the interview.

3) Is there an additional group that should be included because of their viewpoint or experience and who would bring contrasting or complementary insight into the research? As discussed earlier in the first point, I have decided to ensure that I include the resident physicians after the initial analysis of the first interviews revealed that consultants sometimes use their power to abuse the resident physicians. Hence, this new group has been added to ensure that we can listen to their experience and story. Ritchie *et al.* (2013) also asserted the need to specify the categories of staff and ensure that their functions are close to the research-specific question.

The second question from Ritchie *et al.*'s (2013, p. 86) suggestion is, "What is the appropriate information source or sample frame from which they are to be selected?" The target population could be identified in different ways, yet not all populations will be appropriate for the study. Hence, they suggested several criteria to judge the suitability of the population:

1) Does the sample frame in the first question provide the details required to inform our selection? I believe that we have thoroughly investigated the stakeholders and the people we need to get our rich information from, which will be seen in our data analysis chapter.

2) Will our sample frame provide a sufficient number of potential participants? This concern has been solved by finding the saturation point during our data analysis.

3) Is the time and cost of using the sample justifiable? Because if the work requires considerable time and cost to identify the participants, it might be necessary to do another population frame that could be more suitable. However, the time and cost were appropriate for our study to answer the question.



In addition, concerning the sampling techniques, the type of **sampling**<sup>17</sup> approach used in this research was purposeful sampling. The importance of identifying a sampling type in any research is because researchers cannot study “everyone, everywhere, and doing everything” (Punch, 1998, p. 193). Hence, a sampling decision must be taken earlier and be accurate to help the scholar in answering their specific research questions (Khan, 2014).

**Purposeful sampling** could be defined as a way in which the researcher will select their participants and study site because they can purposefully help to understand and answer the research problem (Creswell, 2007). Purposeful sampling is an excellent technique to investigate and get a deeper understanding of the phenomenon under study, as it can give detailed information (Khan, 2014). Purposeful sampling also requires access to key stakeholders in the field of the research because they can help us to get rich information (Suri, 2011), which is why we have chosen physicians and nurses because they are the primary end-user, and are a critical aspects of the EHR's successful implementation.

However, according to Khan (2014), purposeful sampling is divided into three main types; one of them is snowball sampling, which we selected to do to our research as it is a valuable technique for reaching potential participants. Further, we have followed Khan’s (2014) approach as the subject of investigation is a sensitive topic culturally, and healthcare professionals who admit to resisting the system, if known, could be accused of purposely sabotaging the EHR system by Saudi hospitals<sup>18</sup>.

Snowball sampling is a term used for an approach involving asking people who have already been interviewed to identify other people they know who fit the selection criteria (Ritchie *et al.*, 2013, p. 94). This approach has been used because of the difficulties of gaining access to the healthcare professionals' offices in the hospitals, which require an electronic card to pass through the doors. Therefore, in the beginning, the researcher used his personal contacts and social networks to reach healthcare professionals, and

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<sup>17</sup> Sampling refers to the way of understanding a specific group of people by choosing a limited number of them to study (Khan, 2014).

<sup>18</sup> Privacy was taken into consideration by protecting participants' identities.

after finishing the interviews with them, he asked them if they could suggest or bring any other healthcare professionals who may be interested in helping with the study.

In addition, using the snowball technique allowed the researcher to have another round of healthcare professionals' interviews. However, the disadvantages are that we had to trust our initial contacts' judgment, which might introduce bias (Bell *et al.*, 2022). For example, when I conducted the first interview, I asked the interviewee to suggest another physician. Hence, he referred me to his colleague who is his age, and I understood that he might be his friend and they may have graduated together, resulting in both being of the same age. This might be a bias in terms of the participant's age. Thus, to mitigate this problem, the researcher intentionally sought to diversify his set of nominees to allow additional candidates, hence, not taking several sample nominations from the initial contact (Saunders *et al.*, 2009). Also, the researcher conducted as many interviews as possible until data saturation was reached.

After confirming our two research sites, participants and sampling techniques, it is now the time to start thinking about gaining access to the sites and to our chosen participants. Thus, before any data is collected the researcher must think about gaining access, and any relevant ethics, as they are critical components for the success of any research project (Saunders *et al.*, 2015). Therefore, in the following few paragraphs, we will illustrate the ethical considerations that have been followed to grant access to collect our data.

Prior to any data collection, **ethical consideration** has been considered, including informed consent, assurance of confidentiality, anonymity and the choice for participants to withdraw from the interview within two weeks after it took place. Ethical issues are important in quantitative and qualitative research; however, it is more important in qualitative research as the researcher often tries to obtain deeper and private information from the participants (Khan, 2014).

As such, this research adhered to Lancaster University's rules about gaining ethical approval from the university before any data was collected. Hence, an ethical approval application was submitted and granted before starting the data collection, which was obtained from the Lancaster University Management School (LUMS) and the Faculty of

Arts and Social Sciences (FASS) Research Ethics Committee. Ethics approval was granted on the 20th of December, 2019 (Appendices 3, 4, and 5 for the Participant Information Sheet, the Interview Guide and the formal approval email).

The second approval was gained from the Central Institutional Review Board (IRB) at the Ministry of Health (MoH) in Saudi Arabia after submitting the required documentation, letters and a brief research proposal description. This step was required to gain permission to carry out the study and to obtain support from the MoH in Saudi Arabia to conduct interviews at the hospitals we targeted. The approval was granted on the 3rd of November, 2019. The third approval was also guaranteed after submitting the relevant documents from Hospital 1's (H1) Institutional Review Board (IRB); it was also issued on the 3rd of November, 2019. The reason this hospital needs to have separate IRB approval is that it has its own IRB committee.

Finally, to ensure the confidentiality and anonymity of participants, the researcher ensured that all the participants in this research were labelled differently (e.g., H1P1). They have also been given a sufficient description of the study before agreeing to participate. This has been done by giving the participants an information sheet that will allow them to read more about the research and the expected outcomes. They were also given a consent sheet to ensure their approval to be part of the study before starting the interviews and recording their answers.

## **4.7 The Data Collection Process**

Data collection took place from the 1st of January, 2020 until mid-March 2020, and from June 2020 until July 2020. We had two periods of data collection because of the Covid-19 pandemic, as we had challenges recruiting participants and going to the hospital to look for participants. Hospitals in Saudi Arabia during that time were not allowing anyone other than hospital workers and patients to enter the hospital. Further, a strict 24hr curfew took place for almost two months in Saudi Arabia, and we could not leave our homes.

For the data collection, the healthcare practitioners were approached during and after office hours. They were given a participation information sheet one day or more in

advance of the interview to give them an idea about the research project and problem. The interviews have been respectful of the cultural norms of the participants. For instance, when interviewing female participants, the door was kept open during the interview. Also, all participants were approached after or before prayer time. All interviews have been audio-recorded (with permission from participants) to preserve an accurate account of the interview, which could be replayed for analytic purposes. Finally, after each interview, the researcher transcribed it into a Word file and translated it to English if necessary.

After each interview, it was essential to thank the participants and ask them whether they had anything to add to the conversation (Gill *et al.*, 2008). Hence, the researcher thanked the interviewees and asked them if they had anything else they would like to add. The importance of asking the participants whether they had anything to add is that it could be an opening to new and unanticipated information or discovery (Gill *et al.*, 2008).

## **4.8 The Post-Data Collection Process**

### **4.8.1 Data Transcriptions and Translations**

All interviews were audio-recorded using the researcher's iPhone recorder (with permission from the participants) due to the importance of the interview being recorded for later transcription and data analysis (Gill *et al.*, 2008). The advantage of using the researcher's iPhone was to allow an easy and immediate transfer of the audio files to the computer and the researcher's account in OneDrive on secure Lancaster University servers. Using the iPhone to record our interviews gave the researcher the flexibility to go back and forth during the transcription process.

Furthermore, audio recordings allow the researcher to devote their full attention to what the participant was saying and take notes when needed. An audio recording also provides an accurate recording of the interview that could capture the meanings behind participants laughing or hesitating (Ritchie *et al.*, 2013). However, despite some challenges of privacy that we have faced during recording, in which the participant at the beginning shows hesitation when they know the interview will be recorded, it was seen

to be the best method for recording data due to the advantages that were discussed in the last paragraph.

In addition, according to Ritchie *et al.* (2013), having spare audio recording equipment was essential in the interview process. Therefore, the researcher equipped himself with another fully charged phone before every interview meeting in case the main iPhone was not able to be used. The student's supervisor also gave him a spare audio recording with a microphone to use when needed. This is because a decent-quality recording is essential (Ritchie *et al.*, 2013).

#### **4.8.2 Data Analysis**

Once the researcher has gathered the data, reading and interpretation are the starting points for meaningful analysis (Bazeley, 2009). It is the final stage of the interview process (Turner, 2010) and the most complex of all of the phases of a qualitative project (Kiger & Varpio, 2020). Thematic coding analysis (TA) was utilised in this research to analyse our data due to its potential for revealing the complexity of "thick data" (Miles & Huberman, 1994). The TA is defined as "the process of encoding qualitative information" (Boyatzis, 1998, p. 4).

Qualitative data are usually "voluminous and messy", making the need to reduce this data an essential process (Ritchie *et al.*, 2013, p. 202). Hence, according to Rivas (2012, p. 367), TA helps reduce the data and organise them for easier understanding. Thus, TA is suggested due to its ability to improve the quality of results (Boyatzis, 1998), as the primary goal of TA is to recognise themes and patterns in the data that are significant or interesting and use these themes to address the research issue (Maguire & Delahunt, 2017).

In this thesis, we have followed Braun and Clarke's (2006) approach, which lays out six steps to conducting successful thematic data analysis and has been widely adopted for TA within qualitative literature (Kiger & Varpio, 2020). The selection of this approach is for the following reasons, a) it will help us to get a deeper insight into the data during familiarisation, b) it will make the process of coding quicker and easier, and c) it will

generate high-level themes that require less refining and reviewing (Braun & Clarke, 2012). The following section will summarise our six steps in this study to analyse our data.

### 4.8.3 Data Analysis Steps

Braun and Clarke (2006) introduced the six-step process to analyse qualitative data; these steps will be summarised in (Table 4.2).

Stage	Description of the stage
<b>First-</b> Familiarising yourself with the data	This stage requires the researcher to read and re-read the transcript to have an initial thought about the data
<b>Second-</b> Generating initial codes	This stage requires the researcher to generate initial and interesting coding from the data through collecting the relevant data for coding
<b>Third-</b> Searching for themes	This stage requires the researcher to convert initial codes to initial themes and collect all data connected to those themes
<b>Fourth-</b> Reviewing themes	This stage reviews the themes and whether they are linked to the extracted code and entire data set, along with generating a thematic map of the analysis
<b>Fifth-</b> Defining and naming themes	This stage requires the researcher to review their emergent themes, see whether they fit the research question, and that they hang together as a coherent story. Also, at this stage, each theme should be defined
<b>Sixth-</b> Producing the report	This is the final stage of the Braun and Clarke TA process. It requires the researcher to write up their final story about the themes with a vivid example

*Table 4. 2 Braun and Clarke's steps to analyse qualitative data.*

#### Familiarising yourself with the data

Familiarising myself with the data as a researcher started from the first step, which was during the interview stage. This is because Braun and Clarke (2006) encouraged the researcher to collect their data interactively and by themselves to help establish prior knowledge during the analysis stage, and they recommended taking notes when needed during the interview. The researcher followed this suggestion by collecting the data

interactively with interviewees (face-to-face), taking notes and observing them when they explained or answered the questions.

Furthermore, the process of transcription, despite its challenges such as being time-consuming and frustrating, can be said to be an excellent way for the researcher to familiarise themselves with their data (Riessman, 1993; Kiger & Varpio, 2020), and some have argued that it is a crucial stage during data analysis (Braun & Clarke, 2006). As a researcher, I have followed the suggestion to familiarise myself with my data during the transcription phase through transcribing all my audio interviews myself, and translating some of them from Arabic to English, which helped me to gain a better understanding of what the interviewer said and meant.

Repeated reading is also an excellent exercise for the researcher to familiarise themselves with their data (Braun & Clarke, 2006). This has been achieved while ensuring the accuracy of my transcription; I listened to and read each interview at least twice, which helped me with an initial impression of the data, and, consequently, get a more in-depth understanding. Further, during each transcription reading and listening, initial notes were taken when the researcher felt the importance of what the interviewee was saying; that helped me later in my data analysis process.

These steps helped me familiarise myself with the data when I immersed myself in it during the transcription reading and enabled me to highlight patterns and meanings. This has helped to get the depth and breadth of the collected data. This process gave me a good understanding of an initial code that was then transferred later into themes, by highlighting the text which I believe could be relevant to my research question (Figure 4.4), while being open to more options for my inductive analysis.

**Q5. As a physician what information should be stored in the system?**

All the clinical encounter, all the clinical data, previous medical incise, medication side effect which we really needed it in a quick way.

**Q6. What information should not be in the system, and why? 03:00**

The extensive formal official paper work shouldn't be in the system, like for example, consent it could be grouped in other place where it is not offloading the system going through these things.

**Figure 4. 4** Example of how the extract has been done by highlighting with multiple colours participants saying.

## Generating initial codes

After reading and re-reading the transcript, and highlighting a number of sections of text that were deemed interesting, I started to note some patterns in the data (Figure 4.5). This brings us to the next phase: generating initial codes from the data. Codes refer to the “most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon”, and it is part of the analysis to organise the data into a meaningful set (Braun & Clarke, 2006, p. 88).

Interview	Codes
<b>N 1</b> <ul style="list-style-type: none"><li>I don't think I am allowed to share patient information; it is patient privacy. I think it can help the insurance company more than organization as us. For me I think it is will harm the patient.</li></ul>	<ul style="list-style-type: none"><li>Privacy</li><li>Patient's Information</li><li>Professional Values</li><li>Patient's Preference</li><li>Patient's best interest</li><li>Patient Safety</li></ul>

*Figure 4.5 Example of how the interview extracts have been initially coded.*

There are two ways to perform coding analysis, either manually or through a software programme such as (NVivo). However, Fade (2003) suggested that manual coding helps get a deeper understanding of the data. Hence, the coding process of our data was done manually without using software such as (NVivo) and by doing so, it helped in getting an in-depth understanding of the data. The only software used was Microsoft Word to help highlight the text.

Furthermore, Braun and Clarke (2006) suggested that all data should be coded as they might be helpful, and this phase of the coding process might involve copying extracts of the data from transcripts to use during the process. Therefore, both suggestions have been considered as all the extracted data has been coded, and the coding process has two levels. The first level was data-driven and the second was theory-driven. This is because, as discussed in the methodology section, this research adopted inductive and deductive approaches during the data analysis process. For example, during the data-driven process, the resistance due to a lack of training sub-theme has been highlighted and linked to the data as it was not a theory-driven finding, while during the theory-driven phase, codes such as professional skill being affected have been highlighted because they



can easily fit into the professional identity theory. In addition, Figure 4.5 shows how a big section of the data has been used in the coding table to help with the coding process.

### Searching for themes

This stage starts when the researcher has coded all their data, with a long list of codes generated across the data set (Braun & Clarke, 2006), which I have done. Hence, this phase includes re-focusing the analysis on generating themes rather than codes (Braun & Clarke, 2006). Therefore, after producing a long list of my codes, these codes were reported to the supervisors, who provided guidance and advice such as reducing the number of themes and how they can help with data analysis. The theme reduction process aimed to gain an in-depth view of the data and form a high-level theme representing codes to create a coherent story for the data. (Figure 4.6) shows an example of the process of generating high-level themes.

<p><b>Professional autonomy affected negatively</b></p>	<ul style="list-style-type: none"> <li>• Professional autonomy in decreasing their flexibility</li> <li>• Professional autonomy in their job efficiency</li> <li>• Professional autonomy in less authority</li> <li>• Professional autonomy of being monitored</li> <li>• Professional autonomy of more work load</li> <li>• Professional autonomy increases paperwork burden</li> <li>• Professional autonomy in more restriction</li> <li>• Professional autonomy in making decisions</li> </ul>
<p><b>Professional identity role threatened</b></p>	<ul style="list-style-type: none"> <li>• Threatened from having more paper work</li> <li>• Threatened from less authority</li> <li>• Less flexibility</li> <li>• More surveillance</li> <li>• Interfering in medical decision</li> <li>• Patient information not confidential</li> <li>• Sharing patient information with administrators</li> <li>• Threatening physician image among patient</li> <li>• Perception of own or other's role</li> <li>• Professional pride</li> </ul>

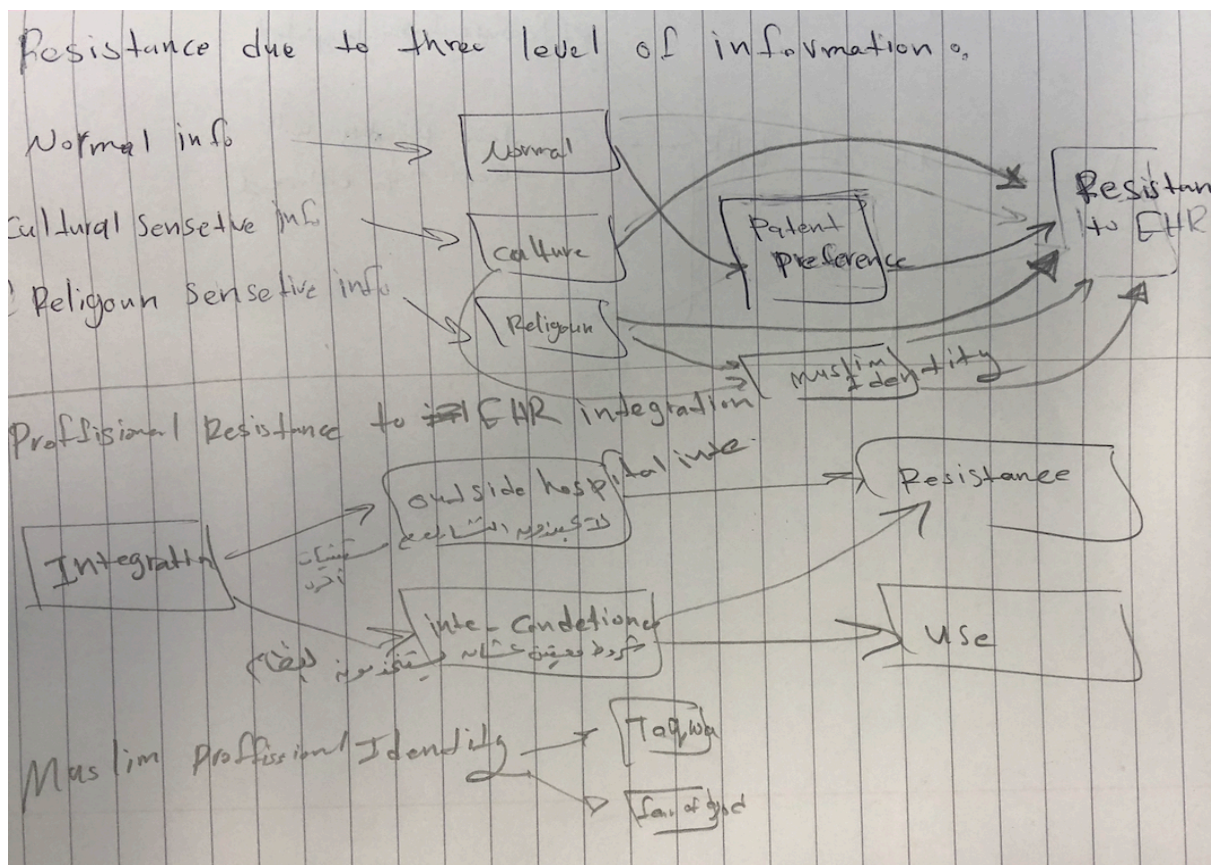
**Figure 4. 6** Example of how themes have emerged from the codes.

As such, the student started to analyse and reduce the codes to form a different theme, as the themes do not simply emerge from the data; instead, the themes are constructed through analysing the codes (Kiger & Varpio, 2020). Using tables is deemed helpful as a visual representation in order to sort different codes into themes (Braun & Clarke, 2006).

Hence, following this advice, a table has been used to identify codes and themes, with five iterations performed to gain a comprehensive set of themes.

### Reviewing themes

This stage is about quality-checking the codes and developing themes to ensure they are relevant to the coded data and the entire data set (Braun & Clarke, 2012). Therefore, for the researcher to make sure about their codes' and themes' quality, Braun and Clarke (2006) suggested a two-level assurance process, which we have used to help us review and refine our themes. The first level involves reviewing the level of coded data extracts (Figure 4.7), and the second involves reviewing the level of coded data concerning the entire data set, and we will discuss each level in the next paragraph.



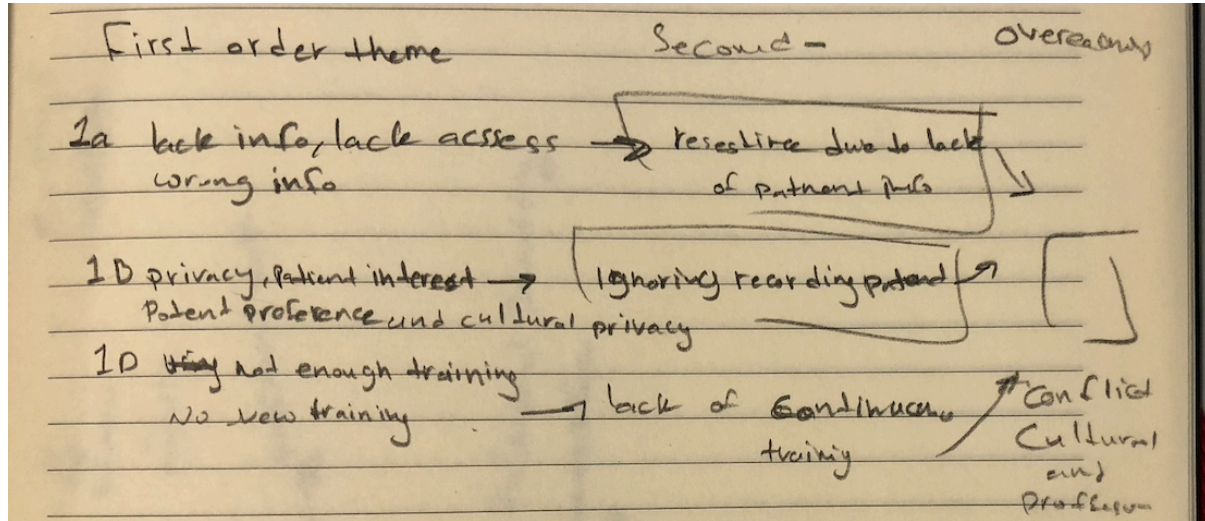
**Figure 4. 7** An example of one of the researcher's notes on making sure each theme is connected to codes.

The first level ensures that emergent themes align with the extracted data (Braun & Clarke, 2006). This has been illustrated in different analysis waves as some themes were re-allocated to another theme or discarded (Figure 4.7). The second level is to check

whether the set of themes does reflect the entire data set. This can be done by having another reading of all the data sets (Braun & Clarke, 2006). This stage is essential because once the researcher finishes with it and is positive about the accurate reflection of the theme with regard to the entire data set, they will have a “fairly good idea” about the story behind the data (Braun & Clarke, 2006). This has been done through multiple readings of the data set, along with supervisors' comments and guidance through the process.

### Defining and naming themes

After having the set of themes checked for their quality, this stage is about defining and refining the themes. Defining the theme means “identifying the essence of what each theme is about and determining what aspect of the data each theme captures” (Braun & Clarke, 2006, p. 92). Therefore, by following Braun and Clarke’s suggestion for this phase, each theme in this research has been analysed and reviewed to ensure it fits with the story and has been defined to ensure what the theme represents and what it does not (Figure 4.8).



**Figure 4. 8** An example of the researcher's notes on defining and naming themes.

### Producing the report

This is the final stage, and it begins when the researcher has all their final themes and analysis ready to write the report. The report is produced to show the reader the complete picture of what has arisen from the collected data, and narratively discuss,

analyse and interpret them to answer the research questions (Braun & Clarke, 2006). To fulfil this suggestion, they recommend the researcher choose “particularly vivid examples or extracts that capture the essence” of the point being told (p. 93). Therefore, this suggestion was followed by writing a report in the form of the Findings and Discussion Chapter as part of my PhD Thesis. These chapters have used extracts and examples of my data to explain and tell a story about why and how Saudi healthcare professionals resist the EHR system. Further, a vivid example of an extract supported the researcher's argument when discussing his data.

## **4.9 Research Rigour**

Qualitative research has been criticised mainly because of how its quality is measured (Miles *et al.*, 2018; Appleton, 1995). Hence, qualitative researchers offer many concepts that can help assess the quality of any given qualitative research (Yin, 2013). Therefore, in this section, we will discuss these concepts to assess the quality of this research by adapting Miles *et al.*'s (2018) approach (Table 4.3). They proposed five criteria that could be a guideline to be considered when this research is being asked: “How good is this research report?” (p. 271). These criteria are confirmability, dependability, credibility, transferability and utilisation. Next, we will discuss each one of them individually.

### **4.9.1 Dependability**

Dependability refers to how findings could be stable over time (Anney, 2014). According to Miles *et al.* (2014), this could be achieved by ensuring that data were collected at a proper site, time and with a suitable respondent. This condition has been met by collecting the data in a hospital where our potential and desired respondents work. Further, the researcher approached the participants at an appropriate time for the interviewees.

Miles *et al.* (2014) and Anney (2014) have also suggested peer examination, where the researcher discusses their data with a colleague, for example. This has been achieved through discussing the data with the student's supervisors. In addition, Lincoln and Guba (1985) proposed the concept of auditability to increase the dependability of the research.

<b>Design Quality Criteria</b>	<b>Recommended Criteria</b>	<b>Action Taken</b>
<b>Dependability</b>	<ul style="list-style-type: none"> <li>a. Collecting data at the proper site, time and having a suitable respondent</li> <li>b. Peer examination</li> <li>c. Auditability</li> <li>d. Skills of the researcher to perform an interview</li> </ul>	<ul style="list-style-type: none"> <li>a. Data were collected from the primary users (P and N) in their natural place of work (hospital)</li> <li>b. Discussing data with supervisors, departmental committees and in an international conference</li> <li>c. Thick descriptions were provided, including the cultural context</li> <li>d. Research trained through taking classes and online and face-to-face sessions</li> </ul>
<b>Credibility</b>	<ul style="list-style-type: none"> <li>a. Prolonged engagement</li> <li>b. Peer debriefing</li> </ul>	<ul style="list-style-type: none"> <li>a. Engaging with participants in their setting and understanding their cultural context</li> <li>b. This has been achieved through: <ul style="list-style-type: none"> <li>-having annual meetings from the student's department to discuss the researcher's progress</li> <li>-receiving feedback from supervisors</li> <li>-participating in conferences and gaining feedback from two of them</li> </ul> </li> </ul>
<b>Transferability</b>	<ul style="list-style-type: none"> <li>a. Thick description</li> <li>b. Doing a purposive sampling</li> </ul>	<ul style="list-style-type: none"> <li>a. The researcher gave detailed information about the participants</li> <li>b. The researcher recruited suitable participants</li> </ul>
<b>Confirmability</b>	<ul style="list-style-type: none"> <li>a. Presenting interview questions to colleagues</li> <li>b. Presenting analysed data to colleagues</li> <li>c. Having multiple sources of data collection</li> <li>d. Audit trail</li> </ul>	<ul style="list-style-type: none"> <li>a. Research questions presented to supervisors</li> <li>b. Presented and discussed analysed data with supervisors</li> <li>c. Data collected from two hospital sets and multiple participants with different medical backgrounds</li> <li>d. All research activities about how the data was collected, recorded and analysed are safely stored in Lancaster University's OneDrive Cloud</li> </ul>
<b>Utilisation</b>	<ul style="list-style-type: none"> <li>a. Physical and intellectual access to the findings by potential users</li> </ul>	<ul style="list-style-type: none"> <li>a. Part of the research analysed data published at an international conference, and a PhD Thesis will be submitted to Lancaster University Library</li> </ul>

**Table 4. 3** Summarising steps taken for the research to establish rigours by adapting Miles et al.'s (2014) approach.

They suggested that a study could be judged as auditable and reliable if the reader can follow what they called the “decision trail” of the research process (Appleton, 1995).

Hence, this study has been written with detailed description to allow the reader sufficient details and information to check the decision trail. Further, as the reliability of the research depends on the data collected, and the method to collect the data was interviewing, this means that the reliability of the data depends mainly on the ability and skills of the researcher to conduct the interviews (Appleton, 1995). Therefore, to increase the reliability of the collected data and the interview skills, the researcher took classes and online sessions to gain experience in interviewing and watched a YouTube video about conducting an interview.

#### **4.9.2 Credibility**

Credibility is defined as how research findings can be trusted or how they represent the truth of the data collected (Anney, 2014). Many ways have been suggested to improve research credibility, including prolonged engagement in the field or research site and the use of peer debriefing. The first requires the researcher to immerse themselves in their participants’ worlds (Anney, 2014). This was implemented through the researcher actively engaging with physicians and nurses by sitting with them when prescribing medication or during an emergency, and witnessing how they are suffering from using the EHR system.

Further, the use of peer debriefing means seeking support from other professionals that are willing to provide scholarly guidance (Anney, 2014), such as members of academic staff. This was achieved in two ways; first, the researcher has gone through three annual review meetings with two internal academic experts in the field, along with his two supervisors during the meeting. Next, the researcher explained his research, data collection and data analysis during these meetings and received feedback and guidance from the meeting committee. Thirdly, the student has been sending his supervisors his work and receiving feedback on every aspect of the research work.

### **4.9.3 Transferability**

Transferability refers to how the study findings could be applied or transferred to another study context (Lincoln & Guba, 1985). To achieve this criterion, Anney (2014) has proposed two processes: first, by providing a thick description, and second, by doing purposeful sampling. This means that the work of transferability is done by the readers and consumers of the research, as they are who “transfer” the result through evaluating the information that the researcher has provided them with (Polit & Beck, 2010). The following paragraph discusses the tools suggested by Anney (2014) to achieve research transferability.

First, by providing a thick description, which refers to “rich, thorough descriptive information about the research setting study participants”, methods and the context (Polit & Beck, 2010, p. 1453). The detailed description will help other researchers to replicate the study with similar conditions in other settings (Anney, 2014). The researcher gave detailed information about the number of participants, their gender, religion, context, position, ranking and medical majors (Appendices 1 & 2). The researcher has also mentioned the type of hospital setting participants work in (Figure 4.3), the country and the city.

Second, purposeful sampling was carried out which helped the researcher answer his research question and recruit the most suitable participants (P & N) with knowledge about the EHR as they are the primary end-users of the system. Further, as the interviews progressed, the researcher noted that the higher the physician’s rank, the better information could be gained. Hence, the researcher has mainly focused on interviewing more consultants or fellow physicians when available due to their long experience with the EHR system.

### **4.9.5 Confirmability**

Confirmability concerns the researcher’s bias and whether it has influenced their research findings (Miles *et al.*, 2018). Confirmability is the process undertaken to reduce the researcher’s bias (Appleton, 1995, p. 996). It has been argued that researcher bias

greatly influences qualitative data. However, Gray (2021) has responded to this criticism that research and data analysis cannot be totally isolated by the researcher's biases which have been built based on their experience and the context in which they grew up.

Therefore, many researchers have suggested steps to reduce researcher bias, including presenting interview questions and analysed data to colleagues (Gray, 2021). Others, such as Denzin and Lincoln (2011), stated that multiple sources of data collection could help with confirmability. Hence, the researcher followed these suggestions and presented the interview questions to his supervisors to ensure whether they were suitable for the research project and then it was edited based on the supervisors' suggestions. Further, the researcher did his data analysis individually and then presented them to his supervisors to discuss the analysis, which helped reduce researcher biases. Multiple data sources have also been achieved by interviewing 42 participants in two different hospitals.

In addition, Lincoln and Guba (1985) suggested the audit trail process to ensure confirmability, which indicates that the "researcher accounts for all the research decisions and activities to show how the data were collected, recorded and analysed" (Anney, 2014, p. 278). The researcher kept all his interview recordings at Lancaster University's OneDrive digital cloud, as discussed earlier and has presented all the processes of data analysis and discussion by using Braun and Clarke's (2006) approach. We have also kept detailed records of how we analysed our data by memo writings or diagram drawings. This is an essential part of the audit trail to ensure that peers have enough details to follow and understand the logic behind each decision made (Fade, 2003). Finally, Nowell *et al.* (2017, p. 3) stated that confirmability could not be established until credibility, transferability and dependability are all achieved, which the researcher has attained and established in the above paragraphs.

#### **4.9.6 Utilisation**

Miles *et al.* (2018, p. 279) argued that even if the study's findings are valid and transferable, how can we know for sure that the study can benefit both researchers and its consumers? Hence, he proposed that the findings can be accessed physically and



intellectually by its potential users. This will be done by aiming to publish the study findings in a journal, and a copy of the original PhD thesis will be stored at Lancaster University's library. To follow the advice, the researcher started to publish his work by having a paper accepted and published at the Pacific Conference on Information Systems (PACIS) 2022.

## **4.11 Chapter Summary**

This chapter explained and justified the research philosophy and approach followed by the research strategy. Next, we presented our data collection planning in detail by explaining our choice of site, participants, tools and sampling procedures used in this research. The data collection process has been presented, followed by a description of our data analysis process. Finally, the chapter provided details of and addressed the research rigour and quality issues and how they were avoided in this study. This chapter serves as the basis for the detailed findings chapter, which follows.

# Chapter 5

## Findings

This chapter will present the findings from the interviews gathered during the course of the study. A total of 42 interviews were performed with physicians and nurses as participants from two large hospitals in Riyadh, Saudi Arabia. The chapter is outlined in three main sections that consist of the Research Questions:

**RQ1** How does the use of EHR influence healthcare professionals' identity in Saudi Arabia?

**RQ2** How can change in professional identity explain resistance to EHR for healthcare professionals in Saudi Arabia?

**RQ3** How can the use of EHR influence the relationship between patients and healthcare professionals in Saudi Arabia?

Each section will present the major themes and then sub-themes that have been generated during the coding process. The purpose of this chapter is to present our understanding of the Saudi Arabian healthcare professionals' perspectives regarding the EHR system.

### **5.1 How does the use of EHR influence healthcare professionals' identity in Saudi Arabia?**

This section presents the emergent themes from the physicians' and nurses' interviews and responses to the research question. RQ1 *How does the use of EHR influence healthcare professionals' identity in Saudi Arabia* has been driven by the need to understand the influence of EHR on identities (Nach, 2015). Additionally, the need to understand the motives behind the emotional reactions of resistance and its motives (Lapointe & Beaudry, 2014; Maillet *et al.*, 2015).

In addition, we will examine the users' adverse reactions and their ambiguousness towards an implemented EHR system to see if it may negatively affect them professionally (Lapointe & Beaudry, 2014). Moreover, there is a notable gap, mainly

because of the need to understand a different professional culture to understand their response to the reforms (Dadich *et al.*, 2015, p. 321), which the Saudi Arabian context could provide us with.

For RQ1, physicians and nurses highlighted and expressed their concerns regarding how using the EHR system influences their professional identity as healthcare professionals. These concerns were raised during interviews, showing differences in how they influenced both healthcare professionals. Hence, a total of five major themes have emerged, with several associated sub-themes which are shown in bold italic font (Table 5.1). The following sub-sections will explore the evidence in more detail and will be structured by major themes, which take account of responses from both types of healthcare professionals.

<b>Major Themes</b>	<b>Sub-Themes</b>
Systems influence healthcare professionals' work	(P)
	<ul style="list-style-type: none"> <li>• Making job harder</li> <li>• Clinical care affected</li> <li>• Wrong indication about patients' condition</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• No hard copies of patients' information</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• Medical judgment affected</li> </ul>
Healthcare professionals' beliefs in their job	(P)
	<ul style="list-style-type: none"> <li>• Their belief in how to be a healthcare professional affected</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• Commitment to being an actual nurse</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• Patients' privacy was violated</li> <li>• Patient satisfaction is affected</li> </ul>
User interface design	(P)
	<ul style="list-style-type: none"> <li>• Lack of standardization</li> <li>• The system is not designed for healthcare professionals</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• EHR system is complicated</li> </ul>

The system is re-structuring professionals' traditional role	(P)
	<ul style="list-style-type: none"> <li>• The EHR system is threatening physicians' authority</li> <li>• Physicians' authority stolen</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• EHR system has promoted their profession as a nurse</li> <li>• The system is legally saving them</li> </ul>
The system categorisation of the healthcare professionals	(N)
	<ul style="list-style-type: none"> <li>• Less access to patients' information than physicians</li> <li>• System making nurses more dependent on physicians</li> <li>• Nurses are treated differently than physicians' because of the system</li> <li>• Nurses are asked to check their system every hour or two, unlike physicians</li> </ul>

**Table 5. 1** RQ1 Emerged themes and sub-themes (P= Physicians & N= Nurses)

### 5.1.1 The System Influence on Healthcare Professionals' Work

The first theme that emerged during the interviews was the **system's influence on healthcare professionals' work**, and many sub-themes followed, such as *how the system made the job harder, clinical care was affected* and *wrong indication about patients' conditions* when it comes to physicians. Nurses highlighted that there were **no hard copies of patients' information**, and both types of healthcare professionals expressed how **their medical judgment was affected**.

It is widely understood that healthcare professionals, including physicians and nurses, work hard to successfully establish and maintain a unique and essential professional identity through their long education (Goltz & Smith, 2014). Hence, professional identity is critical to these people's sense of self: "It is about connecting with roles, responsibilities, values and ethical standards unique to a specific profession" (Goltz & Smith, 2014, p. 1). For example, in many cases, the physician participants reported that **the system is making their job harder** than it should be, or used to be, because of the *inability to order medication when needed, access some information, and how other healthcare professionals' notes are not clear nor completed*. Consider what H2P1 said:

*“What I cannot access is more, like, to carry on the plan, is some investigation which I cannot order, and it has to be ordered from seniors. For example, doing the MRI, I cannot order it myself, it must be done through a consultant.”*

Here, the participant expressed how he is unable to carry on his job without waiting for another colleague to confirm his MRI request for his patient. The interviewee highlighted his dissatisfaction with the fact that he, as a healthcare professional, is unable to completely fulfil his job for his patient. This is supported by another participant when H2P2 said: *“I have limited access.”*

The interviewee above stated that he could not access patient information due to access limitations from the EHR system, which made him feel that he would not be able to understand the big picture about his patient. In addition, the lack of access to patients' information has been caused by other healthcare professionals who are not using the system or not completing their patient's documentation. This could lead to several problems, for instance, with other departments that might need to know the medical symptoms/ailments the patient is facing. H2P3 describes an example of this:

*“Things such as being late in the transcription process, especially in the operation notes, the surgeons they do an operation, and they dictate a report which takes sometimes two or three weeks to be transcribed; therefore, you don't have data about the patient. So, you will need to call somebody to verify what has been done to the patient.”*

In addition, H1P11 advised that the lack of adherence to business processes, such as data entry about the patient, negatively impacts their ability to use EHR and, ultimately, their performance in their clinical role(s). This is succinctly stated by H1P11: *“People come to us in a critical condition, and we cannot help [...] The right chart should be there with right information.”* This has resulted in self-doubt about their performance, inability to enhance their role as a healthcare professional, and lack of trust to practise their professional role to help their patients, especially patients in a critical condition as H1P15 expressed: *“I do not think the system has the ability to enhance my role as a healthcare professional.”*

This view was reinforced by H1P6 when he highlighted in his view what is lacking and how it makes him feel:

*“Because [...] Lack of documentation. Some of the history or information such as emergency visits, not uploaded or scanned in the EMR, and some information is simply not there.”*

H1P7 similarly confirmed the arguments above by providing more examples of the information that is lacking and how it resulted in not depending on the EHR system but instead looking for the patient information in another way outside the EHR system. H1P7 said:

*“Prior clinic visits, inpatient hospital stays details, sometimes OR reports, sometimes our systems scan documents, and sometimes the scan is very poor that I need to call and ask them to send it to my email.”*

Physicians here supported the previous statement of the limited access or availability of patients' information. Hence, H1P15 stated that since the EHR system limited to my role as a healthcare professional, then he does not think that it can help him do his job and eventually will adversely influence his performance as a healthcare professional.

Nurses have also supported this, but from their own perspective. Nurses reported dissatisfaction with the ***unavailability of hard copies of patients' information***, which causes limited resources or the ability to have good information about their patients to carry out their work. Hence, this makes nurses feel that the EHR system impacts their role as healthcare professional. For example, H2N2 stated:

*“The drawback is what I want to talk about. Why? Because you know if there is a failure in the system, suppose you know this is, I am going some care in the medication, we find it difficult to deliver the patient care. Because everything is built up in the system, we do not have a hard copy of the medication that let us say about the medication, about the condition. Suppose the patient newly admitted; we do not know about the previous*

*condition, suppose the patient is a cardiac patient, and the patient is having hydrated or whatever it is.”*

The nurse here feels the system is not supporting her professionally, that she is rethinking the usability and benefits of the EHR system, and demanding paper copies of patients' information, which has not been reported from physicians. Besides, when there is an emergency, it will not help them to give the best care to their patient because of the lack of data, a lack of access, and patients' data are unreliable or the data are generalised, which means it is not relevant to the patients' situation. Hence, whenever there is an emergency, they need the data as soon as possible, and it should be on the system, but when they turn to the system, they do not find the information they need at that critical time, or they do not have the authority to look at that information.

Another sub-theme is ***clinical care was affected***; however, only physicians raised this concern, as nurses have not reported any concerns about their medical skills being negatively affected. Physicians informed us that their skills as physicians are declining, negatively influencing them at work and causing them to resist the system. Physicians expressed that they feel they are *no longer practising medicine* and only sitting in front of the screen all day. For instance, H2P7 stated:

*“Before, a good physician is known in his treating patient physical examination. And process thinking can be seen. Now, no, from what he is doing on a computer, maybe you are copying the information this is it not good. Now, as a physician, you have to be excellent in computer, you have to write faster, to finish your job rather than to be only a physician. No, a physician you should read every time and express your knowledge.”*

This view has been reinforced by H2P6, who said: *“Personally, I feel like we are practising medicine more in front of the screen.”*

Further, another sub-theme emerged that could be linked to how physicians' clinical skills are being affected by the EHR system, which is that the EHR system is ***giving a false indication about patients' conditions***. This issue might lead to severe consequences for patients and eventually lead to medical errors, as indicated by some physicians. For

example, one of the participants expressed how the system is showing the wrong indication about the patient's health situation, and the problem is that EHR is the only source of information about their patient. Hence, physicians depend only on the EHR system to see how their patient is doing, which is wrong. H2P7 said:

*“Sometimes if you didn't go inside the room and see the patient exactly what he is doing, what he is having it might sometimes give you a wrong judgment. Because if you have a heart rate of 60, and the system saying it is normal and you are not beside the patient. But when you go inside, he is sweating and he has difficulties with breathing, that will change the picture [...] But what is lacking, the physician judgment for the patient condition, when you are assessing the patient as a holistic case, you cannot do it in the system, unless you have been physically there.”*

Here the participant has expressed that the *system is misleading them or giving them misinformation about the patients' condition*, which may lead them to have medical errors and not be able to save the patient's life. This might be related to the lack of detailed information about the patients' condition due to EHR resistance from other healthcare professionals. This view has been supported by H1P6 when he said: *“It [the EHR system] causes a lot of mistakes.”*

**Medical judgment affected** is one of the sub-themes that both physicians and nurses have raised. This refers to how the management plan for their patients has been negatively affected because of the EHR system, which is caused by, for example, *lack of information or lack of access to patients' information*, as discussed in the previous sub-themes. Hence, participants have raised the issue of incomplete documentation, affected their medical judgment and leading to medical errors.

Medical judgment can be affected due to many reasons highlighted by participants, such as *lack of critical information; lack of information due to healthcare professionals not documenting it; late recording of the information; and difficulty finding or gaining access to it*. For example, the H1P1 participant said about the lack of critical information: *“Some time there's named missing or missing information.”* This view has been supported and



shared by other participants, such as H1P2, and when asked they specified types of information that are missing:

*“The follow-up note, specific patient, complains if he complained for any reason to the pharmacies for example that does not get to my end, so I do not see what the other’s problems are.”*

H1P2 has also complained not only about the patients’ medical information but also about how the patient’s right to make complaints are not available or maybe what the patient needs from the physicians is also missing (e.g., Morafiq letter as we will see later). This is considered vital information for patients’ healing process and the quality of patient care. Furthermore, H2P3 also supported this claim by mentioning other types of missing information. However, he adds and explains that a lack of critical information is because other healthcare professionals are not committed to recording records on the system, which adversely affects their patient and their medical management plan. H2P3 stated:

*“[...] you would not know what drugs he has been using in the last six months. That is one of the things that are missing [...] Other things such as being late in the transcription [...] And that is one of the things that I think it is a problem.”*

H1P14 expressed and explained his feelings and views about how the system impacted his work and role as a healthcare professional. He expressed his frustration and how he experienced these problems of having no information or no access to the information while having a sick patient:

*“It gets really frustrating when you have a really sick patient you are dealing with, and trying to obtain certain information because the information is vital, is very important for me to get the information in a timely matter, a few minutes they count. [...] imaging dealing with a patient who is hanging between life and death, and I cannot see the CT, and my entire management is going to depend on whether he has a brain bleed or not? I need to know this, and I need to know it now!! So, it is frustrating, so, I get the burnout from the emotional stress, dealing with really sick patient, really sick human being*

*trying to save his life, and from the IT part or the system part, where I cannot help him, I am helpless, because the system failure.”*

The data shows that physicians are dissatisfied with how the system affects their daily work routine and patient care. All 42 participants have complained about these issues, showing how important it is to healthcare professionals. Nurses have also raised medical judgment issues from their own perspectives. Nurses expressed their dissatisfaction about how the system is not helping them. For example, to know the previous condition of their ill patient, what the patient should be given, or even what kind of medicine he should be or had been given. This information is not available and will affect their work and patient care. H2N2 explained this situation when said:

*“It is the patient’s medication itself, so maybe if it is an anti-seizure medication, maybe it is a medication that has to be given. Suppose he does not know the dose we give a wrong dose to the patient, supposed the doctor who is on-call does not know the exact dose what the patient is getting.”*

Consequently, this could result in wrong judgment about their patients’ treatment plans and could lead to medical errors, which several nurses have expressed. Also, they are facing a lack of information due to the medical assessment of the patient not being accurate or incomplete. This is because when nurses or physicians do the medical assessment for the patient, they do not do it accurately because they do not want to, or because the system itself does not help provide information, resulting in healthcare professionals writing general assessments. For instance, H2N3 said:

*“When it comes to assessment, it is definitely something I don’t agree with, it is not an accurate assessment, or reliable assessment [...] Now the patient needs oxygen; at this point the patient needs an intervention, but I would not know that, because the system doesn’t give me that chance, the system telling me my patient is okay.”*

H1N3 has supported this statement and included that the information is not reliable and there will definitely be a mistake because now we are being asked to rely heavily on a computer:

*“But reliable no. Eventually, it is a computer; there will definitely be some mistakes like even the age of the patient which is an important information is wrong.”*

### **5.1.2 Healthcare Professionals’ Belief in their Job**

The second theme is the **professionals’ belief in their job**, which has arisen from wrong judgments being made that caused medical errors. Healthcare professionals’ belief in their job refers in this study to what healthcare professionals think they should achieve in their role as a physician or a nurse. To clarify, healthcare professionals have several duties to help their patients; one of them is to protect their information privacy; if they believe using the EHR system would prevent them from protecting their patient’s privacy, it might negatively affect them as healthcare professionals.

Therefore, many sub-themes were identified; physicians expressed how their ***belief of how to be a healthcare professional was affected*** because of the EHR system, while nurses were concerned about the effect of the EHR system on their ***commitment to being a ‘real’ nurse***. In addition, both physicians and nurses reported concerns about their ***patients’ privacy being violated*** and ***patient satisfaction being affected***, which might have a considerable impact on their job or what they believe their job should be.

Physicians have reported that they believe the system damaged their ***belief in how to be a healthcare professional***. Physicians saw the EHR system as a potential threat to their daily work, goals and, more importantly, their patients. Hence, many interviewees highlight how the system is making them less effective in their work, in what they are supposed to do, or what they believe they should be doing as healthcare professionals. For example, consider what H1P2 said: *“Computer problems need to be solved, it affects my work, my daily goals, my patient which they are supposed our priority.”*

Another sub-theme extracted from the nurses’ interviews that they believe has influenced their work is their ***commitment to being a real nurse*** to their patients. Nurses have only reported this, and no physicians have expressed such a thing, which shows us the difference in nurses’ and physicians’ mentality, their values, what do they think their part is as a healthcare professional, and their reaction to the EHR system.

To illustrate, a nurse has expressed how being a nurse does not only mean providing medical care, but they also have another vital element as a professional nurse: having a deep connection or relationship with their patient via therapy and psychological care. According to what the nurse has said, they cannot perform their full duty to be a 'real' nurse because the EHR system is taking them away from their patients and from their core practical job as a nurse, which is not only documenting but is giving their time to their patients and showing how they care about the situation. For instance, H2N3 stated that:

*"For me personally, nurse is providing that therapy care as well as the medical care, it is not just about the medical care. What about the psychological care, and do you have time for that? I don't think we do, because we have much time invested in our documentation in the system."*

Thus, unlike physicians, according to what the nurses' participants said, they believe that psychological care, such as empathy and compassion, are considered a vital part of the medical care process for the patient.

Another sub-theme that physicians and nurses have reported is that their **patients' privacy has been violated** because of the EHR system. Privacy from healthcare professionals' perspectives defined as respecting patient's wishes, space, and belongings (Barron, 1990). For example, H1N3 said: *"Everyone can see it. We have access to pretty much everything, even our colleagues; it is so easy to get access"*. Physicians have also raised this concern. For instance, H2P5 stated: *"For me, I do not agree, and here, anyone can have access to your file."* H2P10 has supported this:

*"That will affect the confidentiality of the patient information, anybody can open the file and see, here you can do it. That's one of the system limitations. If I want to search for your brother's information, I can log in, put his name, and look about it, this is affecting the confidentiality."*

Patients' information is important and should be kept confidential for the participants; hence, according to the data, the physicians think that protecting patients' information is one of the values a professional should adhere to. Some physicians regarded this concern

as a cultural concern for healthcare professionals. H2P8 confirmed when asked why physicians have raised this issue and whether it could be related to the cultural issue: *“It is about culture.”*

Physicians and nurses have also expressed how their ***patient satisfaction is affected*** because of the EHR system. Concerns about patients’ satisfaction were reported by the interviewees and generated from the data. Patient satisfaction has been defined by many authors; however, they all agree that patients’ satisfaction refers to the patients’ attitude or perception about all or some aspects of patient care (Al-Abri & Al-Balushi, 2014). For instance, when asked how the system affected their interaction with their patient, H1P7 said: *“Patient will think that you are not interested. It will decrease patient satisfaction”*. This statement has been endorsed by H2P6, when he said: *“Patient don’t like us when we spend time on the computers instead of looking at them.”*

Nurses have also highlighted their concerns about their patient's satisfaction and how they see the EHR system negatively impacting their professional values as a nurse. For example, H2N1 said: *“Sometimes your patient will be frustrated that you are doing some in the system related to the other patient.”* Nurse H1N1 said: *“It is difficult with the patients to communicate with the physician. So, I think the system put a strain in the relationship, it has a negative impact.”*

### **5.1.3 User Interface Design**

The second theme that has been created from the data the **User interface design**. This theme is considered a problem that has been addressed by many of our physicians’ and nurses’ interviews: it causes them to resist the EHR system as it affects their work as healthcare professionals. However, physicians raised more specific issues than nurses regarding the system, such as ***lack of standardisation*** and the ***system not being designed for healthcare professionals***, while both healthcare professional were not happy about the ***system being complicated***.

For example, physicians expressed frustration with the ***lack of standardisation*** in patients’ name writing. This makes it hard for them to search for their patients’ names as Arabic names are written differently. To illustrate, the name Abdulrahman could be

written in the English language as Abdulrhman, or Abdulrahmn. Hence, the lack of standardisation of the patients' names in the system makes it difficult to find or retrieve the correct patients' names and information. H1P7 said:

*"Name Ahmed will be spelt in many different ways. And when you going to search the patient, it is going to be very difficult because people who enter the name enters in different ways and Ahmed in Arabic has a specific way to spell it, has specific spelling translated to English you can change the vowels as you like. So, this is why it's difficult."*

H2P1 supported this argument, and he made further explanations and highlighted some reasons to why this is happening:

*"There are some lacks in the system because whenever we are managing the patient, we go back to the history, and there are many physicians who have the same patients, and not all of them are using the system in the same way. [...] make it difficult for us to understand what is happening with the patient."*

Another sub-theme highlighted by physician participants is that ***the system is not designed for healthcare professionals***. The participant expressed how they believe the EHR system was not designed to meet their needs as healthcare professionals, but rather for the need of the administration to have more control over physicians' work. For instance, H1P6 stated: *"It is not designed for the need of the healthcare practitioners; it is designed for the need of the institutions."*

Hence, many physicians requested during the interviews that their voices should be heard during the system design, especially in their area of expertise. For instance, H2P3 advised that:

*"I think they should take the opinion of the end-users of healthcare providers when they build the system, especially in certain areas. They did not take the opinion of the end-users when they started and is important."*

Furthermore, physicians and nurses have reported a similar concern, which is another sub-theme: how ***the EHR system is complicated*** and ***scattered***. For example, H1P2 stated: *“Multiple information that is in multiple domains. We do not have one system that captures all the data just scattered.”* Multiple participants echoed this view. For instance, H1P7 supported this claim and explained what difficulties he faces in doing his work because of this problem:

*“Our system is very difficult to navigate; the Health Record system is very difficult. [...] Because it requires to look, there are pre-sets requires to re-enter the data all over again to get them. The data are hidden. You need to know a lot of tricks in order to pull data out. [...] it is user-friendly.”*

H1P8 reinforced this argument and included that this problem makes him less efficient by 50% in his work as a healthcare professional; he said: *“System requires multiple steps to do one action [...] you can cut 50% from your time with less task.”* Further, H1P9 also raised this issue and how the healthcare professional’s time and efficiency are important; he stated: *“The system is difficult to be used, as a physician the time is the most important thing.”* Another physician supported these statements and included that most of the files in the system are scanned documents, complicating his job locating the information. H1P5 said:

*“The problem here is, they scan the documents, so if you want information, I have to read all the scanned paper to locate that information.”*

Nurses have also expressed such concerns; for instance, H1N1 stated: *“If you want to go from A to B, it is easy [...], but in the system, it is ABCDEFG, it is like that until Z”,* which was also confirmed by H1N4 who stated:

*“It is not organised in a way that can easy grasp the information that you want. Therefore, you need to dig deep; I do not have time to dig deep into information in the EHR.”*

Physicians and nurses here expressed their dissatisfaction with the user interface of the EHR system and how the EHR system interface is not user-friendly, does not help with

their daily routine, and makes their job challenging, which is the opposite of what the system promised.

#### **5.1.4 The system is re-structuring professionals' traditional role**

The fourth theme which has been generated is how the **EHR system is re-structuring healthcare professionals' traditional roles**, and it refers to how the system is changing healthcare professionals' roles either positively or negatively. Sub-themes identified under this theme include that the system is **decreasing physicians' authority**, and **physicians' authority is stolen** from physicians' perspective. In contrast, nurses were happy about this change as they reported that the **EHR system had promoted their profession as a nurse**.

To illustrate, from what both participants are saying, we have noticed that there are changes the EHR system has introduced; however, some are happy, and others are not. For example, one of the sub-themes highlighted is that nurses told us how the **EHR system had promoted their profession as a nurse**, especially in front of their physicians' colleagues. Authority, for example, in terms of refusing to fill physicians' patient records instead of them, with an excuse of patient privacy. For instance, H1N1 said: *"The system gives you authority, and it also makes you to do things that others cannot."*

Another nurse expressed the same statement and added how this authority makes him/her feel the power over the physicians, which is considered and interpreted as a change in how they perceive themselves in front of physicians. H1N3 said: *"As a nurse, when I use the system, at least I can say that I have power or benefits to say no to the doctors."*

One participant expressed happiness about how the EHR system gave them independence from physicians' requests. For example, she expressed her satisfaction about physicians having to request things, which as obeying nurses to physicians' requests, which they do not have to do now because of the EHR limitation in nurses' accounts. This is because they cannot make such requests in their own EHR system as a nurse; hence, the physician must request things such as lap ordering or medication with their own EHR account.



Therefore, this has been seen as ***the EHR system is decreasing physicians' authority***. This change is because since nurses now do not have the authority to make requests, physicians must do it through the system. For example, H2N3 stated: *"I really like the idea that doctor ordering laps, and doctors putting those orders for you."* Nevertheless, according to the interviewees, the nurses are happy about the system despite its limitations, flaws and how it affects their work, as discussed earlier.

Furthermore, as a result of our earlier discussion, physicians feel that their ***authority has been stolen***, as *they are unhappy about how the receptionists have taken some of their authority because of the EHR system*, such as opening a visit for their patient without receptionist approval. For example, H1P8 said: *"You cannot have access to patient data directly, or you cannot request investigation [...] the receptionist will open up visits."* H1P3 has supported this statement, and he further expressed how he now feels as a healthcare professional that to do his job, he now needs the administrators, and the EHR system causes this. Consider what H1P3 said:

*"I have to wait for the administrator registration unless you know some of them and call them personally; I need administrators now to do my job!"*

Here, H1P3 expressed his frustration as a healthcare professional and how the administration's authority and approval are needed to do his job. This argument is reinforced by H1P7 when he explained that even for basic changes such as changes in consultation time, the clerk (administration) has to approve it. H1P7 said:

*"I need to go through the clerk will go to a supervisor who will approve it. So, I'm just changing the clinic timing from Saturday to Monday, and I cannot do that as a doctor."*

Another physician, H1P16, also supported all these statements, and he also added another problem from his own valuable experience when he said:

*"But for me, I need to open a file for the patient, I need to call two, three people to open an encounter, for example, let us say if you want to request a*

*test for a patient that has not been admitted, in his house, you need to call someone to open an encounter for you, the encounter is a file that you can request things from.”*

Physicians, especially in Saudi Arabia, have long been acknowledged as the hospital's decision-makers. Hence, having this feeling of being unable to even open a visit for his patient to see his physicians is considered a downgrade of their authority and role, which H1P8 explained and said:

*“I think that should be under our authority. The physician should have easy access or direct access to open a file or open a visit to the patient on his behalf.”*

H1P11 and H1P12 have also supported his claim about how the system affected them and confirmed that this negatively impacts their self-perspective as healthcare professionals. They both complained and said:

*“It is severely impacted in a negative way [...] So, I am just giving you the pic of how it works, and no, from what I said, it did not have a positive impact on my performance” (H1P11).*

*“Does it make us work to the best of our ability? No, it does not. does it make my job more flexible as I need? Of course, not” (H1P12).*

Hence, this feeling will result in physicians' resistance to and avoiding from working with the EHR system. Furthermore, physicians have also expressed how they feel that the *EHR system included a secretary's job as one of their roles*, and they feel angry about that, as they believe their time should only be spent on practising medicine, not anything else. For example, H1P6:

*“Yes, I think digitalization increased the burden on the physicians in terms of documentation and care, causing physicians to do more and more work, that is unnecessary done by the physician.”*

Furthermore, H1P11 highly supported the above argument, and he explicitly demonstrated that they are now doing a secretary's job, which is not what they have been trained to do as a healthcare professional. H1P11 said:

*"That is another thing: to waste a physician's time. [...] I will have to tell you the truth in this regard, sometimes we do secretary job, I have to book certain things, certain procedures, I have to request for example a procedure for my patient, sometimes I enter the request, I will have to go the radiology department what is the appropriate date to have the procedure that fits them!!! Not me?? When are they available to do it, and that is a real setback."*

They have also expressed how most of the work now has been shifted from nurses and administration staff to the physicians; H1P6 said: *"Most of the burden is being shifted from the nursing and support staff to the physicians; this is one of the main problems about the EHR in our institution."* H1P12 supported this statement and said: *"The role has shifted."* H1P14 highlighted how they are stressed already from their role as a healthcare professional, and they do not need additional problems or stress added to them because of the EHR system:

*"Because the burden of seeing patients and managing patients and stressing about the medical part of it is enough, I do not need another burden to be added from or by the EHR!"*

In addition, nurses highlighted how the **system legally saves them**, for example, from non-cooperative physicians. One of the participants expressed how she is happy that the system is there so she can record every step and communication with the physicians, and if they do not respond, nurses are legally safe from any implication that could happen to the patient. Hence, this could protect nurses' reputation as a professional from being damaged by a reckless physician. For instance, H2N1 stated when asked about EHR:

*"Positive impact, saving the staff itself, in terms of that you already spoke to the doctor regarding something about your patient, my patient is complaining about something, and the doctor did not do anything, you already reported him, so, the system will save you, because you will not spend*

*24hrs with your patient, so, you will document, this is the issue, I already informed that is it. If you did not do anything, that is it."*

Another nurse has supported this statement, as she said that nurses have something called "nursing clinical notes" (NCN), which are exclusively for nurses to document everything in their EHR. As she explained, if the nurses made any mistakes, for example, she could inform the physician via this NCN, and he should pick it up; if the physician failed to do that, the nurse would not be responsible for it because she documented it. Consider what she said (H2N2):

*"There is something called nursing clinical notes; we document everything in there. So, if you have any wrong orders or clarify something supposed a critical result, everything has to be recorded. So, nobody can come and tell you that you didn't inform me of the conditions, everything will be there. [...] You said the patient is sick, and you informed the on-call doctor he is sleeping, so he just hears and sleeps, no, you should document. In the next day, there will be an investigation on that they will be, we have a quality board, which will investigate this thing, if the nurse document it is okay, they will go back to you. So, it is good; everything is there and will protect you."*

Here, the participant highlighted how the system is saving her from the negative implications of a non-cooperative physician, and also, while she was saying that you can feel that she was happy about this feature in the system. This might be because they feel the system gave nurses the power now to report and document any mistake that happens from the physician and the ability to report them to the administration. This gave nurses a power they did not have before, which is a documented request or order to a specific physician through his EHR account, and if he did not pick up that order or request, he would face the consequences, not the nurse.

Hence, when nurses feel that the system is giving them more authority or promoting their professional identity, they will be happy about the system. Unlike the data from physicians, where all of them have expressed how they feel the system is diminishing their professional identity in terms of their role, autonomy and reputation as a physician. As discussed earlier, physicians now feel the system has diminished their image as a

professional, or the people at the top of the hospital hierarchy, so even nurses can now disagree with them.

### 5.1.5 The System Categorisation of the Healthcare Professionals

How the **system categorises healthcare professionals** is the fifth reported theme for this question, which refers to how the system makes particular healthcare professionals feel less important than others. For example, in this study, how; particularly the nurses felt the EHR system had reduced their importance in terms of ***less access to patients' information***, the ***system making nurses more dependent on physicians***, ***nurses being treated differently to physicians***, and ***nurses being asked to check their system every hour, unlike physicians***.

We will begin with a sub-theme that almost all nurses from both hospitals have reported, which is that ***nurses expressed less access to patients' information than physicians***. For example, H1N1 stated:

*"The system here is quite a closed system. Before, we could even have access to those things that we really need an access to. We should request it first."*

Unlike physicians, nurses have limited access to their patients' information due to how the system is designed according to them to limit their authority and role as professional nurses. H1N4 has also supported this statement and elaborated by saying that everyone at the hospital should have access to patients' information; not only physicians ***"information should not be limited to a certain team member or healthcare provider, it should be available to everyone."*** A handful of physicians have also expressed their limited ability from the system to access their patients' information. However, we have noticed that this problem accrues more from nurses as most of them have highlighted this problem. A lack of access to the system and their patients' information strongly impacts their role as healthcare professionals.

Another sub-theme that has been noticed is how the ***system is making nurses feel more dependent on physicians*** to do their work because of the system. Before the EHR system, nurses can, for example, order medication without any complication; just write it down

on a piece of paper, and the medication request can be issued. However, now because of the EHR system, they have a limitation in what their EHR system account can do, which in their perspective has limited their role as a nurse because now they need approval for steps that they had and feel that they should continue having.

To illustrate, one of the nurse participants informed us of a problem that has been encountered, which is the inability to help their sick patients by issuing sick leave without a physician's approval. Sick leave is a letter patient needs to give to their employer, or, if a student, to their school or University, if they are going to be absent for more than a day due to their health condition. Before the restrictions that EHR system introduced, and how everything now should be on the EHR system, nurses were able to issue such letters.

However, with the EHR system in place, nurse participants have expressed how it is now challenging to help a patient with such a letter. The nurse expressed that sometimes the patient needs to wait until tomorrow because the consultant leaves at 04:30 pm until they give their patient the sick leave letter because the consultant must approve it. They see it as an influence on their role as a nurse, and they should be given the ability to approve sick leave for patients. For example, H1N3 said:

*“Entering the sick leave for the patient, most patients asking for sick leave, but we cannot do it, because it must be approved by the consultant [...] we will have to call the doctor to do that, and then to be approved by the doctor itself. [...] So, if a patient told us they need a sick leave after 4:30 pm, because after 4:30 pm the consultant finished already their workday, we will tell our patient we cannot give them sick leave because physicians already gone.”*

Another sub-theme is that one of the nurse participants has raised the concern that they are ***treated differently to physicians because of the system***. For instance, they mentioned they are being audited based on their usage of the system, unlike physicians who did not say or raise any concerns about how they will be treated if they have not documented or used the EHR system. H2N3 said: *“We are audited based on our documentation; we are under pressure with our documentation.”* This might lead them to resist the EHR system to show their dissatisfaction with the process.

Also, nurses are being asked to **check their system every hour or two**, unlike physicians who have not mentioned that either as a concern or as something requested from the administration. For example, H2N3 said: *“They do tell you actually every two hours you need to refresh your page, every two hours if not one hour.”* This statement has been supported by H2N4 when asked whether this is the case: *“Yes, it is correct that is what happening.”*

## **5.2 How can professional identity explain resistance to EHR for healthcare professionals in Saudi Arabia?**

It has been argued that identity is a primary motivator of behaviours (Carter & Grover, 2015), especially for professionals as a powerful occupational group that works to protect their high level of autonomy and values (Abbott, 2014). Thus, a person's professional identity is central to how that person will interpret and act in the context of a professional situation (Chreim *et al.*, 2007). Hence, in the case of healthcare professionals, such as nurses and physicians, a change or a threat to their role could affect their professional identity, potentially leading to resistance with dangerous implications, as professional role identity is highly resistant to change (Chreim *et al.*, 2007). In addition, when professionals experience an identity threat, they are motivated to resolve the threat (Jussupow *et al.*, 2019).

This RQ2, *How can professional identity explain resistance to EHR for healthcare professionals in Saudi Arabia*, has been driven by the gap in understanding healthcare professionals' views, such as those of nurses and physicians, on the changing processes in the hospital and how those changes affect their professional autonomy (Heath & Porter, 2019). It is also important to identify the aspect of "emergency" involved in the healthcare practices and how it can contribute to resistance (Nach, 2015). However, four themes (Table 5.2) have emerged, and many sub-themes have been identified under those four themes, which has been highlighted to help us understand how professional identity can explain healthcare professionals' resistance in Saudi Arabia.

Major Themes	Sub-Themes
Resistance due to cultural conflict with the EHR system requirement	(P)
	<ul style="list-style-type: none"> <li>• Resistance due to lack of sensitive patients' data</li> <li>• Using a colleague's personal EHR account</li> <li>• Making low-ranking physicians enter patient information on their behalf</li> <li>• More resistance to the system than nurses</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• Close connection</li> <li>• Less likely than physicians to resist the system</li> </ul>
	<p>(P) &amp; (N)</p> <ul style="list-style-type: none"> <li>• Not recording patient-sensitive information</li> <li>• Will not record patients' information if they request not to</li> <li>• Not recording information that is considered to be Taboo in Saudi Arabia</li> <li>• Using their relationship to resist the system</li> <li>• Resistance due to the complexity of the ERH system</li> <li>• Lack of continuance training</li> </ul>
Resistance due to healthcare professional role being threatened	(P)
	<ul style="list-style-type: none"> <li>• Resistance because healthcare professional performance</li> <li>• Quality of patient care delivery</li> <li>• Purposefully abusing the system</li> <li>• High reliance on the EHR system</li> <li>• Less patient physical examination</li> <li>• Professional critical skills decreasing</li> <li>• Lack of time with the patient</li> <li>• Surveillance tool</li> <li>• Need to justify medical treatment plan to the system</li> <li>• Quality check control</li> <li>• Physicians are being assessed based on their system usage, not medical skills</li> </ul>
	<p>(N)</p> <ul style="list-style-type: none"> <li>• Failing to provide accurate information</li> <li>• Purposefully abusing the EHR system by recording wrong information</li> <li>• Failure to provide psychological care to their patient</li> <li>• Wasting time documenting useless patient information</li> </ul>



	<ul style="list-style-type: none"> <li>• System controlling them</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• Lack of trust in the system</li> </ul>
Resistance due to healthcare professional autonomy being threatened	(P)
	<ul style="list-style-type: none"> <li>• Having a visitor account</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• The system is limiting nurses' autonomy</li> <li>• <i>Morafiq</i> system</li> <li>• System causing nurses to quit their work</li> <li>• System causing nurses to change and modify their professional priorities</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• Limited authority</li> </ul>
Resistance because EHR system damaging relationships with healthcare professional colleagues	(P)
	<ul style="list-style-type: none"> <li>• Privacy concerns for their personal information</li> <li>• Getting in between colleagues' personal problems</li> <li>• Physicians abusing power to avoid medical errors</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• Physicians abusing the system</li> <li>• The system is damaging nurses' relationships with physicians</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• Tensions between colleagues</li> <li>• Fear of the EHR impact on their self-perception</li> </ul>

*Table 5. 2 RQ2 Emerged themes and sub-themes*

### 5.2.1 Resistance due to Cultural Conflict with the EHR System Requirement

The first theme generated and related to physicians and nurses is **resistance due to cultural conflict with the EHR system requirements**. From what the interviewees tell us, we can see that the conflict here is at the personal level and can be referred to in this research as an intra-personal struggle between work demands (the EHR system) and personal demands and personal values (e.g., culture). The role of culture and how it affects their decisions during work has been identified and expressed by many interviewees.

To illustrate, physicians and nurses informed us about their willingness to ***not record patient-sensitive information*** on the EHR system because of privacy concerns, which is related to the patients' culture and being respectful to a particular culture. For instance, the participants argued that they would not record some of the patients' sensitive information because anyone could access it. For example, H1P6 advised that they *"stopped documenting very accurate information in the EHR because it is available for everybody to see."* H2N3 supported this view, and when asked why they feel this information is sensitive, he explained that by saying: *"It goes back to the ethical and cultural issue, I guess why the individual would not be in the system."* Other physicians have supported the above two statements, but some have expressed another form of resistance which is not recording it, but if other physicians need the information, they will variably have passed it to them. Consider what H1P3 said:

*"If the information is sensitive, I variable pass it to the other physician instead of writing it because anyone can access the patient's file; this is not right for me."*

Physicians have further explained their decision because they also feel that the EHR system has allowed anyone working at the hospital access to patient information, including non-healthcare professionals, and this means administrators also. They expressed their concern about how this could endanger patients' confidential information. To illustrate, H2P10 stated this problem and called it one of the EHR system's limitations: *"Anybody can open the file and see; here you can do it. That is one of the system limitations actually."*

This was supported by H1P1 when asked why he would not use the EHR system to record his patient information. He addressed this issue as a dangerous issue for their patients' information. H1P1 said:

*"Because I have noticed that electronic access is available to anyone in the hospital, whether physician or not physician, he has the access from anywhere, and can expose all the information that is related to the patient, even if he is not related!! And this is dangerous."*

Another physician further added that they would also not record to comply with patients' wishes, and as a healthcare professional. H2N2 illustrated:

*"If patient refused, I will not record it, but here at the hospital, actually, if the patient refused, we don't record it. [...] Actually, we do it as a healthcare professional, I am not sure about the policy of the system, but if my patient refused, I will not record it against his will."*

The data reflects that both types of healthcare professionals in our study understand their patients' needs and culture; as when asked why they comply with their patient's wishes, they mentioned many reasons, such as *cultural, professional and ethical reasons, and easy access to the patients' information by others*, as previously mentioned by H1N3 above. Hence, if they have any problems with these needs, they will resist the system if they believe it is not protecting their patients' information.

Furthermore, this shows a **trust issue with the EHR system** among healthcare professionals, as they do not believe that it makes patient information more secure. H2N4 confirmed this by stating that she believes patient data in the EHR system is not more secure than the paper-based approach: when asked whether she believes the patients' information is more secure than paper-based: *"No, I do not think so"* (H2N4).

In addition, both healthcare professionals have also advised that they ***will not record patients' information if they request them not to***. Here, the healthcare professionals expressed that they will not also record any information, whether it is sensitive or not, if the patient does not want it to be recorded in their file and refuses for it to be recorded. Healthcare professionals acknowledge that they respect patients' wishes and privacy concerns, which could also be linked to the culture. For instance, H1P6 said when asked whether he would respect the patient's wishes not to record any information he does not want to be recorded in the EHR system:

*"I would definitely do that. Because whenever anything posted in the system, it will stay there forever, and it is very easy to access these information."*

Furthermore, ***not recording information that is considered to be taboo in Saudi Arabia*** is another sub-theme that has been identified from the interviews. What we mean by taboo information are those that are considered socially and religiously forbidden in a country like Saudi Arabia. Examples of this type of information include consuming alcohol, drugs, and some diseases such as HIV, which in Saudi Arabian culture is an indicator that this person has had a sexual relationship outside of marriage, which is forbidden in Islam.

Further, mental health problems are considered taboo or socially embarrassing in Saudi Arabia, as the Saudi culture values secrecy and a preference for confidentiality. For instance, H1P7 said: *“For alcohol which we do as physicians do not write alcohol at the EHR.”* This has been supported by H1P6 and included other sensitive information: *“Sensitive information, like drug use or drug abuse, or alcohol use, things like that, that are socially taboo in Saudi Arabia, so I do not document them in the EHR.”* Other physicians have reinforced this argument and advised that even HIV will not be recorded. H2P1 said: *“For example, maybe the patient HIV if he decides to not tell anyone we can [...] just keep it in the back of our minds and that is it.”*

These statements about protecting patients’ information have been supported by H2P1 when asked whether protection of patients’ information is part of their identity as a physician:

*“Because being a physician is actually being good in keeping up with physician-patient relationship. If you do not know how to do this mutual relationship, you have a defect in your training. So, you have to re-build that defect and proceed again as to be a physician.”*

The participants here have also suggested that if you do not follow what your patient wants, you are not a good physician and should be re-trained. Additionally, some nurses have also expressed that they will not record information that could harm the patient from a religious point of view. For instance, some of the nurses agreed that they would not record whether the patient is an alcoholic or is drinking alcohol, has HIV symptoms, or if there is a child abuse case because they prefer privacy and whether the patient is mentally ill, which could be related to the Saudi culture. For instance, H2N4 states:

*“Sometimes they don’t mention it. For example, child abuse, it supposed only the nurses and doctor who are taking care of the patient who knows about this kind of information, it should not be everybody know about it. But this is one of the things I sometimes not do in the system, there is missing information; we do not write everything. For example, sometimes for me, there is information that I prefer to convey to someone verbally, rather than put it on the system because I am not sure who is going to open the system later on.”*

In addition, H2N3 told us about her experience with a non-married pregnant lady, which is in Islam considered to be Haram (حرام) or forbidden, and if it is recorded, there might be a social or legal problem for the lady. Hence, she did not record this information in the system. She stated that:

*“For me, if a woman came here to me and she is pregnant outside the marriage, I will understand it, and I will respect her decision to not document it. Because her problem is socially.”*

However, we have noticed from the data that because of this resistance behaviour, physicians’ participants will face another problem: **resistance due to the lack of sensitive patients’ data**. Hence, not recording sensitive information affects the quality and quantity of information about the patient and might affect patients’ treatment plans. For example, H1P1: *“Sometimes there’s missing information.”* Furthermore, H1P2 explained more about what information is missing, and they are resisting EHR and not depending on it because of this problem. H1P2 said: *“Emergency notes are lacking; we have to look for it in a different way.”* The reason behind the lack of this information is cultural; as we explained earlier, how culturally sensitive information is not recorded.

H1P10 confirmed that when he said: *“I know some people are afraid about this, so they do not write all information about the patient, or they write general information.”* H1P6 has endorsed these statements as he said:

*“It is not there. Lack of documentation. Some of the history or information such as emergency visits, not uploaded or not scanned in the EHR, and some information is simply not there.”*

However, while analysing the interview data, we have noticed a difference between physicians and nurses, that **nurses are less likely than physicians to resist the system**. Unlike **physicians, who are more resistant to the system**, and if possible, they would like it to disappear as H1P5 said: *“For me, to get back to the files and papers are better, at least it is available and has a copy.”* Here, H1P5 preferred going back to the paper files, while another physician participant highlighted that he would do anything to avoid using the system: *“I use the system, as less as possible, anything I can do without the system I will do it without the system”* (H1P6).

H1P6 confirmed that he is now not using the system after he lost his username and asked the information technology department at the hospital not to fix his account, as he prefers to work without it:

*“They asked me to use it, and [...] I refused to use it but then after insistent, I tried to use it, but my username is broken thankfully, so, when they asked for the IT support to come and fix it for me, I simply asked them not to fix it because I prefer it to be broken, and not having to use it.”*

However, we will first discuss how and why nurses resist the system less than physicians. For instance, H1N1 said: *“The doctors want to take the risk to pass the system for urgent care of the patient, but the nurse refuses to do so, so the nurse like is legally safe.”* Here, the nurses have expressed how physicians are more decisive in their decision to resist the system, while nurses prefer to be on the safe side of the process. Furthermore, we have also noticed that some nurses will, despite how **culturally sensitive information is, they will still document it on the system**, even though they know how inappropriate that is to their patients. For example, H1N2 responded when asked whether they would record patient information if he refused: *“But I am complying to the policy, and also, to save the patient information”* (H1N2), and H1N3 confirmed this opinion.

H2N3 supported their position; however, she has mentioned that she will record the information upon her own judgment as a professional nurse, and if she believes that the information is essential, she will record it. H2N3 said: *“If I think it is important to provide good care for the patient, I will document; if not, I will not.”*

For example, a nurse’s response when asked about those physicians who told us they would often skip the system, while nurses tend to use the system even if the physician skipped it, they (the nurses) would come back later to either document in a poor way or to document the information. H2N2 stated: *“Yes, for them it is like that, some of them.”* Moreover, when asked again if the patient refused, the participant confirmed her position to record the information: *“Still, alcohol can cause underlying problems, liver problems, which has not been noticed initially, but maybe, it is later will be noticed, so, it is necessary.”*

In this theme, we can see a clear difference between nurses’ and physicians’ responses; all 32 physicians have told us that they will not record patients’ sensitive information and will resist the system and even record misleading information on purpose. In contrast, some of the nurses still, despite how the information is culturally inappropriate to the people, will still record it. Furthermore, unlike nurses, this shows that **physicians are more resistant to the system**. This could be attributed because we believe that **physicians care more about patients’ privacy**. For example, all physicians have expressed that they will not record patients’ information if they do not want to or if the patient asked them not to, and as explained before, some nurses have expressed the opposite. For instance, H2N2 said: *“If it is relevant to the patient, yes, it should be recorded.”*

However, physicians have another saying about recording patients’ information. To illustrate, H1P1 expressed that he is not free to record patient information; he first needs to gain patients’ approval to type any information regarding the patient. H1P1 said: *“So, for me, I usually take the permission before typing the information.”* Additionally, this has been supported by other physicians, yet he thinks that there is information in which, as a physician, he knows that he should not ask whether it should be recorded because it is socially inappropriate. H1P7 said: *“For alcohol which we as physicians do not write alcohol at the EHR.”*

This might be related to how Saudi Arabian physicians view themselves at the hospital, as they might consider themselves at the top of the hierarchical chain within healthcare organisations. Hence, they will resist the EHR system, even if that means they will break the hospital policy, which H1P4 expressed firmly when he said: *“If the system does not serve his best interest, then we will not work with it.”*

This confirmation was repeated by H1P5 when he re-stated the importance of patients’ confidentiality and that he would not work with the system when his patient information was threatened. H1P5 said: *“We should not actually use it when his information is threatened.”* Further, H1P7 explained that they resist the system because part of their role as healthcare professionals is to protect the patient and not lose patient trust. H1P7 said: *“Yes. Because it is patient information, and it is confidential. He trusted me with it. Stay with me.”*

Physicians have further expressed how much they do not trust the system with their patients’ information, for instance, H1P15:

*“I am against that. [...] I do not want information to be shared electronically. If it is hand by hand, then maybe I might be okay with it. I know it is wired or might be wired, but it is my personal opinion, I will not transfer or share any patient information with the system because I don’t think it is safe for the patient, I don’t trust the system.”*

H1P15 further explained his view and said:

*“Mistakes could happen, computers can be hacked and for me, patient information confidentiality are important. Anyone could have an easy access to the information.”*

H1P16 backed this argument and included a comparison between the EHR system and paper-based records and how he feels about both of them as a healthcare professional:

*“The accessibility now is more than before in computer. Paper era, not everyone will check papers because they might be afraid, you will lock the*



*files in a room, close it, and someone will guard this room, no one can get near it. But now, cybersecurity and this stuff.”*

Some physicians have stated that even HIV should not be recorded, and they will not record it Consider what H1P16 said:

*“So, when the patient visits me, I have to write a report; in my report I do not need to write that he has HIV if the patient wants, because he might want this report to his job, so I will not.”*

However, this behaviour can hurt other healthcare professionals, such as nurses. Nurses stated they were upset about it and expressed concern about not having sensitive information about the patient. She advised that information such as Covid-19, and HIV, which are communicable infections (and can therefore be transmitted to other people), are not in the EHR system and should be recorded despite patients’ wishes. For example, H1N4 stated:

*“Especially for the patient we have sexually transmitted diseases. Sometimes it is kept confidential. But, seeking for our protection, for our own health so we don’t get infected. [...] Like it does not tell us whether he has this disease or whether he using a drug-addicted, I did counter it many times. [...] We can say the majority of the times is not mentioned in the system. So, it is really important. [...] Other transmitted diseases are not mentioned very well. [...] patient has STI [Sexually Transmitted Infection], patient has HIV [Human Immunodeficiency Virus], whatsoever kind of disease. Like of example, some of the patients might be suspected for Coronavirus; we do not know!!”*

In Saudi Arabia, between February and March 2020, Covid-19<sup>19</sup> cases increased massively. However, during that time in Saudi Arabian hospitals, when someone was diagnosed with Covid-19, some nurses noticed that some physicians would not record this information. This might be because those patients are their relatives, so they will help them to cover up their illness, as people in Saudi Arabia at the beginning of the pandemic

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<sup>19</sup> More explanation can be found in Chapter 3.

considered the person with this type of illness to be cursed. Hence, they get away with it by recording them as healthy individuals and not recording the information or that they have Covid-19.

Furthermore, another sub-theme highlighted that could also be attributed to why physicians resist the EHR system more than nurses, is that ***physicians resist the EHR system via expressing their authority to their colleagues***. Some physicians: particularly consultants and fellow, because they know that they have authority over residents (while consultants have authority over both the fellow and resident physicians), they will resist the system by asking another colleague to use his EHR account either to write patients' information or even to use other's EHR account (i.e., fellow or residents).

However, expressing their authority has been recognised during the interviews for multiple reasons. For instance, as explained earlier, to *get away from a medical error*, or *maybe simply not wanting to use the system* and *using their authority and power to request the residents' physician to write on their behalf*. For example, H1P1 said: *"Our residents, our fellows help us in this and help us in the entering information patient."* Other interviewees have repeated this statement. H1P12 confirmed that he would make the junior person (the lower ranking physician individual) write his account instead of him to make time for him to do his job faster: *"Sometimes if it is difficult, I do not do it, or I make the intern do it so I can do my job faster."* In addition, H1P11 has also confirmed that he will not use his EHR account and will let the junior physician do that work for him: *"Usually, the most junior person will write the judgment, for all the teams and in everyone's account, or we copy and paste what he did."*

Nurses have also supported this sub-theme by highlighting that they ***sometimes help physicians do their patient documentation instead of them***, despite their acknowledgement that it is not part of their role as a nurse. For example, H1N4 said: *"I can help you, I have done it sometimes, but it is not my role to do it."*

Another sub-theme is ***using their relationship to resist the system***, which means that both types of participants (physicians and nurses) will use their relationship with their colleagues to not use the system or to get past the system when it restrains them from

doing their work (e.g., requesting medical prescriptions). This sub-theme has been identified by both participants, despite some differences in how they can use it, which will be illustrated in the next paragraph.

Some physicians addressed how they can get past the system when it undermines their authority in medical prescriptions via ***using their colleague's EHR system account***, or they ***are asking anyone they know to write in their account***. For example, H1P9 said that he would use his relationship to get past the EHR system and do his job with his consultant's account, as they have the authority to request something which he cannot do by his own account as a lower rank physician: *"I can do it with my consultant account."*

This action was explained by H1P7 when he tried to justify using his relationship to work on his colleague's account. H1P7 said: *"I can do nothing because of the system; I should have some authority to do something for the patient."* This statement has been supported by H1P9 and said: *"Sometimes new doctors will have to use my account."* Another physician participant has highlighted that they will ask others to use their account and write on their behalf. For example, consider what H1P1 said: *"Our residents, our fellows help us in entering information patient."* This statement has been backed by H1P10 when he said he makes someone he knows to do the job for him: *"Sometimes, I ask anyone I know to come and write to my account."*

These data highlight that the respondents will get past the system and use others' accounts as a way of resisting or misusing the system, and they have also expressed their willingness to do it if it will diminish their authority or affect their job. Furthermore, because they have a close relationship with someone at the lab, they use this relationship to pass the system because the system is not easier to deal with; for example, H1P11 said: *"Sometimes it is easier to call the lab to send them through email."* This has been confirmed by H1P16 when he said: *"Sometimes better to call lab than just looking for it in the system."*

However, regarding the nurses, some have highlighted that they will use their relationship to make physicians resist the EHR system by not recording *their relative's information*, as it could be accessed by their colleagues regardless of their position in the hospital. This could be seen because they do not want their colleagues, for example, to

know their relative's health issues, especially if it, as we mentioned earlier, could be socially or religiously related (e.g., mental health problems). For instance, H2N3 said:

*“No (laughing), because now everyone can see it. We have access to pretty much everything, even our colleagues; it is so easy to get access [...] Because our system, everybody can access it regardless of your position.”*

In addition, another form of relationship has been expressed by nurses only, which is a **close connection**, and they have highlighted their ability to get past the system to order medical prescriptions and perform lab tests because they have a close connection or close relationship with their physicians' colleagues. To illustrate, H2N3 explained that she could sometimes get past the system and not use it because she has a close connection with one of the lab teams to order a lab test for the patient, even though nurses do not have the authority to ask for one:

*“Sometimes you can do like MRS, [...] when you have a close connection with one of them you can be like I hope you do not mind, but I have done this.”*

This was reinforced by H1N3, who advised that *“Sometimes if you know the doctor, you can do it by yourself”* when asked whether they can order lab tests (despite nurses having no authority to do it) if they have a solid personal relationship with another colleague who has more authority than nurses do. H2N3 agreed that this was indeed the case. She also declared that they also **share their account passwords** with colleagues to make the lab test orders because of this close connection. Specifically, H2N3, when asked whether she makes those requests from her or her colleague's account, responded with *“sometimes from his [EHR].”* They also expressed their ability to **change the patient lab results**, such as HIV, before it goes to the file to protect his privacy if the information is harmful. The H1N5 said, *“In the lab, yes, he cannot change the result; in the file, no.”*

In addition, another sub-theme identified by physicians and nurses is **resistance due to the complexity of the EHR system**, which in this research refers to the ability of the users to use the system without facing any difficulties. For example, H1N1 answered when asked about how the system process to get her job done:

*“We have plenty of things to do in order to achieve a goal. [...] if you followed the system step by step, it will take a long time. [...] The system is designed and planned to be used smoothly, but nothing goes smoothly as planned.”*

This was built upon by H1N2, who advised that *“First, I want it to be fast because it is so hard to navigate, and to check things if it is hanging and lagging.”* Therefore, they will get past the system to continue their work to avoid system complexity. Physicians have also complained about the complexity of system navigation. For instance, H1P7 expressed his personal view as a healthcare professional: *“It is an issue with how the system work, it is a personal issue [...] Our system is very difficult to navigate, the EHR is very difficult.”*

Another confirmation of this view came from H1P8 when he said how he feels as a healthcare professional that the system is not well organised, and not good for healthcare professionals. H1P11 also gave his opinion of the system and referred to how the images are not easy to review when needed: *“You are not easily able to review images from the system.”* Another participant has raised the concern of not being able to track patients' previous visits due to the system's complexity, which will cause them to have difficulties in making medical decisions. H1P16 said: *“If you want to go back and look for what is this in your visit, or follow up on a test or things, you will have a difficult time to reach it.”*

H2P6 and H2P11 have reinforced these claims as they stated: *“Navigating certain things can be a bit of hustle sometimes” (H2P6)*, while H2P11 said: *“But the way to reach the information it is hectic [...] I do not like it. It is complicated and not user friendly.”*. Therefore, here the participants are not comfortable about how the system is not supporting their daily tasks as professionals; hence, they engage in resistance behaviour towards the EHR system. However, we have noted that all the participants from H1 have motioned this problem specifically, while only two from H2 mentioned this problem specifically or motioned it differently, such as how the system is hard to get the information from.

A common view among interviewees was **resistance due to lack of training**. It is one of the sub-themes that both physicians and nurses have noticed. Some of the physicians and all nurses' participants reported the **lack of continuance training, sometimes lack of**

**training, and training is not from a healthcare professional's instructor** the hospital gives them for the system, which could result in medical errors.

Nurses have also agreed that **lack of continuance training** about the system is one of their main problems and one of the reasons for not using some of the EHR functions. For instance, according to the nurses, the system is constantly being updated, and with the new updates come new features which they need to know and familiarise themselves with. For example, H2N2 advised that *"The learner will be just physically on the job not from the training, it was not enough."* Similarly, H2N4 stated that:

*"But not all the aspects of the system itself. For example, we have an application here in [H2] called [...]. So, we are supposed to enter and open this one on a weekly basis and know about it, but because I am not familiar with this one. [...] I do not think the system was fully explained to us. When they have a new application, they do not give us an educational session about it. I feel like it somehow not reliable because we do not use it in a proper way, so not all the information is there. [...] Because they didn't give us an educational session about it."*

Furthermore, another participant stated that they had absolutely no training: *"No, we had ZERO training, and subsequent updates"* (H1P6). Here the participant is dissatisfied with how the hospital does not recognise the importance of training physicians to use the system and any updates that come to the system later. So, for example, if the hospital wants healthcare professionals to use the system, they need to improve their capability and educate them about it.

In addition, many participants have supported the above statements. To name a few, H1P10 expressed that he received no training at all: *"There are no workshops, no orientation, [...] when I joined in the hospital, they should have taught me how to use it, at least for two hours."*

H2P6 confirmed that, and he said he learned by himself: *"I have not had any training; it was mostly figuring it out by myself."* H2P9 said this is incorrect, and they should give them training because there are things you cannot just learn by yourself, and they need to be

trained for it, which is why they resist the system or fail to take full advantage of the system functions. H2P9 said: *"It is correct that there are some things that are complicated, which you need a course in order to understand it."* This could be related to how managers in Saudi Arabia do not care about training their employees; hence, the outcome, as we can see from the data, is resistance to the system, and employees are having difficulties and being less efficient in doing their job because of such mentality.

### **5.2.2 Resistance to the EHR due to the Healthcare Professionals' Role being Threatened**

The second theme is **Resistance to the EHR due to the professionals' role being threatened**, which can guarantee a prestigious status for the role holder with autonomy and a degree of privilege (Slay & Smith, 2011). Role identity provides a "definition of self-in-role and includes goals, values, beliefs, norms and interaction style that are typically associated with the role" (Chreim *et al.*, 2007, p1515). These explanations show the professional role's importance to professionals, especially Saudi healthcare professionals.

Hence, many sub-themes have been generated from the interviews that could be related to this theme. For example, ***resistance because of a threat to the healthcare professional's performance***. Healthcare professionals' performance refers to what a healthcare professional believes should be the standards to which they accomplish their work. Hence, when healthcare professionals such as physicians and nurses think that their performance at their job is not what it should be, they might feel dissatisfied with their work, and in a healthcare context, the ***quality of patient care delivered by the physicians*** when using the EHR has been affected negatively.

Quality of patient care refers to the healthcare professionals' belief that using the EHR system will affect care quality for their patients. To illustrate, H2P6 said that the EHR system is slowing him down: *"It might be slowing the physicians down."* He further explained and confirmed his statement and explained that he would resist the system because of this. H2P6 said: *"If I feel it is not allowing me to do my job in my full capacity, if I feel like it is slowing me down, I will get past it."* This statement has been backed by H1P2 when complained how it affected his priorities and work.

Physicians here expressed how they believe the system is not helping them give their patients the desired care they should have. However, on the other hand, nurses said they ignore the EHR system because it **does not provide accurate information about their patients**, as relying on the system will affect their professional performance. Many nurses have stated that the information they provide is inaccurate because they only need to fill out the gaps requested by the system and the hospital. Therefore, they avoid using the system when looking or searching for patients' information, as they know they cannot rely on it, and instead, they start making a new diagnosis themselves or ask the nurse on the first shift about the patient. For instance, H2N3 said: *"Everything is almost like a tick box, give the medication, do the vital signs."*

Nurses have also complained that the information in the system is generalised, and they are **purposely not recording the right or accurate information** due to the pressure from the hospital and **quality management control department** to record the patients' information within two hours of the end of the consultation time. Also, due to the system, which should be more specific to each unit at the hospital. According to the nurses' interviews, this policy makes them only want to record any information, whether it is accurate, or sometimes only ignore the two hours policy in order to give more accurate information to their patients. Consider what H2N3 said:

*"I feel like we have different patients with different conditions, different needs, different services, so when you look at the system, [...] so we have for example assessment, patient A and patient B will not be the same, but if you looked at the documentation, most likely a person who has not seen the patient physically, will look at the physical assessment, he will say 'Oh, they look the same'. But, when in reality, when you do view the patient, it is two completely different patients, but it is so generalised. There are sections of the assessment which allow you to differentiate between two patients, but there are small little things like maybe the weight of the patient, but when you want to have a general assessment of the patient, I don't think you will get that from the assessment. [...] The assessment is not individualised."*

H2N4 reinforces this because, according to the interviewees, they do not have the time to record information within the time frame requested by the quality management



department. Therefore, they either engage in resistance behaviour by not writing accurate information or simply not using the system. H2N4 states that:

*“The paediatric system [for example], is general, it is not [...] specific for us, the problem is, that when you need information related to something about paediatrics, it will not give you something [...] you need to dig deep to know information.”*

H2N4 further goes on to state that she will not record in the system within the two hours, and she will not be pressured to record while she is busy with taking care of the patient, so she will risk being expelled from her job rather than recording inaccurate information. H2N4 stated that:

*“What I do now, I don’t comply within these two hours. I start at the time that I want, because I know within those two hours, if I did not put the information, they will count it as a ZERO work. For me, this is not problem, count it as a ZERO work I do not care, rather than I am putting inaccurate information just to satisfy the system or the administration. And for me I am sitting with you I have not done my documentation for the morning, because I feel like I have to carry out the tasks first, not the document itself.”*

However, this has resulted in a **lack of trust in the EHR system** among both types of healthcare professionals, with differences in how they have lost trust in the EHR system. For instance, concerning the nurses, H1N4 stated that *“Most of the time we do not rely on the system’s information. [...] We do not have confidence in the information available at the system.”*

Nurses also expressed how they **purposely abused the EHR system by recording wrong information**, not because they wanted to, but because they must; otherwise, in their opinion, it would affect their job and the patients’ medical plans. Consider what H2N4 said:

*“Because [...] we do things just to do what the system wants, not what we need, and not because of the facts that happened. Because if you entered the*

*facts, it will give you another reading or another understanding. So, that will affect my work and the patient information and management plan.”*

Similarly, H2N3, when asked about the assessment and whether it is a reliable assessment of the patient's situation, she said it is not, as they do not fill out accurate or complete information. She advised that:

*“[...] Sometimes it is time-consuming. So, you will spend, let us say you have a minimum of four patients a day, so, each assessment will take you probably between 20 to 30 mins, so, could you just imagine you have got four patients, and you have 20 to 30mins each it is not enough. And also, we are expected to complete our documentation assessment within the first two hours of seeing the patient. I do not think it is realistic, and I definitely do not think is an accurate assessment. [...] when it comes to assessment, it is definitely something I don't agree with, because it is not accurate, or reliable assessment.”*

Furthermore, this will result in the patient care process not being fulfilled 100% due to them being busy documenting something they do not rely on. H2N3 said:

*“My point is, as a nurse, we 80% of our time on documentation, and I feel like nurse is more of a practical thing, and I feel like if we are putting so much pressure on documentation, is the patient care is being fulfilled 100%? [...] You know, and I feel it is probably not, because you know we do not even have that time to provide it. Everything is almost like a tick box, give the medication, do the vital signs, but do you actually have that time? It is like you are a robot; you are only ticking boxes.”*

Concerning the physician participants, they explained how they lost trust in the EHR system as it does not enhance their professional performance due to inaccurate information on the EHR system, or how the system is not stable, and what that could mean to them as healthcare professionals. For example, H1P6 is complaining about how his trust in the system is damaged and how the system can cause deadly consequences for the patient because it is not a stable system:

*“Sometimes, while entering information or requesting lab or services for a patient, my system will switch patients without telling me. It is the weirdest thing, I would click on patient A and request something for him, and I saw patient B previously at the clinic, so the system will switch them, and I will be entering information for the wrong patient without me noticing that which I find very dangerous. It made me very scared, so I must double-check everything again and again.”*

Hence, as a consequence, when H1P6 was asked how he feels about this and whether the EHR system, in this case, is reliable, he responded with: *“Definitely no. it is completely unreliable.”* This statement has been backed and enforced by another similar statement from H1P9 when he complained about how the EHR system is increasing the chances for medical errors: *“You might make mistakes very easily, which is the opposite of why the system has been implemented in the first place, which is to reduce mistakes.”*

This resulted in what H1P11 expressed about the system *“It is not a reliable system by any means.”* Furthermore, they also do not trust the system because it does not correct their information. Sometimes, they make mistakes while entering the information, which cannot be undone. This makes them call other colleagues to inform them about the situation and that some information is incorrect. Hence, some physicians get informed, and some do not; therefore, they do not trust this information. For example, H1P7 said:

*“Our system does not allow us to correct the info. So, at the moment you clicked enter, that is it, you cannot change it [...] Sometimes, you know, when you're not very concentrating, and you put like patient A data to patient B file. So, if you want to correct that, it's almost Mission Impossible.”*

This could be seen from a cultural point of view, and this interpretation is supported by H1P7 when he motioned that his feeling about the system trust is a personal feeling: *“It is an issue with how the system work, it is a personal issue.”*

However, ***physicians purposefully abuse the system*** differently and with a different intention than the nurses, which is documenting wrong information to protect their patients from society’s judgment about their illness. They believe doing this is one of their

roles as healthcare professionals in Saudi Arabia and that they must protect their patients' sensitive information from being seen or used in a harmful way for the patient. For example, H1P6 when stated previously that he stopped documenting accurate information in EHR which are socially taboo such as drugs and alcohol.

Another sub-theme generated is the **high reliance on the EHR system**. Physicians expressed how the system now plays a significant role in stealing their role as professionals and turning them into robots. In the data, physicians complained about how the system causes them to depend on it in many ways (e.g., medical judgment, prescription, diagnoses). This causes them to lose valuable medical skills that contributed to their professional status and guaranteed high prestige among others.

*“Sometimes, we rely on the system to see how the patient is doing vitally. We would see their vitals and their blood pressure, I mean, sometimes, according to that, we judge that the patient is stable. However, there is always a clinical perception, you still should go and ask the patient how they are, because their vital does not reflect their feeling, [...]. But sometimes we would look at numbers and judge a patient according to numbers, which is not very correct. You should see the patient itself, and ask him how he feels, rather than treat them according to their x-ray or lab, or what the system says” (H2P8).*

H2P8 continued and also advised that:

*“I think no matter how technology is advanced, there are certain human things or features cannot be replaced, critical thinking and passion [...]. Human brains are different than systems; system is about input and output, human function differentially.”*

Here a physician expressed how depending on the system should not be the main thing for them as a healthcare professional, as it could be wrong. Additionally, because of their high dependence on the EHR system, many physicians expressed **how their physical examination of the patient is now reduced**, which leads them to think that the **EHR system is causing physicians to lose their medical skills**. A couple of physicians have

reported this, which means that because the hospital administration requires them to use the EHR system in almost everything, they are now losing their medical skills.

To illustrate, H2P7 explained how EHR reduced their contact with their patient when he said: *“The contact with the patient become less.”* H2P7 then further explained what the results of less contact with the patient are because of their heavy reliance on the EHR system:

*“What is lacking, the physician judgment for the patient condition. Am saying that we should not rely on the EHR, sometimes we should do it both the system and physical. It is the hard bit, but you need to see the patient also.”*

The statement by H2P7 of how the use of the EHR system causes them to lose their valuable medical skills has been supported by other physicians. For instance, H2P10 highlighted his opinion and added how the EHR use affected his physical and mental skills: *“I think the physical contact with the patient and physical examination is less now. Very less. We now depending on the machine, not the science in our head or skills.”*

H2P10 further goes on and explicitly mentions that this problem is one of the EHR problems that he is facing as a healthcare professional: *“This is one of the system limitations. It affected my skills as a physician [...] with the system, everything changed now, and it is limited; our skills have been affected negatively.”*

These statements and views are shared among physicians; hence, they have stated that depending on the EHR system is wrong because it does not enhance their skills as healthcare professionals. H2P6 said: *“Dependency on the system is a challenge because it is not a reliable thing at the end of the day. It is a system.”* Here, physicians expressed how they are now doing fewer physical examinations and are **resisting the system due to a lack of time with the patient**. Physicians believe their job is not to stay in front of the screen all the time, as the system has taken them away from their fundamental role, helping the patient. For instance, H2P5 expressed how he feels that as a healthcare professional, he is not practising his profession anymore because of the EHR system: *“Personally, I feel like we are practising medicine more in front of the screen instead of the patient now.”*

H2P7 further supported his statement and explained how badly the EHR system is impacting on their profession, as they are not being able to have consultation time with their patient. For healthcare professionals sitting with their patients is essential. H2P7 said: *"I think it is bad; I think we need to balance this thing; what we have now is extreme; we do not see patient."*

Furthermore, they also expressed how they depend on the system because now they are being assessed by the hospital administration, not by their healthcare professional clinical skills, which they have spent many years developing and learning. Instead, they will be assessed on their IT skills; they even expressed the pressure from the administration to have high IT skills; otherwise, they are not wanted. For example:

*"Now, as a physician, you have to be excellent in computer, you have to write faster, to finish your job. Rather than to be only a physician. No, a physician you should read every time, and express your knowledge. Now you are only typing, and not only typing, there has to be a certain style, colour, font and the pic, whatever you do on the system will reflect on you. Before, a good physician known in his treating patient physical examination. And process thinking can be seen. Now, no, from what he is doing on the computer, [...] It is not good" (H2P7).*

On the other hand, nurses expressed that they would **resist the EHR system due to failure to provide psychological care to their patients**, which could be their equivalent to medical skills for physicians. Nurses believe that their job is not only to give medication or see a patient but also to include compassion, talking, understanding and giving the patient the psychological support they need. In addition, they believe the system has taken away this one aspect that makes nurses better than physicians, in their view.

Further, nurses understand that physicians do not have the time for their patients, but nurses should have this time as their job is to take good care of their patients. Hence, they highlighted how sometimes they would not use the system for a full day just to take better care of their patient. For instance, along with H2N3's statement above around tick-box exercises and how she feels about her role now as a robot, not a nurse, she also advised that:

*“Me personally, nurse is providing that therapy care as well as the medical care, it is not just about the medical care you know? What about the psychological care, and do you have time for that? I do not think we do because we have much time invested in our documentation in the system. [...] We should be having more time with our patient, because sometimes that is what they need, or sometimes you might be missing vital information because sometimes you have a patient readmitted.”*

This action was also performed by H2N2, who stated that she would also try to “*get past it sometimes.*” They feel this way because they believe listening to their patients is an important way of treating them. Hence, when you ignore spending time with your patient, this will reflect badly on you as a professional and your patients because they will probably be readmitted to the hospital, and if we still do not listen to our patient more, then the same thing will happen. H2N3 said:

*“When you look at the reasons why the patients have been readmitted, is poor compliance, then you ask yourself, why this patient is having a poor compliance you know, why they have been readmitted, but that because there is something deeper of what you actually think, and we have missed it because we are so pressured you to know doing our documentation and relying on medical, as I said go back to given medication because you are so under pressure, to tick those boxes that you have to tick at the end of your shift, and that you have probably forgotten the basic thing like communicating and therapy, emotional connection with your patient.”*

Some nurses have also said that when they are busy, they will sometimes let others record information on their accounts instead of them, which is surprising as they said that people should take care of their patient's privacy and not allow anyone else to enter their accounts. For example, H2N4 confirmed, “*Sometimes, yes, especially when I started here, yes. I will open my ICIS [Integrated Clinical Information system] and let someone do it for me.*”

The outcome of the resistance to the system because of the above problems that nurses have expressed is **wasting time documenting useless patient information**. Nurses have

expressed that they cannot do their role and give a proper service to their patients and that their medical plan has been interrupted because of the lack of information, which is the cause of generalised information or inaccurate information. H2N3 explained this point when she said: *"I am just wasting half an hour documenting something which does not even give a clear picture for the next person who is taking over, or even the physician taking over to say what is the status of this patient."*

They have also expressed that their job or even an operation for the patient could be delayed because they lack the information about the patient in the system or they lack the authority to use it. For instance, H2N2 said about the lack of information and how it has affected her professional role: *"We do not know the previous history unless the parents<sup>20</sup> tell you or unless we have a hard copy with us."*

H1N3 have also expressed a similar point about how a lack of authority to access patient information in the EHR system can cause delays in doing her job. For example, H1N3 explained how this could affect her professionally when she said: *"In a way that cost delays in operations, and I will not have good information or enough to carry out my job."*

Therefore, when the nurses' participants were asked whether this problem affects their role and work, their response was yes. For instance, H2N1 said: *"Sometimes yes."* This was elaborated on further by other nurse participants. H1N4 confirmed this statement when she said: *"No, it does not impact upon my work in a positive way."* H2N3 further explained how she feels about this problem:

*"Because when I come in a shift, I am relying on the nurse finishing the shift to give me accurate information about that shift. But, if [...] whatever the nurses' document is not accurate, for sure it is affecting me because now I have to go out there to find that extra information."*

Another sub-theme noted is that physician participants think of the system as a **surveillance tool** to monitor their work; hence, they will resist it. This refers to how the system controls or limits their work environment as a healthcare professional. Thus, they

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<sup>20</sup> The nurse here were referring to a patient who is in a coma or cannot speak, or even a child. Hence, due to lack of information they only have their parents as an example, to ask.



will resist using it when they feel they cannot practice their profession freely because the system does not allow them to. For example, when asked how he feels about the system, H1P10 said: *“Yes, it controlled.”*

In addition, other interviewees supported this claim. H1P14 said that when asked how he feels about the system, and whether it is monitoring their steps, he responded with: *“If you have an electronic system, you are going to be monitored.”* H2P8 explicitly mentioned that the EHR system is a surveillance tool in which the hospital monitor healthcare professional and control them: *“I can say that this is a surveillance tool.”* This is backed by H2P4 when they said:

*“There is always someone that is following up with me [...] We are being monitored, any medication that we dispense, why you dispense it why you put this amount. Yes, we are being followed up, we have a lot of restrictions, they will tell us that we have to give the patient this amount of medication for this period of time, and that is it.”*

When physicians feel they are being monitored or controlled, the result will be as seen, or as we have been told: they will resist using the EHR system. The resistance is the cause of their feeling of being controlled, which is the opposite of their profession, which is having complete autonomy in their work. There are many reasons why physicians feel the system controls them. For instance, they felt the need to **justify their medical treatment plan to the system**; otherwise, it will not accept their medical plan for their patient. To illustrate, H1P8 said:

*“If I trust my judgment, I will avoid using EHR to prescribe what I need [...]. if I 100% trust my judgment, I should go for it, I shouldn't be restricted by a system. So, the system as I see it should not restrict me from doing my job, he is there to be a reminder.”*

Another physician echoed this statement when he included that because of the EHR system, pharmacists now have a say in what physicians can or cannot prescribe. H2P9 said:

*“For a physician, if he has a judgment, he will put the plan and judgment. Maybe the problem be with the pharmacy he would say the system said this is wrong so, I would not prescribe this for your patient, so, this yes might be the problem.”*

Physicians believe they should not justify their medical judgment to anyone, as they are the expert, not the EHR system nor pharmacist. Other participants have expressed their dissatisfaction with the **quality check control** and how it affects their priorities during work. They have highlighted how physicians have a timeframe that they should stick with from the hospital administration to document their patients' information or answer any question from nurses or other colleagues that comes from their system; otherwise, they will get a note on their quality performance. They are also worried because they are **being assessed based on their system usage, not their skills as healthcare professionals**. For example, H2P11 said:

*“We have to reply within 30 mins if we did not answer within 30 mins or document it. Otherwise, a note will be issued by your performance. It is a quality thing [...] you can reply later, but a note will be submitted about your late reply.”*

Therefore, they will ignore or resist using the system to document the information during work, and they will do it after they finish their work at the hospital. However, this could cause late information documentation that could be useful for other physicians or nurses to have an update on the same patient, which we have noticed in the beginning. H2P11 advises, *“Sometimes my work is from 7:30 am to 5 pm, and I finish everything, but I do not document; when I go home, I do it there.”*

Nurses reported that the **system is controlling them**. Nurses believe they should have the flexibility in their job to work at their best for themselves and the patient. Hence, they will resist using the system by not complying with what it is saying or using their relationship or close personal connection to get over it. However, the system is a different story; they have highlighted how the system now controls how they do their work, affecting their role and autonomy. For example, H1N1 advised that *“The system now*

*dictates that the nurses will do such things”, which was reinforced by H2N4, who stated that “It feels like [it’s] controlling me.”*

### **5.2.3 Resistance due to Healthcare Professionals’ Autonomy being Threatened**

The third theme is **resistance due to healthcare professionals’ autonomy being threatened**. Professional autonomy refers to how professionals’ have a full control over their work without supervision according to their collective and individual judgment, and trusted to be self-regulate (Walter & Lopez, 2008). Hence, threat occurs when the professional or personal values of the person are threatened (Petriglieri, 2011). Many sub-themes have been generated from the physicians’ and nurses’ interviews; some even reported the same concerns.

When it comes to physicians, for instance, they have reported that they **do not have an EHR account on the system** or that **their account is a visitor<sup>21</sup> account**. For instance, H2P9 said: *“We have an account, but this is a reviewer account, we cannot do any requests or submission and anything. It is only to review.”*

H2P6 have explained how she sees healthcare professionals, especially residents, suffer because of not having an EHR system account, and she confirmed this is affecting them, and they will not be able to use the system which limited their professional autonomy. H2P6 said: *“Yes, definitely it is affecting the residents currently, and I am sure it will affect me when I become a practising physician.”*

Physicians here expressed their dissatisfaction about how the system is limiting their ability to perform their job, and this will result in their resistance to the system as H2P6 explained earlier about how they will get past the system through using their relationship with colleagues, which we have explained earlier, to get their job done. Also, it was

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<sup>21</sup> A visitor account means that the professional does not have the ability to do their job, the system is only allowing them to view information, and even if they want to view anything, they must make a request for it.

expressed how Saudi healthcare professionals prefer to have autonomy over their work and not relying on any other colleague to do their job.

In addition, for nurses, we have identified a sub-theme which is that the **system is limiting nurses' autonomy** by **denying access to their patient information** and **having limited time with their patients because of the EHR system**. For example, H2N4 explained how she was not allowed to look at the information that directly linked to their jobs and advised how it affected her autonomy: *"The system, yes, there is sometimes information I want to look for it, I am not allowed or authorised to look at it."*

H1N5 supported this and further explained how it has affected them when they need to have important information about their patient. H1N5 said:

*"Yes, sometimes I do not have access for everything. [...] Sometimes, I need something, I want to review my patient's history, I cannot do it, because I don't have access, not all the care providers have the same access, which is annoying, I should have this access, it is my job to check upon my patients, I should not take approval for the access. This is bad for me."*

Access to patients' information is an important task and considered to be a core task of the job of physicians and nurses. Without complete information about the patient, nurses will not be able to make a judgment during critical times for the patient. This, however, will affect their judgment and might result in medical errors or even threaten their patient's life, resulting in their professional self-perception being damaged. One of the nurses H2N2 explained this situation and said:

*"The drawback is what I want to talk about. Why? Because [...] if there is a failure in the system [...] we find it difficult to deliver the patient care. Because everything is built up in the system, we do not have a hard copy of the medication [...], about the condition, suppose the patient newly admitted, we do not know about the previous condition, suppose the patient is a cardiac patient, and the patient is having hydrated or whatever it is."*

Furthermore, how the system limits nurses' professional autonomy to do their job has resulted in patient frustration. Many nurses expressed their problems with how the system is taking all or most of their time, which they are supposed to dedicate to their patients. For example, H2N2 advised that:

*"Yeah, a few Personal Computers (PCs), and then the nurses when set and work sometimes when it is slow, do you think you can sit in front of the system all day because he is slow? You know you have other work to do so will leave it and go-ahead to do the other work. And at the end of the day, the nurses are stuck with the system work alone you know. I feel that if you have something like a hard copy or something that you can just transcribe on that it is easier than the slow system. But what they recommend to us is always to use the system, and there should not be a hard copy."*

H1N1 similarly stated the same argument; however, they further included how the EHR system, despite its offer to make nurses' jobs more flexible, will always push them back from doing their job. H1N1 said:

*"Let us put it like this. No matter how flexible I am I will be still in the box because of the system. So, no matter how I do my best to be flexible, if the system says I should act in a certain way, I should act in a certain way."*

Participants also expressed how their patients feel about not having that much of their time to spend with them or not paying more attention to them during their consultation time. This will influence the nurses' image in front of their patients. For instance, H2N1 stated:

*"Your patient will be frustrated that you are doing some in the system related to the other patient because you have different patients, you don't have only one patient, and I haven't finished from that patient, you still continuing on the system, and that patient he needs something, so the patient gets frustrated. And you cannot explain to them, like, sorry, I am doing something on the system, they want his things first."*

However, physicians and nurses expressed a shared concern about how the ***EHR system has limited their authority as healthcare professionals***, despite the differences in how their authority has been limited or affected by the EHR system. For instance, physicians and nurses reported how the system limited their authority with medical prescriptions or medical plans, which affected their work and how they helped their patients, as this influences their autonomy as healthcare professionals. To illustrate, H2P1 highlighted how MRI scans now cannot be requested from his EHR account:

*“What I cannot access is [...] more like to carry on the plan is some investigation, which I cannot order, and it has to be ordered from seniors. For example, doing the MRI [Magnetic Resonance Imaging], I cannot order it myself, it must be done through a consultant.”*

H2P1 expressed how this problem limits their professional authority gained because of his profession as a healthcare professional. Another participant, H2P2, confirmed the above statement when they said: *“I have limited access.”* Nurses also spoke about this problem, despite their different opinion. Nurses believe they should have authority at least during an emergency. H2N2 said:

*“You know when it is emergency, it is annoying, for example, if a kid is having a fever and if the physician order the dose, and nurses we are checking the dose as well [...] but if the pharmacy doesn't verify, you know from the pharmacy we get the medication, we don't have any medication, so, the pharmacy has to get the medication, by the time the temperature sky high, we still don't have the medicine!! We have to wait for the pharmacy.”*

Physicians here demonstrated that they are not happy about how the system limits their autonomy as a physician. They believe they should have the ability and the trust they deserve as a highly-skilled professional and not let the system dictate what they should do for their patients or other people, such as pharmacists, who control their autonomy because of the system. Nurses expressed that during emergencies, nurses might have to request medication for the patient, however, according to nurse participants, the pharmacist, who is supposed to accept their request on the system to prescribe the medication, might not authorise this, or it might take them time to verify the emergency

for the patient. However, this could risk the patient's life and could negatively affect their patient medical situation, as H2N2 reported earlier, and what H2P4 said:

*"Sometimes I think it is too much; for example, if I want to start the medication right away, I have first to order it through the system, to get it from the pharmacy, and that might delay and cost me time to treat the patient. In some situation I need time, this medication is critical in this time, so there are downfalls about the system."*

This was reinforced by H1N1, who stated that "[The system] has undermined some of the potentials, some of the authority," along with H1N4, who advised that:

*"Yes, it is because of the system. As I mentioned previously, the system itself lacks a lot of factors [...]. Either to change it to a better one or to update it, [...]. Some of my roles I do them aside from the EHR because he limits my job, not because my role doesn't matter, but he doesn't specify any of it."*

Physicians have also expressed that other health professional colleagues should not even control them, and even by a consultant, because their judgment will be questionable, and they think they should have the autonomy to practice their profession, for example:

*"For me, no, it is not right. Because you cannot write something that the consultant didn't agree to do it. Like MRI, you cannot order it on yourself if there is no green light from the consultant or from the plan. [...] Sometimes you want to do a simple investigation routine lab, so we cannot do it and we don't have the authority to do the request" (H2P10).*

He expressed that some diagnoses must come from physical examinations, not from the lab tests or the system, as the consultants only depend on and make a decision on the system; hence, patient care is affected because of that, he said: *"Sometimes you can pick from physical examinations, not from labs test or system" (H2P10).*

Hence, as expressed by both types of healthcare professional, they will engage in resistance behaviour through using their relationship, as unless you have a close or

personal relationship with the pharmacist, your order will not be approved in the time in which you need it for. As stated by H2N2, who said, *“You have to call them and say, please verify this medication even though it is a simple medication, but you really need.”*

In addition, physicians stated that when they think the system is limiting their autonomy to do their role as a physician, they will resist it and not use it by using their relationship, as we explained earlier, to get things done. For example, H2P6 said: *“Yes, that is true they do that, call the pharmacy here. And for me, yes, I will do that if it limited my role. I would definitely get past it to get my job easier.”*

Unlike physicians, nurses expressed the need to regain their authority regarding ***the Morafiq system*** that has been taken because of the EHR system. *Morafiq* refers to a representative of the patient if the patient is a female of any age and if he is a male under the age of 18. However, this is usually used when there is a female patient because she must have a male relative with her. This person is referred to as a *Mahram* (Alqufly *et al.*, 2019). A *Morafiq* letter is vital in Saudi Arabia because when a female patient is staying more than one night at the hospital, she must be accompanied by a male, that male might have a job, and he needs a legitimate reason not to attend to his job or school in order to accompany his relative female. Therefore, the *Morafiq* letter is the legitimate reason that a male will present to his employer.

Moreover, before implementing the EHR system, hospitals in Saudi Arabia were paper-based, and the male could get this paper information from the nurses. But, when the EHR system was implemented, the *Morafiq* letter has now has to go through an electronic system and to be approved by the physician, which nurses see as a threat to their authority. For example, the H1N3 nurse expressed how she is not able to serve her patients, predominantly female patients, by giving their *Mahram* the letter they need to stay at the hospital with them. H1N3 stated:

*“Maybe the Watch Your Sleep, it is for the Morafiq of the patient, it is a leave for the Morafiq, you send it because maybe they are working at a company, and the company will demand a leave or proof that he stayed with a patient in the hospital.”*



In addition, some of them have explained how the **system makes them want to quit their work**. To illustrate, H2N3 said:

*“I would love someone to give me that authority; they should be flexible with us and trust our judgment. Without that fear of, could you. [...] I can probably order it, but I will be called to the office, I will be doomed to do that. [...] I have thought about changing the hospital or going out just because the system, the system has drained me and I just didn't agree with the whole documenting things, and not seeing the patients, it is like if what the system says, if what you read from the system [...] then that patient would be perfect, that patient will be the most stable patient ever.”*

This shows how nurses feel about the EHR system and how dissatisfied they are with it. In addition, according to the nurses' interviews, because of the system they are now **changing or modifying their priorities** to comply with what the system needs. Nurses expressed their concerns about how the system has now diverted their attention from satisfying and taking good care of the patient to satisfying the system. Hence, they are changing their priorities to comply with the system's needs, not what they should be doing. This can strain their autonomy as healthcare professionals and reflect poorly on their professional work. For example, H2N3 said:

*“Because previously when we used to use papers, and the doctor were ordered to order, you do not put the time in a specific way. Like he orders it at 11:48, he will say at 12:00, now in the system even the seconds, he will document with this one. So, within 30 mins, you have to carry this one, so it is like controlling me, so I will have to modify my priority. Previously, I was doing the thing that I know it is important to me, but now the system came.”*

#### **5.2.4 Resistance due to the EHR System Damaging Relationships between Healthcare Professional Colleagues**

The fourth theme is **resistance because the EHR system damages relationships between healthcare professional colleagues**. Both types of participants expressed their concerns about the damage the EHR system could cause to their relationship with

their colleagues or their self-perception. For example, both reported **tensions between colleagues** and **fear of the EHR impact on their self-perception**. However, physicians reported **privacy concerns about their personal information** being on the EHR system and how the system might make them involved between two **colleagues have a personal conflict**. Nurses, on the other hand, reported that **physicians are abusing the system** and that the **system is damaging nurses' relationships with physicians**.

**Causing tensions between colleagues** is a sub-theme that physicians and nurses have reported. For instance, physicians reported that they would resist the system and not use it because tensions could be caused by the *wrong medical plan being documented* on the system. To illustrate, H2P11 said:

*“When a senior resident gives a wrong plan if you put his/her [the consultant of fellow] name you will be in trouble because he will come and tell you ‘Why you did this? Delete my name’ and the system will not delete the name, but it will create tension in the workplace.”*

The participant here told us how she has gone through an experience with the system which caused tension between her and a consultant. This resulted in her resisting the EHR system by not documenting her medical judgment or plan because if she did, she would not write the consultant's name even though she is part of the team because she is worried about the consultant's reaction, she said: *“I sometimes do not write as I am worried if I put her name or write anything that whether she will like it or not or whether it is right” (H2P11)*.

However, an interesting thing we have noticed from the data is that another problem arises just because they do not use the system. For example, because physicians are now resisting the system worrying about a wrong medical plan which could cause tension, another tension arises because some of their colleagues can use this to their advantage. This is done by **denying that their colleague asked them to do something** or had a plan they should follow with their patient, and it cannot be proved because it is not documented. Thus, this will cause more tension and could risk the patient's life. To illustrate, H2P4 said: *“Sometimes, even if we are colleagues, we are in a situation, where I ask a person to do something, they did not do it and then denied I did tell them.”*

Some have reported that high-ranking physicians are using the system to create tensions between the low and other high-ranking physicians in the different departments just because she has a personal conflict with that physician, and they placed him in ***between colleagues have a personal conflict***. Hence, they ignore what has been written on the system because the higher-ranked physicians have told them to do so. For example, H2P1 told us his story about how his superior physician told them not to follow the nutritionist from the other department's decision about the patient, just because she has a personal conflict with her:

*"They will ask us to not follow his recommended medical decision in the system or asking us to write in our system that we will not take the recommendation from that person to our patient. This causes us to be in between their conflict, and this is not professional."*

However, concerning nurses' views about the tensions the EHR system could cause, one nurse expressed how she is *afraid to make a medical judgment* because it might be wrong, and when recorded, she will be blamed, hence, not recording any medical judgment. H2N4 said:

*"Yeah, really, this what I do, because maybe I interpreted it in a wrong way, maybe I did not understand. Because some people will misunderstand, and maybe let us say that maybe the information misinterpret it in a wrong way, at the end you will be held accountable."*

***The system damaging nurses' relationship with physicians*** is also one of the sub-themes that has been noticed and which could cause tension between physicians and nurses. The nurse expressed her frustration about not being able to fulfil her professional role as a nurse, and instead, due to the lack of authority, they are forced to depend on physicians to do their work instead of them. For example, H1N4 said:

*"My role here, is to solve the patient issues, no matter how it is. Book appointments, certain labs should be done [...] Dental clearance for a certain type of patient who is going to do a certain surgery. [...] I am limited to it, I cannot do a lot of things, either call the physician, please do this and that, or*

*I take his account, which is illegal, we shouldn't do this. So, every time we pick up the phone or WhatsApp, please do this for this patient, please follow up with the patient, it is not professional at all!! You just keep nagging on him, he has other patients to care about, do rounds, clinics, OR or whatsoever. So, it is really frustrating, a big headache for him and for me. I cannot do my job easily, and I keep reminding him, so, it is really frustrating things, and this put more burden on me and him."*

She expressed her frustration with the need to contact physicians regarding every detail just to do her job, and she described it as unprofessional, making her and the physician uncomfortable. Additionally, nurses have reported that the EHR system is damaging their professional relationship with physicians by causing a lack of collaboration and communication between the two types of healthcare professional, which they believe is essential for patient care. For instance, H1N1 said:

*"The system now dictates that the nurses will do such things, and physicians will do this set of things, so there are times that nurses and doctors do not work collaboratively [...] Because of the system, sometimes it is difficult for the nurse to communicate with the physician."*

Furthermore, another nurse has re-stated this claim and highlighted how the lack of collaboration between physician and nurse would affect their work and patient care. H1N3 said:

*"I have a problem with [...] the collaboration between doctors and nurses. [...] the problem is the system between the teams using the system, the doctor, the nurses like, we really have to collaborate with each other for the patient, they should give us enough information to work with and use it [...] Usually, a poor communication from either our side, the nurses, and the physicians."*

Nurses here highlighted how the EHR system is causing a lack of collaboration and communication between them and the physicians, which will cause a negative impact on their patient care; hence, they will resist the system.

Furthermore, nurses have expressed concern over how **physicians abuse the system** because of the power that the EHR system gave them and how this affects their image as professional nurses. For instance, if a physician wants to send an order to a nurse for their patient, they can send it through the system via the communication order tool (CO); this will allow the nurse to look and see any updates from the principal physician about their patient. Hence, the CO is the formal communication method between physicians and nurses regarding the patient situation.

However, due to the lack of timing or limited time, as we mentioned before regarding time that nurses spend on the system, they reported that some physicians are abusing their power via sending these COs, despite their knowledge that their fellow nurses are not at the PC right now, and too busy to look at it. The nurses request that if they know that we are busy, they should at least understand our situation and come to tell us face-to-face. For example, H2N3 stated:

*“Sometimes people abuse it because they will write a communication order, for example, and for me there is something is important and urgent and needs to be done instantly. Which I think it is to me you are providing a poor case to the patient, and I think neglecting and kind of abusing this system if you like, but others will not see it like that because you know they have used the system they have the privilege to put a CO [...]. So, yeah. [...] People are abusing it, abusing the system. [...] So, unfortunately, sorry to say that will put that order in and fail to inform the nurses. Now, in their defence, they put it in the CO, so there is no argument. For their safe side, I put it in a CO.”*

This action harms nurses’ perception of themselves as a professional and their work, resulting in their resistance to the system. Surprisingly, lower physicians have also reported how some consultants are **abusing their power to avoid medical errors** by making low-ranking physicians write medical judgments in their system instead of in the consultant’s system.

*“I would like to comment on something. Sometimes when the consultant does not want to, for example, take responsibility for a decision, they would tell us to write their medical decision through our system (residents etc) so when*

*something goes wrong, they do not take the responsibility for it, and it will look like our decision” (H2P1).*

Another sub-theme reported by physicians and nurses is ***fear of the EHR impact on their self-perception***, which is related to how they can easily be mistaken while recording, and the system does not give them the chance to correct their mistakes. For example, H1P9’s statement detailed how the EHR system can make them easily make mistakes, and the problem is that they cannot fix or change these mistakes:

*“I do not think it is good for its quality; you might do mistakes very easily, which is the opposite of the why the system has been implemented in the first place, which is to reduce mistakes!!!”*

This has been reinforced by H1P6 when they said: *“No, defiantly not! It is completely unreliable. We have a lot of mistakes.”* Most physicians in H1 have expressed a similar problem, which is the inability of the system to correct patient information when they write wrong diagnoses or information. This will increase medical errors and their responsibility for these medical errors because it is recorded in the system under their names, even though they have requested for them to be fixed. One of them said he had been waiting for a long time to fix his patients' information and they still have not been fixed: *“You call them, and then their support system is bad. I have two patients until now they did not correct them” (H1P7).*

Nurses also indicated how the system could alter the optimistic view about them or their professional image among their colleagues, and the outcome is that they lose face. For example, one of the nurses has explained how when making even a tiny mistake in recording information, it comes back to the nurses; even though they will try to remove or edit the wrong information simultaneously, the system does not have the flexibility to do it. H2N4 said:

*“It does actually impact. Because sometimes you put information in the system, and you will be responsible about it. For example, in my evaluation, they motioned something, it was entered in the system, so, yes it has a direct impact to me. [...] I learn from the lessons when I put information or wrong*

*something, that will direct impact me in somehow in a bad way. [...] Because usually they report the things that are bad that you have documented on the system, and this is really for sure has impact on me.”*

This can have a very damaging impact on both physicians' and nurses' professional reputations.

In addition, ***privacy concerns for their personal information*** is another reason why physicians in the same hospital are not using the system to record their own information because they are afraid that their information will be exposed if they use the hospital's EHR system. Hence, physicians do not trust the system, and some have told us they know some physician colleagues being treated in another hospital, so their colleagues cannot access their information. For example, H2P8 advised that:

*“She is an employee here, and she go to the Military hospital because she does not want her colleagues to know she has a mental health problem. That is why she went to be treated in another hospital. Because she does not want this mentioned in her record at the hospital.”*

### **5.3 How can the Use of EHR Influence the Relationship between Patients and Healthcare Professionals in Saudi Arabia?**

This is the third question in our research. Two themes emerged (Table 5.3), and many sub-themes have been generated. This third question (5.3) is an answer to many calls to deeply understand the impact of EHR on users, such as the relationship between the nurses and physicians with their patients, due to the lack of studies in this area (Bardhan & Thouin, 2013; Morgan, 2016). Hence, in this section, we asked physicians and nurses how the system changed the relationship between them and their patients. They both have attributed the change in the relationship to be caused by the EHR system.

Major Themes	Sub-Themes
Healthcare professionals cannot improve communication with the patient by using EHR	(P)
	<ul style="list-style-type: none"> <li>• Depending on the system more than what the patient is saying</li> </ul>
	(N)
	<ul style="list-style-type: none"> <li>• EHR system caused a communication gap between physicians and patient</li> <li>• EHR limits the time that patient can have with his physician</li> </ul>
Patient Satisfaction	(N)
	<ul style="list-style-type: none"> <li>• Satisfying the EHR system over the patient</li> <li>• Compassionate care affected</li> </ul>
	(P) & (N)
	<ul style="list-style-type: none"> <li>• Less satisfaction among patient</li> </ul>

*Table 5. 3 RQ3 Emerged themes and sub-themes.*

### 5.3.1 Healthcare Professionals Cannot Improve Communication with the Patient by using EHR

The first theme in this section is that **healthcare professionals cannot improve communication with the patient by using EHR**. This theme refers to how physicians' and nurses' time communicating directly with their patients is reduced due to their time being taken up with the EHR system. Several sub-themes have been identified within this theme, such as *physicians now are more dependent on the system than on what the patient is saying* which has been reported by physician participants. Further, nurses reported *the EHR system caused a communication gap between the physician and their patients* and that *the EHR limited the time that the patient has with their physician*. The next paragraph will discuss these themes.

The first sub-theme, *that physicians spend more time on the system than on what the patient is saying*, has been highlighted and reported by many physicians. This means that physicians listen less to what the patient says about themselves or how they feel; they only rely on what is on the screen, despite some saying the screen is not the right indicator of the patient's physical condition. The system made physicians have less direct



interaction with their patients, and they only saw how they were doing by seeing their vital signs on the system. Consider what H2P8 said:

*“We rely on the system to see how the patient is doing vitally. We would see their vitals and their blood pressure [...] according to that we judge that the patient is stable. However, there is always a clinical perception, you still should and have to go and ask the patient how they are, because their vital does not reflect their feeling [...]. But sometimes we would look at numbers and judge to a patient according to numbers, which is not very correct. You should see the patient themselves and ask him how he feels, rather than treat them according to their x-ray or lab, or what the system says.”*

This feeling has been shared by other physicians, as some have confirmed that they are now neglecting the actual physical condition of the patient and only believe what the system says. They are now ignoring their professional sense, professional skills and professional training, which took them years to develop and they now depend on the EHR system. H2P4 said:

*“I feel we are being neglecting or overlooking a certain thing from a humanitarian perspective because now we are system-based, and numbers do not lie - it is right there in front of you. Sometimes the patients have their opinion or something to say, they do not want you to look at the computer or numbers, which can be a bit challenging.”*

This was also confirmed by H2P7 when he expressed his sadness over the number of actual patients he had seen during the day of the interview:

*“Yes, become less. We do not go to them that much. From this morning, I have seen only one; we do not see them a lot, I see them only on computers and check their status on computers; that is it.”*

Hence, this has developed a shared feeling among physicians that now they are not practising what they have been taught to practise or are not practising their profession.

H2P6 said: *“I feel like we are practising medicine more in front of the screen instead of the patient now.”*

One of the participants has expressed how he sometimes forgets that he has a patient in front of him because he is too busy looking at the information or writing information on the system. H2P4 said: *“I feel I am looking at his information and too busy what happened to you and take my time to open the system, and sometimes I forget that the patient is in front of me.”*

Furthermore, when it comes to nurses, during the interviews, one of them explicitly reported that the ***EHR system caused a communication gap between physicians and patients*** and ***limited the time that patients can have with their physicians***. Some patients have also reported to the nurses that they do not see their physicians daily as they should during morning rounds. For example, H2N5 explained how the EHR system caused this problem: *“Like, yes, between patient and physicians, yes, there are some gaps, for example, to be honest in terms of communication.”*

### **5.3.2 Patient Satisfaction**

**Patient satisfaction** is the second theme and, in this study, refers to patients’ response to their experience regarding their communication and clinical care service with/from healthcare professionals. This theme could be seen as the result of the EHR implementation and how it has interfered with the relationship between the patient and the healthcare professional, causing less communication between the two. Many sub-themes were identified, such as ***what nurses reported, how they are forced to satisfy the EHR system over their patients***, and ***their compassionate care being affected***. Further, physicians and nurses reported that this has resulted in reduced patient satisfaction.

To illustrate, nurses reported, when asked, how they were forced to ignore their patients to satisfy the EHR system, which is not what nurses have been trained to do. H2N4 explained:

*“Actually, I think in a bad way, to be honest. Because we are supposed to stay with the patient long time to take the information, but now we have to satisfy the system [...]. Just to make that clear to the system that everything has been done. But lately discovered we are having few minutes with our patients.”*

Additionally, H2N1 had a seminal view of the problem and included that this resulted in growing frustration from their patient. H2N1 said:

*“Your patient will be frustrated that you are doing some in the system related to the other patient because you have different patients, you don't have only one patient, and I haven't finished from that patient, you still continuing on the system, and that patient he needs something, so the patient gets frustrated. And you cannot explain to them, like, sorry, I am doing something on the system, they want his things first.”*

This has been confirmed by H1N1 who explained how this problem had caused damage to the relationship between the healthcare professional and their patient: *“It is difficult with the patients to communicate with the physician. So, I think the system put a strain on the relationship. [...] Yes, it has a negative impact.”*

Here, the participants explained how they are now forced to satisfy the system and ignore their patients and how this caused damage to the relationship between the patient and healthcare professionals. Furthermore, we have also noticed another sub-theme identified and expressed by nurses only, which is that ***their compassionate care is being affected***. For example, H2N3 said:

*“Nurse is providing that therapy care as well as the medical care; it is not just about the medical care, you know? What about the psychological care, and do you have time for that? I do not think we do, because we have much time invested in our documentation in the system.”*

This shows how nurses may care more about compassionate care than physicians do. However, the outcome of this reduced sensibility of patients' needs has resulted in reduced satisfaction among patients, a sub-theme expressed by both types of healthcare

professional (physicians and nurses). Many physicians and nurse participants expressed how the system takes them away from the patient, changing their interaction style and limiting their time with their patients. For example, H2P4 explained this feeling: *“In a certain way, yes, because I have been in a patient position and a doctor position, so yes, we usually around our computers.”*

H2P6 confirmed this statement and further elaborated with an example:

*“We spend way more time in front of the screen finishing up plans for the patient, which gives you a limited time to actually interact with your patient and see them and talk to them. The same goes for the clinics, for example, you have a document that you have to fill in every clinic visit. The orders you have to put in, and you only have a limited amount of time with the patient, so you are under a pressure in a clinic visit in front of the screen and not being able to talk to the patient, so, yeah, I think it has limited patient-physician interaction.”*

Physicians have supported this data in H1, and nurses feel the same way regarding how the system limited the interaction with and satisfaction of their patients. To illustrate, H1P1 highlighted how he sees his patient being annoyed at having to wait for him during the consultation time when he works at the computer: *“Some patients are annoyed of waiting, and the physicians are dealing with computers and the system.”* Their colleague then elaborated and explained how this affects patient-physician communication. H1P2 said: *“You do not really do a good job with the patient; you do not communicate with the patient.”*

Some physician participants blamed the system for this, as they believe now the patient does not need physicians because they have what they need from an application called Sihaty, which has been developed by the MoH in Saudi Arabia. H2P5 said:

*“In this hospital, we have an application that is called Sihaty, which will give the patient the ability to access his file [...]. So, it is less likely for your patient to come and ask you have you seen the results because it is already in his hand.”*

## 5.4 Chapter Summary

### 5.4.1 Summarising the Emergent Cultural and Religious Factors

Our findings from the above research questions highlighted an interesting outcome of our in-depth interviews. This is the emergence of the cultural and religious aspects of healthcare professionals in Saudi Arabia, and how they can influence their professional identity, guide their behaviour to resist the system, and finally, influence their work outcome. To illustrate, in RQ1, we have noticed that EHR use influences their work as a healthcare professional, which might trigger their religious beliefs to perfect their job as a Muslim healthcare professional and could be referred to as *Itqan* identity.

Further, we have noticed the role shift between physicians and nurses, which could be unfavourable among Saudi physicians. To elaborate, physicians felt that the EHR system is restructuring their role as healthcare professionals and limiting their influence over nurses. This could imply that they are not comfortable with this outcome, as their social status is highly tied to their professional role.

In addition, RQ2 showed us many cultural and religious behaviour which could be used to resist the system. For example, healthcare professionals stated that they are purposefully writing wrong information about the patient's situation could be understood from both cultural and religious perspectives. To illustrate, three not recording the HIV information could be related to religious reasons, while not recording mental health issues would be related to cultural and social factors.

Finally, cultural factors also emerged from the in-depth interviews in RQ3 as healthcare professionals are troubled when the system is taking much of their attention, which should be directed to their patients. This could be seen as a cultural perspective, as Arabic culture is a direct interaction culture, in which patients prefer to spend their time with healthcare professionals directly interacting with them. Additionally, nurses specifically mentioned an interesting factor in how the EHR system took away their compassionate care as a nurse. This has been seen culturally as Saudi society is a collectivist, and they used to take care of each other's and show their interest and care of them, which the EHR system prevented nurses from presenting.

## 5.4.2 Conclusion

This chapter presented our in-depth interview data from 42 participants (physicians and nurses). Through thematic coding analysis following Clark and Braun's (2006) approach, we have identified multiple themes for each question. We noted that even though each healthcare professional has a professional identity, physicians and nurses have different meanings for their professional identity and how they practise it. To illustrate, we have noticed for example that physicians value their medical skills, while nurses value their compassion and consider it vital in order for them to be healthcare professionals. Further cultural and religious factors have also emerged, and themes and sub-themes surfaced which were not identified in the previous literature, such as compassion. Reputation, and how conflict within their multiple identities (e.g., cultural/religion vs professional) could lead to resistance behaviour. The following chapter will contain a detailed discussion which links those themes to professional identity along with Hofstede's theory, and finally to the previous literature.

## Chapter 6

### Theorisation and Discussion

This chapter will interpret the findings in the previous chapter with respect to professional identity theory and their real-world implications, along with positioning our findings in the current literature to answer our research questions. We utilise professional identity theory as the basis to analyse and situate our findings because it provides a robust tool with which to explain individuals' behaviour (Burford, 2012); in this case, healthcare professionals, specifically physicians and nurses.

As mentioned earlier, we aim to understand why/how the professional identity of healthcare professionals, in a context such as Saudi Arabia, can explain resistance behaviour towards the EHR system. This chapter will be structured as follows: first, theorisation and discussion for the first Research Question; second, theorisation and discussion for the second Research Question; then finally, theorisation and discussion for the third Research Question.

#### **6.1 How does the Use of EHR Influence Healthcare Professionals' Identity in Saudi Arabian Public Hospitals?**

This section focuses on RQ1, which is *How does the use of EHR influence healthcare professionals' identity in Saudi Arabian public hospitals*. Table 6.1 defines the sub-questions and the Research Objectives that have been achieved through answering RQ1. The study has answered RQ1 and achieved RO1 and 2 by explaining and confirming that the use of EHR considerably influenced healthcare professionals' identity in different ways, some positive but mostly negative, as reported by participants. Both participant groups have explained how and why EHR use influences their professional identity, and (Figure 6.1) explains how the EHR influenced professional identity. It starts with the "EHR use leads to" box. Then, it shows another four boxes (a, b, c & d) representing the changes in professional identity caused by the EHR system. After that, nine boxes show an example of those changes and end with the (e & f) boxes, which explain healthcare professionals feeling about the EHR influence.

Sub-question(s)	Research objective(s)
SQ1-1 How and in what ways does the EHR system influence healthcare professionals' work in Saudi Arabia?	RO 1-1 To understand the influence of the EHR system used on Saudi healthcare professionals' identity, how they feel about it, and whether it has an impact on their work as a professional.
SQ1-2 What are the changes EHR causes to the Saudi healthcare professionals' identity?	RO 1-2 Understanding the differences between physicians and nurses' professional identity, and their rationale to resist the EHR.

**Table 6. 1** Sub-questions and Research Objectives Related to RQ1.

Further, it has been suggested that healthcare professionals' behaviour changes in healthcare organisations, especially regarding technology, must be addressed (Carroll & Quijada, 2004). Due to the limited research focused on investigating the influence of technologies on healthcare professionals' identity (Lapointe & Beaudry, 2014; Chen *et al.*, 2021) and professionals' work outcomes (Tomer *et al.*, 2022), this study has built upon the academic body of knowledge by investigating how the EHR influenced the Saudi healthcare professionals' identity. Interesting contextual insights have emerged, and here we will highlight and explain those emergent insights of how the use of EHR influences the healthcare professionals' identity in Saudi Arabia.

We have evidenced the presence of the EHR influence on the healthcare professionals' identity (physicians & nurses) by addressing the following concepts: 1) changes in healthcare professionals' work outcomes, 2) how this affects their professional values, 3) the restructuring of healthcare professionals' historic role, and 4) professional uncertainty. The next section will discuss the above concepts.



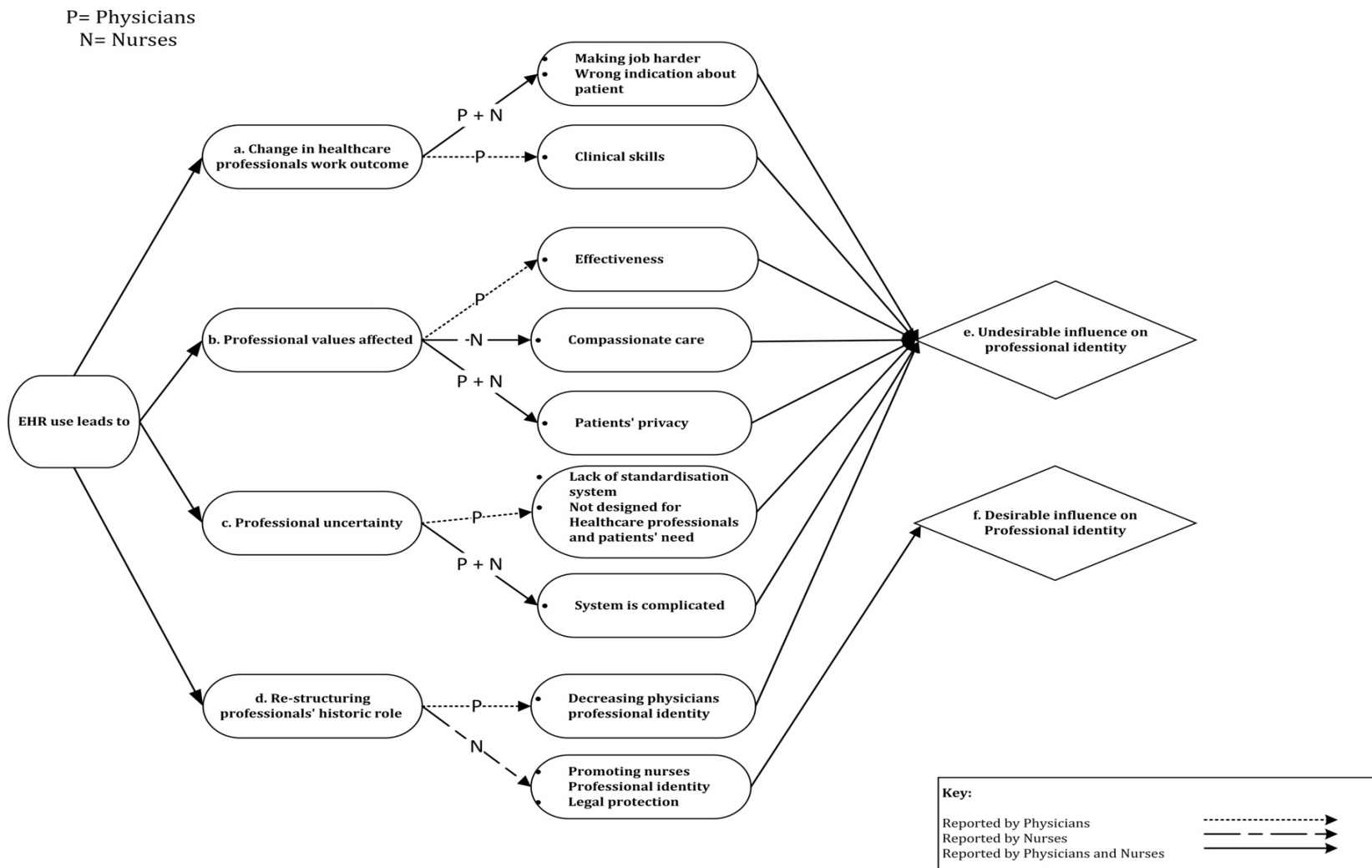


Figure 6. 1 Diagram presenting how EHR use system influences healthcare professionals' identity.

### 6.1.1 EHR Systems' Influence on Healthcare Professionals' Work Outcome

Change could be seen as striking at the very heart of a professional identity, especially when that professional identity is deeply embedded in the individual's identity, such as in a physician or a nurse. To illustrate, physicians' professional identity, for example, is more potent than their organisational identity (Van Os *et al.*, 2013). However, change is not acceptable in countries with a high UA characteristic, such as Saudi society (Cassell & Blake, 2012), because their culture and religious roots are more important than their organisations'. Hence, that could indicate their motivation not to follow hospitals' policies, which is what we have seen.

This emergent theme (6.1.1) refers to the influence and the change of healthcare professionals' work outcomes due to the use of EHR. This use has influenced the outcome of their patient's care, which is a central part of their professional work. This change is seen as threatening because professionals' identity for Saudi Arabian healthcare professionals is not only influenced by their self-perception as healthcare professionals, but also by how they see themselves as Saudi healthcare professionals.

Therefore, Saudi society drives and influences the Saudi healthcare professionals' identity. Hence, it has been argued that the professional identity of healthcare professionals is not static but can evolve through social and relational factors (Bridges, 2018). To illustrate, physicians expressed how the EHR system affected their work by ***making their job more complicated*** due to many factors discussed earlier (Findings Chapter).

Therefore, when Saudi physicians perceive the system as something that will hinder their ability to execute their job as healthcare professionals. This will affect their self-perception, resulting in low performance and outcomes (Johnson *et al.*, 2012). Thus, Saudi physicians will protect and maintain their high performance because of their awareness of its importance to their social status. Further, it is essential because healthcare professionals view their autonomy and decision-making independence as a core part of their role (Abouzahra, 2014). Hence, any threat to what they believe in will be met with resistance

(Hsieh, 2015). To illustrate, Saudi physicians expect their professional and social status to guarantee them a high level of independence at work; hence, anything negatively impacting this perception will be resisted.

In addition, nurses have confirmed the lack of information for their patients through the **unavailability of hard copies of patients' information**. This caused nurses to express how the EHR system is not supporting them professionally and that they will resist using the EHR system because of the negative influence on their profession. A positive and flexible professional identity is critical for nurses to perform well as it benefits not only the nurses but also their patients and other healthcare workers (Johnson *et al.*, 2012; Frechette *et al.*, 2020).

This is important, particularly for Saudi nurses: this is due to the poor perception of nurses' image in Saudi society, which resulted in their need to improve their public image in society through improving performance to support their professional identity. Hence, we could say that nurses' perceptions about their competencies and professional selves are crucial to their performance, as the feeling of inadequacy and incompetence harms their professional identity (Johnson *et al.*, 2012).

However, due to the above challenges, a new problem arises and reflects on healthcare professionals' **clinical skills being affected**, which only physicians have reported. These challenges prevented physicians from doing their work at their best capacity. For example, physicians expressed how spending most of their valuable time as a healthcare professionals on the EHR system decreased their clinical skills and made them feel they are no longer practising medicine. This triggered a threat to their professional identity and caused them to resist the EHR as it would affect their work outcome.

Saudi Arabian physicians work hard to successfully establish and maintain a unique and essential professional identity through a lengthy education compared to other disciplines in Saudi Arabia. Medical education in Saudi Arabia contains six years of education and one year of medical practice, which is a total of seven years (Al-Shafei *et al.*, 2019). Further, the

medical practice year is critical and very competitive in Saudi Arabia, as medical students must achieve their best academic performance to try to get accepted to be trained at any hospital in Saudi Arabia before graduation.

Additionally, during their practical training, they must present their best clinical practice in order to be able to continue in their chosen field after graduation, as this is another competitive stage. Thus, physicians see their clinical skills as what makes them unique in the eye of themselves, their patients, society, their employment, and, more importantly, what makes them professionals. Consequently, their healthcare professional identity is critical to their sense of self, and connects them with their “roles, responsibilities, values and ethical standards unique to a specific profession” (Goltz & Smith, 2014, p. 1).

Another sub-theme that emerged from the data interpretation could be linked to how physicians’ clinical skills are affected by the EHR system, which is that the EHR system gives ***a wrong indication about patients’ conditions***. This issue could be life-threatening to the patient and eventually may lead to medical errors, as indicated by some physicians. Therefore, participants expressed how the system is showing them wrong indications about the patient's health situation and how the EHR system has been forced upon them to be the only source of information regarding their patient. This resulted in physicians depending entirely on the EHR system to see how their patients were doing, which is wrong according to the interviewees.

However, this wrong indication about patients’ conditions caused another sub-theme to emerge, which is ***medical judgment can be affected***, and refers to how the management plan for their patients has been negatively affected because of the EHR system. The data shows that physicians and nurses are dissatisfied with how the system affects their daily work routine and patient care. Hence, the EHR system is badly influencing Saudi Arabian healthcare professionals' identity, mainly when the lack of information and the outcome of it affects their work. This will result in them protecting their professional identity as they tend to when they face such challenges (Abbott, 2014) and protecting their patients’ best interests (Abouzahra, 2014; Walter & Lopez, 2008).

In addition, nurses specifically raised the issue of not having previous information about their ill patients. This could result in wrong judgments about their patient's treatment plans and could lead to medical errors, which several nurses have expressed. Therefore, this can badly influence nurses' work and negatively influence their professional identity because ensuring safe care is a fundamental value and ethical responsibility of the nursing profession (Hensel, 2014).

Further, H2N3 expressed how she disagrees with and is not happy about the medical assessment that has been recorded in the EHR system because it is not a reliable assessment, or how the system is preventing nurses from taking actions to save a patient's life because it shows that the patient is in a stable condition. This is important and could endanger the patient's life because it will not allow healthcare professionals to make any request if the system has its own conclusion, which H2N3 expressed.

Nurses' professional identity encourages them to provide quality care and engage others for the same purpose (Frechette *et al.*, 2020). This is because the perception of their competencies and professional selves is critical for a positive performance (Johnson *et al.*, 2012), as inadequacy and feelings of incompetence negatively impact nurses' professional identity (Prato *et al.*, 2011). Thus, healthcare professionals perceive errors as a threat to their identity because errors are incongruent with their professional ideals (Dixon-Woods *et al.*, 2009).

Taken as a group, this theme could be explained within the Saudi Arabian culture because the cultural background can be a decisive element in the concept of professional identity (Al-Rumayyan *et al.*, 2017). In Saudi Arabia, it is essential for individuals to do their best at work, not only because a supervisor is watching them or because their job requires them to do it, but rather to reinforce their own *Itqan professional identity*. *Itqan* in this research means a Muslim's mentality to perform their best work and continue to improve themselves at their job.

Hence, when the EHR does not help healthcare professionals deliver their best clinical outcome to their patients, it will affect not only their professional practice but also their

religious belief that they should perform their best in their work as they are waiting for the reward from God himself, their *Itqan*. This is because Muslims are instructed by the Islamic religion to do their best to follow God's order in trying to perfect what they are doing.

Hence, Muslim healthcare professionals follow the Hadith<sup>22</sup>, as the Hadith says: "Allah prefers when someone performs his work to do it perfectly" (Mirakhor *et al.*, 2020). This means that God prefers when someone is performing his job, that he should try not only to do it but also to perfect it. This is because Islamic values are built on the foundation of faith, providing Muslims with a code of behaviour and ethical and social values (Sabry & Vohra, 2013). Thus, as discussed in Chapter 3, the culture of Saudi Arabia has been mainly influenced by the Islamic religion, which Muslims see as a religion and a way of life (Atan & Arif, 2017). Therefore, these religious beliefs and instructions guide their behaviour and are part of their professional identity as Muslim healthcare professionals.

To conclude, this analysis found and proved how the EHR system has negatively influenced physicians' and nurses' professional identity by influencing their performance and work outcome, hence impacting their professional identity as healthcare professionals. Our work contradicts the previous work of Chen *et al.* (2021) and Villalba-Mora *et al.* (2015), as the first study result concluded that the use of EHR improved and even empowered their self-perception, but our study found the opposite while the latter, which was done in Spain, concluded that the EHR influenced healthcare professionals (physicians in particular) positively, as they believed it could help them do their job better, which would give them a better view of the patient's situation, resulting in a better-informed medical judgment. In addition, the outcome of our study is contrary to previous studies (Pluye *et al.*, 2004; Kazandjian & Lipitz-Synderman, 2011; McCullough *et al.*, 2016; Bawac & Kamdjoug, 2018) which have suggested that the use of EHR has a positive impact on healthcare professionals' practise and improved their work outcome including making medical decisions.

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<sup>22</sup> Hadith, as explained in the context chapter, is the saying of Prophet Muhammed Peace Be Upon Him (return to Chapter 3 for more information).

### 6.1.2 Healthcare Professionals' Values are Negatively Affected

We have noted that **healthcare professionals' values are negatively affected** by the wrong judgment that causes medical errors. Professional values are “a basic conviction of what individuals or social groups consider right” (Moyo *et al.*, 2016), and it influences how individuals behave and guide their evaluation of choices and actions (Schwartz, 1992). Therefore, values are essential for professionals because patient safety and care are a fundamental values and ethical responsibilities for healthcare professionals (Hensel, 2014), especially Saudi Arabian healthcare professionals.

Physicians have reported that they believe the EHR system has damaged their *effectiveness* during their work, which is one of their values as Muslim healthcare professionals, and it could also be linked to what we have discussed in section (6.1.1) (*Itqan*). Therefore, Saudi physicians perceived the EHR system as threatening their Islamic value of *Itqan*, which is to do their best at work. As we will see later in RQ2, this will result in resistance behaviour.

Furthermore, unlike physicians, nurses reported that the EHR system had influenced their professional identity by taking away their ***commitment to treating their patients with compassionate care***. Hence, this resulted in the *lack of compassionate care* that the EHR system caused. Compassion is the occurrence of a feeling that arises when seeing another's distress which motivates a personal desire to help (Sinclair *et al.*, 2017).

Unlike physicians, nurses consider compassion as an essential component of their nursing care (Dietze & Orb, 2000) and the use of the EHR system has affected this kind of interaction by making nurses too busy with documenting information on the EHR system and having less communication time with their patients. For example, one nurse expressed that most of her time is dedicated to the EHR system instead of to patients. This influenced one of the main components of a nurse's professional values as a caregiver. Nurses are seen as the holders of the value of compassion (Dietze & Orb, 2000; Beck, 1991) and patients expect nurses to provide not only medical care but also professional, compassionate care (Orb & Davey, 1994).

However, in Saudi Arabia, this might be because most nurses are females (which we have also seen during our interviews with only three nurses being male) as females are considered more compassionate than males. This is backed by a study conducted among Saudi Arabian female nurses who indicated that they are motivated to pursue a career in nursing because of their desire to help people (Alboliteeh *et al.*, 2017). Hence, in Saudi Arabia, female nurses form 80% of the nursing workforce overall, and notably, 62% of Saudi Arabian nurses are female (Alluhidan *et al.*, 2020) and it is considered a female profession in Saudi Arabia (Banakhar *et al.*, 2021; Alsadaan *al.*, 2021). Thus, this reflected the emergent compassion theme and the importance of compassionate care in treatment, in which compassion and empathy are qualities not only of nurses as females but also within Saudi society.

Therefore, it has been emphasised that compassion is one of the main characteristics that nurses are expected to have (Dietze & Orb, 2000) as, during the process of developing their professional identity nurses will have a great sense of commitment to their work and their profession of nursing (Gregg & Magilvy, 2001). This is particularly true for Saudis, as it is considered a feminine society (Bjerke & Al-Meer, 1993) which reflects on nurses' values of caring and concern for their patients, hence, the importance of this type of care. In addition, providing compassionate care for the patient can enhance the lives of nurses, both personally and professionally (Smart *et al.*, 2014). Furthermore, Saudis view nursing as women's work (Alsadaan *et al.*, 2021); thus, what is expected from nurses, such as compassionate care, might not be expected from physicians.

For that reason, one of the significant differences between nurses and physicians is evident in our data. This is because a nurse as a professional believes that it is one of their moral duties to provide patients with compassionate care, and it is seen as the foundation of their professional nursing (Dietze & Orb, 2000). In addition, compassionate care is expected by patients, and it is a professional obligation of clinicians and is considered to be one of the ethical codes for professionals (Sinclair *et al.*, 2017). Therefore, compassion is one of the differences that impacts nurses' decisions to use the system and how they look at their



professional identity, as it is one of the factors in their decision-making process regarding using the EHR system.

***Patients' privacy has been violated***, reported by both physicians and nurses. Patients' information is important and should be kept confidential according to the participants. Hence, according to the interviews, the physicians think that protecting patients' information is one of the values a professional should adhere to. Further, this could be related to the Saudi context and culture, as many studies have highlighted culture's impact on online privacy (Rashidi *et al.*, 2016). Also, the Islamic culture grants a person the right to personal privacy; as in the Quran (Muslims' holy book) privacy is first mentioned in the context of instructing people to seek permission before entering another's home, which gives the symbolic meaning to Muslims that you are not allowed to violate other's privacy without permission (Abokhodair & Vieweg, 2016).

In addition, Saudi Arabia upholds the right to privacy in its fundamental Law of governance, which is taken from the Islamic religion (Abokhodair & Vieweg, 2016) and is the most crucial factor that influences the Saudi culture and law (Kwong & Levitt, 2009). Hence, the Islamic faith greatly influences decision-making, health practice and the use of healthcare (Attum *et al.*, 2018). This was supported by H2P8 when they confirmed that the importance of privacy is related to cultural factors in Saudi Arabia.

Physicians and nurses have also expressed how their ***patient satisfaction is affected*** because of the EHR system. For instance, H1P7 expressed how their work with the EHR system gives the patient the impression that healthcare professionals do not care about them or are not interested in helping them, resulting in lower patient satisfaction. This could be seen as an unwanted impression by healthcare professionals because it is against their understanding of *Itqan* as Muslim healthcare professionals.

Therefore, both types of healthcare professional have reported that because of the use of the EHR system, time with the patients, who should be their top priority, has been decreased, and this reflects in their point of view that they have not done their job in the best way they

should have. Further, one of healthcare professionals' values, especially in Saudi Arabia, is to provide quality care for their patient, hence, their satisfaction with the treatment a patient is given or how they are dealing with their patient is an indication and reflection of how they perfected (*Itqan*) their work.

Our results indicated that healthcare professionals values had been influenced by their use of the EHR system, such as when it comes to patients' privacy and, interestingly, compassionate care from the nurses' perspective. Healthcare professionals believe that one of their values (Hedström *et al.*, 2011) as a healthcare professional is to protect their patient's best interests, and their private information is one of these values. However, the potential negative influence of leaked information is challenging to grasp and anticipate and could cause the end-user to be concerned (Haag *et al.*, 2021).

As discussed earlier, participants have expressed their concerns about how patients' information is not safe, and this could be justifiable, as previous research suggested that an insider in the organisation causes most information security breaches (Hedström *et al.*, 2011). Hence, the staff have been the number one threat to this information (Hedström *et al.*, 2011). However, this study result has been partly supported by Nilsson *et al.* (2018), as their study aimed to understand how the professional values of the healthcare professionals (physicians and nurses) guide their use of the EHR. Their study concludes that there is a need to satisfy professional values, yet they have not specified which values need to be fulfilled. Moreover, many studies have contributed to the subject of privacy in EHR literature (Anderson & Agarwal, 2011; Angst & Agarwal, 2009; Samsuri & Ismail, 2013) yet these studies have not considered the contextual difference, as privacy concerns can vary between individuals and healthcare professionals' staff.

In addition, what kind of privacy do we mean? What kind of information could be considered private? This study highlights how information privacy is vital in Saudi Arabia and to what extent healthcare professionals could go to protect this information. Our study has found that there are three levels of information in Saudi Arabia, which will be discussed in detail in the second question (Figure 6.4). For example, Anderson and Agarwal (2011) highlighted

that information has different levels (however, they have not specified what those levels are) and the patient is unaware of this. Therefore, they are willing to provide access to that information, which contradicts our study. Further, they highlighted that people with negative emotions about their current healthcare status are more open to disclosing their information to the EHR. In our findings, people in Saudi Arabia with the Human Immunodeficiency Virus (HIV) or alcoholism could have negative emotions regarding their current healthcare status, yet, they are not allowing this information to be recorded, so physicians, therefore, will not record the information.

Another study by Angst and Agarwal (2009) sought to explore whether proper education would make people less concerned about their information privacy in the EHR. Their result suggested that it increases the chance of using EHR; however, our study contradicts their findings. Our findings show that healthcare professionals, as educated professionals with the best knowledge about the importance of recording patient information, are still resisting the system due to cultural barriers.

In addition, Samsuri and Ismail (2013) found in Malaysia that healthcare professionals are open to sharing healthcare information with their relatives. Further, they concluded that since Malaysia is considered a high-power distance and collectivist culture, they trust the government with their medical information. However, this does not align with our study, as the Saudis still do not want to share their information, and they are a high-power distance and collectivist culture, yet they still do not trust the government hospital to have their information.

### **6.1.3 The System is Restructuring Professionals' Historic Role**

**EHR systems are restructuring healthcare professionals' historical role** which has been noticed during our data analysis and refers to how the system is changing healthcare professionals' roles either positively or negatively. For instance, historically, nurses in countries such as Saudi Arabia seen by themselves and the society as an assistant to physicians (Hojat *et al.*, 2003; Alsadaan *et al.*, 2021). Hence, the implementation of the EHR

system has been seen to be a significant role changer to both nurses and physicians. Here, according to our data, we confirm how the system has the potential to positively enhance nurses' professional identity while negatively influencing the physicians' professional identity.

To illustrate, data shows us that using the EHR influences their professional identity by **provoking an ambivalent identity**. Ambivalent identity can be understood to be how healthcare professionals find one aspect of EHR embedded in their professional identity and another contradicting or conflicting with their professional identity (Kreiner & Ashforth, 2004). Both types of participants informed us about the changes, and we have noticed that some are happy with them, while some are not.

For instance, from what some nurse participants tell us, we think the **system promotes their nurses' professional identity**, especially in front of their physician colleagues. An example of this is authority in terms of refusing to fill physicians' patient records instead of them, with an excuse of patient privacy (e.g., H1N1 & H1N3). In addition, one of the participants has also expressed how she is happy that they do not have to follow physicians' requests and order medication. Instead, because of the system, medication orders now must be from the physicians' account; hence, they are now ordering medication throughout the system by themselves, which they used to request nurses do. However, as we will see later, the medication request privilege only applies to consultant physicians.

Nurses' professional identity in Saudi Arabia is seen as being handmaids for physicians, and physicians in Saudi Arabia hold a negative image of nurses (Alsadaan *et al.*, 2021). Hence, Saudi Arabian nurses have this view about themselves and how they are considered less important and prestigious than physicians before the EHR system. To explain, Saudi Arabian nurses receive lower wages than physicians and other jobs and still do not have a salary ladder<sup>23</sup>. Nurses' monthly salary is around 10,000 Saudi Riyal (US\$2,700).

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<sup>23</sup> The Salary Ladder in Saudi Arabia is an official document which states the monthly salary of each job category.

In addition, nurses in Saudi Arabia suffer from a lack of professional growth, along with a lack of support for nurses who are working mothers (Alsadaan *et al.*, 2021). All these aspects shaped and affected nurses' professional identity and their image from the point of view of patients, healthcare professionals and themselves. However, now with the EHR system in place, their professional identity is influenced by their collective character being promoted and not having to submit to physicians, which provoked the ambivalent identity of nurses in Saudi Arabia.

In addition, according to what the nurses say, we have noticed that the EHR system promotes their professional identity as a nurse by ***legally protecting them*** from uncooperative physicians. This can be seen as a significant change in the relationship between physicians and nurses, as it now can set a limit on what physicians can and cannot ignore when a nurse requests something for the physician's patient. Technological change plays a significant role in how nurses interact with their patients and other healthcare professionals, such as physicians (Johnson *et al.*, 2012). Hence, this has been seen as a change in their role by promoting their professional identity and allowing them to choose not to submit to physicians or be under physicians' control.

Therefore, as shown in the Findings chapter, the nurses are partly happy about the system despite its limitations. This is due to the benefits their professional role is getting; in other words, the system promoting their professional identity as a nurse. Thus, the nurses have perceived the system as a positive power for their professional identity as nurses. This is because historically, the relationship between physicians and nurses tended to be hierarchical, where the physician has the upper hand, especially in a society where nurses have little autonomy while physicians have total dominance over the patient care decisions (Hojat *et al.*, 2003) such as it is in Saudi Arabia (Al-Eraky *et al.*, 2014). Lack of autonomy has often been highlighted during our interviews with nurses (see Findings chapter). Yet, despite how they see the system as promoting their professional identity, their cultural and religious identity, as we will see later, is still a significant factor for them to resist the system.

However, some nurses have also felt that the EHR system has made them less important, despite their positive feelings about their professional identity promotion in our above discussion. As mentioned, ambivalent identity has been provoked and influenced by the EHR system use, and the outcome is Saudi healthcare professionals comparing their gains with their losses. In addition, nurses have expressed their dissatisfaction with the EHR system; this has been interpreted as nurses being *treated differently to physicians* because the EHR system has imposed a new approach to dealing with nurses.

For instance, different treatments in terms of *reduced access to patient information makes nurses more dependent on physicians, being audited based on their usage of the system, and being asked to check their system hourly*. Nurses in both hospitals expressed dissatisfaction with how the system is imposing a new norm. This new norm, in their view, is that they are being treated differently, which in this study refers to how the system makes particular healthcare professional feels less important than others. Perceiving a professional role, especially as a healthcare professional, either positively or negatively, will essentially influence their ability to provide safer quality care for their patient (Smart *et al.*, 2014; Halbseleben *et al.*, 2008).

Furthermore, individuals in organisations perceive their importance depending on their contribution to the organisation (Oen & Cooper, 1988). Hence, when nurses feel that the system is limiting their role or reducing their contribution to their patients, it will affect their self-perception, which led them, as it has been found in this study, to resist the EHR system. A handful of physicians have also expressed their abilities have been limited, for example, regarding access to their patients' information; however, we have noticed that this problem is seen more in nurses as all of them highlighted this problem. Lack of access to the system and patients' information strongly impacts their role and, consequently, their professional identity.

Therefore, as explained earlier, one of the fundamental aspects of nurses' professional identity is providing high-quality care for their patients (Frechette *et al.*, 2020). A good perspective on their role is critical to their sense of performance and achievement (Johnson

*et al.*, 2012). Hence, their belief in providing high-quality care to the patient is one of the most critical components of their professional identity (Fagermoen, 1997).

Therefore, if providing high-quality care for their patients is threatened, this might lead them to resist the EHR system to show their dissatisfaction with the new process that the EHR imposes. This is important because having a robust professional identity is the primary key that allows nurses to sustain motivation and make their work meaningful when dealing with challenges (Frechette *et al.*, 2020). Hence, through this sense of dissatisfaction, their sense of their professional identity could be challenged or affected, which leads their sense of self-perception to be threatened. This is especially true of a nurse in Saudi Arabia due to the importance of improving their image as a nurse and how this could reflect in their professional identity.

However, unlike the data from physicians, all of whom have expressed how they feel about the system, this feeling comes from the fact that the EHR is diminishing their professional identity regarding their role, autonomy and reputation as a physician. As discussed earlier, physicians now feel the system is diminishing their image as a professional, or as the people at the top of the hospital hierarchy, that (in their point of view) even nurses can now disagree with them because of the EHR system.

Further, nurses have also realised this change and how the EHR system can influence the physician's professional identity, which has been seen as ***the system decreasing physicians' professional identity***. This change is because nurses now do not have the authority to do certain activities on the system (for example, as we stated above, nurses now cannot request anything for their patients without approval. Hence, from our understanding, they are using it as an excuse not to disobey what physicians are requesting); physicians must do it through the system. Therefore, as explained earlier about how physicians perceive nurses, this can strongly influence physicians' professional identity as they would be dissatisfied with the status quo. This status places nurses as independent from physicians, which might cause physicians to resist using the EHR.

Therefore, our data suggest that the EHR system further influences healthcare professionals' identity through role changes, as shown earlier, promoting nurses' professional identity and diminishing that of physicians. Our findings do not align with Alexander *et al.*'s (2017) which concluded that the nurses' use of EHR did not show any difference in their professional identity. Cresswell *et al.* (2017) also suggested that nurses are more resistant to the system than physicians, which means that they do not perceive these benefits, which is the opposite of what the nurses have told us about how the EHR system could be beneficial for their professional identity.

In addition, regarding physicians' professional identity being diminished, many studies have contributed to the literature about how physicians perceive the system and how it affects their professional identity (Mishra *et al.*, 2012; Hsieh & Lin, 2018; Walter & Lopez, 2008; Esmaeilzadeh *et al.*, 2015), or how their behaviour is strongly influenced by their identity (Ulucanlar *et al.*, 2013). Yet these studies did not specify what aspect of their professional identity has been diminished or threatened. Our findings provide this information in a Saudi Arabian context: we have found, for example, that their ability to *Itqan* their work has been reduced, resulting in threatening their ability to perfect their work.

Further evidence that the system does not enhance physicians' professional identity can be seen in our study which found that the professional autonomy of Saudi healthcare professionals has been affected. Unlike their western counterparts, their autonomy in data recording for their patient is limited due to their Muslim healthcare professional identity. This finding is inconsistent with the literature, as Al-Eraky (2014) concluded, that healthcare professionals in Saudi Arabia have more autonomy than patients in Western countries. Nevertheless, despite their respect and the influence of their Muslim physician professional identity, they resist the system and do not record patient information. This has severely impacted their decision-making, or their colleagues' decision-making and patients' management plans due to the lack of information being recorded on the system.



#### 6.1.4 Professional Uncertainty due to the Influence of the User Interface Design

Professional uncertainty has been recognised from our data as a significant change following EHR use, and in this study, it can be defined as the degree to which healthcare professionals cannot predict and perform their job due to the unavailability of the necessary tools. Professional uncertainty is caused by the user interface design of the EHR system. With the increased use of technology, especially in healthcare settings, a growing sense of uncertainty has been identified (Gerrity *et al.*, 1992).

The user interface is perceived by both types of healthcare professionals (physicians and nurses) as something that influences the way they work and results in an influence on their professional identity. In each part of the world, the end-users of healthcare applications, such as EHR, have their own cultural and personal differences that distinguish them from others (Alsswey *et al.*, 2018). Differences such as their religion, culture, habits and languages are vital to designing an application user interface that is more user-friendly for the application's success (Alsswey *et al.*, 2018).

For example, physician participants expressed frustration with the **lack of standardisation** in patients' name writing. This makes it hard for them to search for their patients' names, as Arabic names are written in a different way. The physicians have reported this problem as something that could affect how they can help their patients and provide a quick response to any emergency. Hence, it will result in an insufficient tool to use or depend on when needed, which will cause uncertainty during critical situations.

Therefore, it has been argued that culture plays an important role when it comes to the user interface and how users perceive the system from their cultural perspective (Alsswey *et al.*, 2020). The Saudi Arabian cultural perspective is that they are considered a high uncertainty avoidance society (Bjerke & Al-Meer, 1993) which explains why physicians are uncomfortable with the lack of standardisation in the EHR system and how it influences their professional identity. Hence, localising the design for particular user groups and considering

their cultural identity is essential as the diversity in individual preferences (e.g., icons, navigational information) is common within a given cultural group (Alsswey *et al.*, 2020).

Another sub-theme highlighted by physician participants is that ***the system is not designed for healthcare professionals' and patients' needs***. The participants expressed how they believe the EHR system was not designed to meet their needs as healthcare professionals, but rather for the need of the administration to have more control over physicians' work. Thus, when they perceive the system is not enhancing their identity, they will resist using the EHR because users feel more comfortable with the context that reflects their cultural values and practices (Alsswey & Al-Samarraie, 2021).

An additional interesting insight is that ***the EHR system does not consider cultural aspects and needs***, which can cause *uncertainty* in decision-making. Uncertainty is not favourable in Saudi Arabia, as it can influence how someone would act in a particular situation. For example, some have highlighted that the system does not show how many wives a male patient has; this would create uncertainty for healthcare professionals by not having a complete picture of the patient's social status or situation. Further, a lack of the availability of the patient's family tree may reduce the understanding of his medical problems. Medical histories are critical in Saudi Arabia because marriage between relatives is widespread in the Saudi culture, which causes this part of the region to have many genetic diseases (Becker *et al.*, 2001; Alenezi *et al.*, 2015; Alotaibi, 2017). Thus, providing this information is vital for an informed medical decision for the patients.

Furthermore, physicians and nurses have reported a similar concern, which is another sub-theme: ***how the EHR system is complicated and scattered***. For example, H1P2 expressed how the EHR system's information is scattered, which is not helpful for them, while H1N1 highlighted difficulties in navigating the system. Physicians and nurses here expressed their dissatisfaction with the user interface of the EHR system and how the EHR system interface is not user-friendly, does not help with their daily routine and makes their job challenging, which is the opposite of what the system promised. This could be related to cultural factors, which have a vital role in how humans interact with the system (Khaddam & Vanderdonck,

2014). Hence, the interface should be compatible with the various cultures of those who will be using it, and acceptable to their specific cultural attributes (Alsswey *et al.*, 2020).

Therefore, when Saudi healthcare professionals feel that their work is being affected by uncertainty because of the EHR system, their self-esteem might be affected negatively by feeling unable to perform their duty as healthcare professionals. This will result in low performance, which H1P8 expressed as these problems making them less efficient by 50%. According to Carter and Grover (2015), the identities people claim are an essential foundation for self-esteem. Thus, identity is a vital tool for maintaining and enhancing self-esteem (Carter *et al.*, 2017), and when healthcare workers' self-esteem is enhanced, it will reflect better on their performance as a professional (Johnson *et al.*, 2012).

Hence, this analysis confirms that the user interface has influenced the professional identity of physicians and nurses. Our findings show how the EHR design caused Saudi healthcare professionals to feel uncertain when using the system, and how it made their work difficult, negatively influencing their professional identity. This is because the user interface is essential and can influence professional identity because if it is well designed, it will help the user to do their task, while if it is not, it will be difficult for the user to accomplish their work. To illustrate, Khanum *et al.* (2012) conducted a study to examine how culture impacts how people from Arabic countries perceive website interfaces and whether it impacts their cultural values. Their study concluded that interface design has a considerable impact; however, it should be noted that their study was based on a sales website.

Another study by Alsswey *et al.* (2018) was conducted to investigate the acceptance of a mobile health application user-interface designed for elderly Arab users based on their culture. Their result concluded that elderly Arab users found the mobile health application user interface acceptable due to its culturally-based design, but their study was conducted on a different application and with different end-users. In addition, our findings are partly supported by Draus *et al.*'s (2019) results that system design influences healthcare professionals' experience while using the EHR. Nevertheless, their study has not specified what aspects of the system design could influence the users' professional identity.

## 6.2 How can a Change in Professional Identity Explain Healthcare Professionals' Resistance to the EHR System in Saudi Arabia?

Here we will focus on answering RQ2, which is *how can a change in professional identity explain healthcare professionals' resistance to the EHR system in Saudi Arabia*, with table 6.2 defining the sub-questions and research objectives. Our findings answered RQ2 and found that identity theory has the potential to explain and understand why and how healthcare professionals in Saudi Arabian public hospitals engage in resistance behaviour towards the EHR system. In addition, the study achieved the objectives of this question by identifying and understanding the challenges facing the Saudi Arabian healthcare professional's identity. These challenges influenced their professional identity represented by (Figure 6.2), which shows how professional identity explains EHR resistance via ten elements connected by the input (a) and which end with the outcome (b), while in-between the professional identity threat faced by healthcare professionals is presented. These challenges resulted in their resistance to EHR systems.

Sub-questions	Research objectives
SQ2-1 How does the Saudi Arabian context influence healthcare professionals' resistance to EHR?	RO 2-1 To understand the context of Saudi Arabia and Saudi Arabian healthcare professionals.
SQ2-2 What contextual factors could lead healthcare professionals to resist the EHR, and why?	RO 2-2 To clarify the rationale behind Saudi healthcare professionals' resistance to EHR.
SQ2-3 What process do the healthcare professionals in Saudi Arabia go through to resist the system?	RO 2-3 To understand the professional identity of Saudi Arabian healthcare professionals and why it leads them to EHR system resistance.

**Table 6. 2** Sub-questions and Research Objectives Related to RQ2.

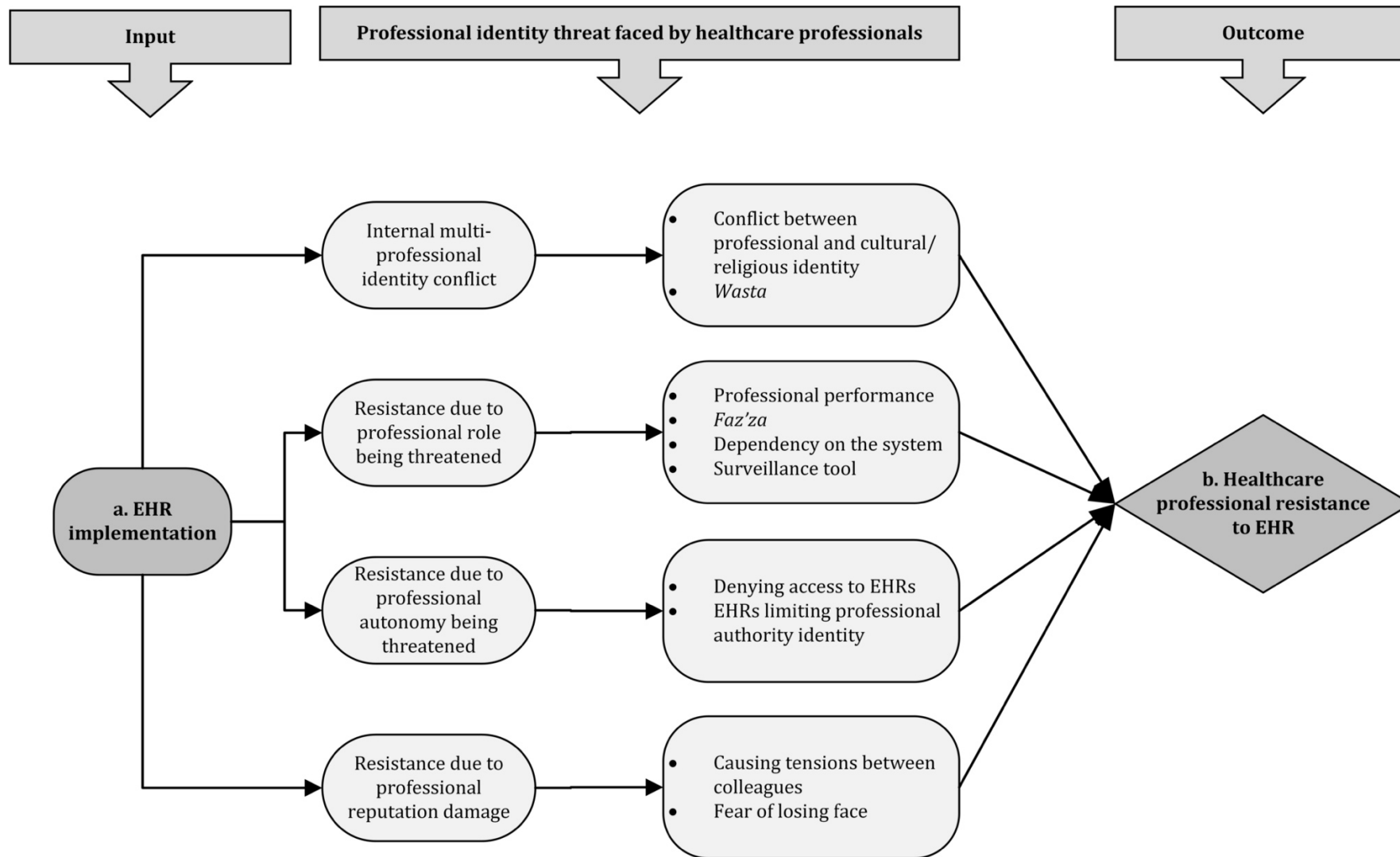


Figure 6.2 Module explaining healthcare professionals' behaviour to resist using EHR.

Furthermore, the present study contributed to the literature by confirming that the EHR resistance to change behaviour from Saudi physicians and nurses is related to cultural factors. We explained the “why” and “how” questions in a developing country context, which many researchers called for to fill the gap in the existing literature. For example, the analysis confirmed that the professional, cultural and religious identity of Saudi Arabian healthcare professionals significantly contributes to EHR resistance in Saudi hospitals. This conflict is between professional and cultural identity and between professional and religious identity, which causes the professionals’ resistance to the EHR. Therefore, using EHR systems causes anxiety and undermines their identities, resulting in tensions between the old and new skills required (Nach & Lejeune, 2009). This causes Saudi healthcare professionals to ask and answer the questions, “Who am I?” “What do I stand for?” and “How should I act?” as a Saudi healthcare professional.

We will now describe in detail how professional identity could explain healthcare professionals’ resistance to the EHR in Saudi Arabia and the four challenges (themes) identified which caused EHR system resistance.

### **6.2.1 Internal Professional Identity Conflict Between Healthcare Professionals’ Multiple Identities**

The first theme we noticed is an **internal conflict between healthcare professionals’ multiple identities**. In the present study, our findings have expressed that healthcare professionals are in conflict with their identities when using the EHR system, resulting in resistance behaviour. Conflict in this situation is at the personal level, within the person themselves, and it is arguably the most challenging form of conflict to manage (Thakore, 2013). Thus, the conflict here can be defined as a struggle between two identities that have different incompatible tendencies (Thakore, 2013).

The conflict between multiple identities arises when more than one identity is elicited in a particular situation, and these identities dictate different commitments or sets of norms, values, motives and goals for the individual (Baumeister *et al.*, 1958; Jones & Hynie, 2017).

Furthermore, the Arabian conceptualisation of professionalism largely overlapped that of their Western countries, which could be attributed to their cultural background (Al-Eraky & Chandratilake, 2012). This reflects that Saudi healthcare professionals are deeply influenced by their cultural background, including the Islamic religion.

For instance, a sub-theme emerged while viewing the participants' responses to our questions: the ***conflict between professional and cultural identity***. We noticed that healthcare professionals are in conflict between their professional and cultural identities and will resist using the system when this happens. Saudi Arabian healthcare professionals consider themselves members of a professional group (Moyo *et al.*, 2016) associated with high levels of power, prestige, requested skills and knowledge and high values (Wald, 2015). These attributes have been gained not only from their extended education (Wald, 2015) but also from their guaranteed place in Saudi society. In Saudi Arabia physicians' image is spotless, and they are appreciated and respected by the Saudi society (Gallagher & Searle, 1985).

Further, the rarity of Saudi physicians also has played a significant part in their feeling of uniqueness and respect in society. According to Alnowibet *et al.* (2021), Saudi physicians represented only 26% of the total physicians in Saudi Arabia in 2015. Hence, their high skills are needed and respected, which frames and develops their self-perception and guides their behaviour as a member of an occupational group (Moyo *et al.*, 2016). Therefore, Saudi healthcare professionals have a high value on their professional self, as it can be the source of their value in Saudi society.

Further, cultural identity has been defined by several researchers. It refers to a feeling of shared origin, beliefs and values that will serve the individual to define themselves among a group of people (De Vos & Suárez-Orozco, 1990). Tajfel and Turner (2004) defined cultural identity as "Part of an individual's self-concept which derives from his knowledge of his membership in the social group (or groups) together with the value and emotional significance attached to that membership." It also refers to "A sense of common origin, as

well as common beliefs and values, or common values, and serves as the basis of self-defining in-group” (De Vos & Suárez-Orozco, 1990, p. 204).

However, in our research, we refer to cultural identity as the sharing values of the Islamic religion that are common among most Muslim individuals, in which that individual can relate themselves to a specific group of people. Hence, there is a strong association between their personal values (from their cultural identity) and their professional values; therefore, once an individual has a self-perception about their professional role or values, it will guide their behaviour in the work environment (Moyo *et al.*, 2016).

Hence, the conflict between those two identities causes healthcare professionals in Saudi Arabia to give their patients **cultural care** instead of professional care. In this research, we have adapted Felemban *et al.*'s (2014, p. 9) definition of cultural care, which refers to “being holistic and respectful of differences and similarities of values, beliefs and lifestyles.” This research identified many forms of cultural care: ***deliberately omitting patients’ culturally sensitive information; not recording patients’ normal medical information when requested by the patient;*** and ***physicians not being in favour of integrating the EHR system with other hospitals.***

Physicians and nurses demonstrated how they are giving their patients cultural care via ***deliberately omitting patients’ culturally sensitive information on the EHR system*** because of privacy concerns, which is related to the patient’s culture, and being respectful to a particular culture and having access too easily to patients’ information. Therefore, culturally sensitive information such as mental health problems and abuse, which are considered taboo, socially embarrassing and forbidden in Saudi Arabia, will lead healthcare professionals to engage in resistance behaviour towards the EHR system. As explained earlier, the Saudi culture values secrecy and has a preference for confidentiality.

As discussed in the Findings chapter, this reflects that both types of healthcare professionals understand their patients’ needs not only from a medical perspective but also from their cultural needs. People with a shared history, language, beliefs and religion share a common

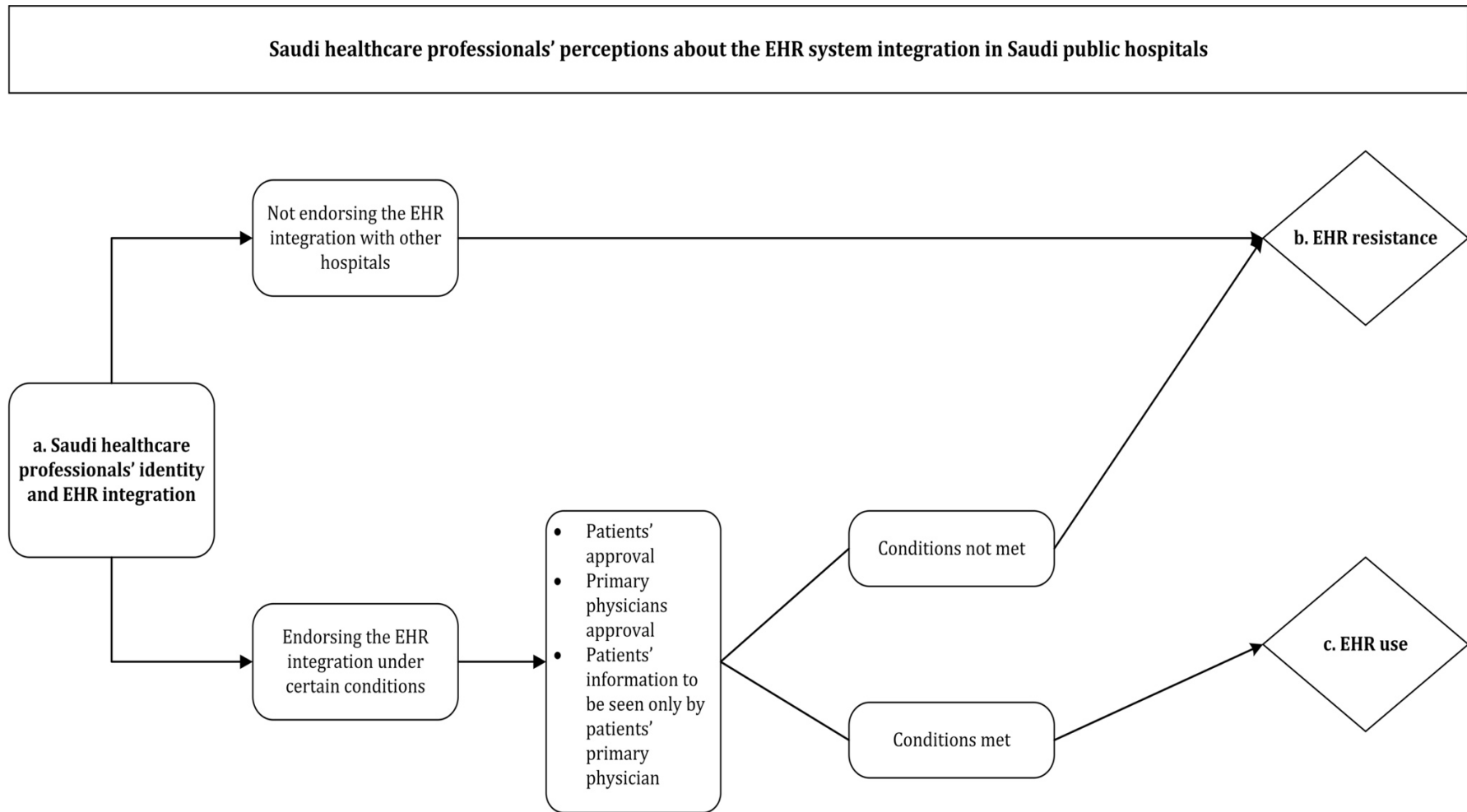


identity (Worchel, 2005). Thus, physicians respect and understand patients' wishes, as they appreciate the importance of this information and how it can be harmful when sensitive information is exposed. This also reflects that the Saudi healthcare professionals' understanding of their patient's needs is because of the responsibility that society has given to healthcare professionals (physicians and nurses). Therefore, they need to maintain this mutual respect and a sense of patient appreciation (Gallagher & Searle, 1985) as it is crucial for their professional identity.

Furthermore, both types of healthcare professionals have advised that they ***will not record patients' normal medical information if they request them not to***. This could also be explained by the collectivist culture of Saudi Arabia, which is a theoretical dimension of cultural variability used to understand and explain different people's behaviour (Hofstede, 1984). Members of the collectivistic culture are influenced and governed by the moral standards of the group (Ting-Toomey *et al.*, 1991); hence, they value group goals, concerns, needs and values over those of the individual (Ting-Toomey *et al.*, 1991). Therefore, it will result in physicians respecting patients' wishes, or even if the patient has not requested his own information to be not recorded, physicians will not record it because they understand the culture, and as healthcare professionals with firm values, they will respect their patients' wishes.

We have also noted that physicians do not favour ***integrating the EHR system with other hospitals***. This can also reflect their concerns about having patients' information available in another setting where they are not being treated. Further, they fear staff in the other hospital could misuse this information. To explain, some physicians have informed us that they even do not want to have an integrated system in the same hospital because anyone, regardless of their title or hospital role, can access the patient information. Figure 6.3 explains how Saudi healthcare professionals perceive EHR integration of the system with other hospitals. The diagram starts with (a) and ends with the healthcare professionals' actions (b & c).

However, some physicians informed us that they would only accept EHR integration under certain conditions. For instance, a written approval from patients to write their information



**Figure 6. 3** Saudi healthcare professionals' perception of the EHR system as an integration module.

in an integrated EHR system or their primary physician approval, and if it is to be shared with another hospital, only his primary physician at that hospital can see it. This can be explained in the Saudi Arabian context because, as discussed earlier, the Saudi society is collectivist and this is how the group's moral standards govern a collectivist society.

Hence, it could be seen that *Urf*<sup>24</sup> has a significant influence here because, in Saudi society, people's private information should not be spoken about or seen by anyone, especially when the person is vulnerable such as the patient might be. *Urf* is important in a Muslim's life as it can set the roles of what to do and what not to do (Saleh, 1989). Therefore, by the social law (*Urf*), physicians believe it is one of their duties as Saudi healthcare professionals to protect their fellow religious' sensitive medical information<sup>25</sup>.

In addition, another sub-theme noticed is ***the conflict between professional and religious identity***. Religious identity refers to the personal sense of affiliation to a specific religious group and incorporates that group's beliefs, values and practices (Héliot *et al.*, 2020) which sharpens their response to a particular circumstance (Ysseldyk *et al.*, 2010). The religious identity of the Saudi Arabian healthcare professionals is strong, and the society itself is referred to as being a conservative and religious society. Hence, we have noticed that healthcare professionals might have formed a new professional identity, which we can call a ***Muslim professional identity***. Muslim professional identity in this study refers to a sense of self as a healthcare professional that is associated with a particular religious group and embraces the group values over professional values.

This conflict between the professional and religious identity came from ***not recording medical information that could be harmful to the patient***. To illustrate, our findings revealed that this is the third type of information in which healthcare professionals, especially physicians, resist the system to not record this kind of information. Figure 6.4 explains these interesting research findings that revealed three types of medical information in Saudi Arabia represented by (a, b. and c.), then how healthcare professionals process this

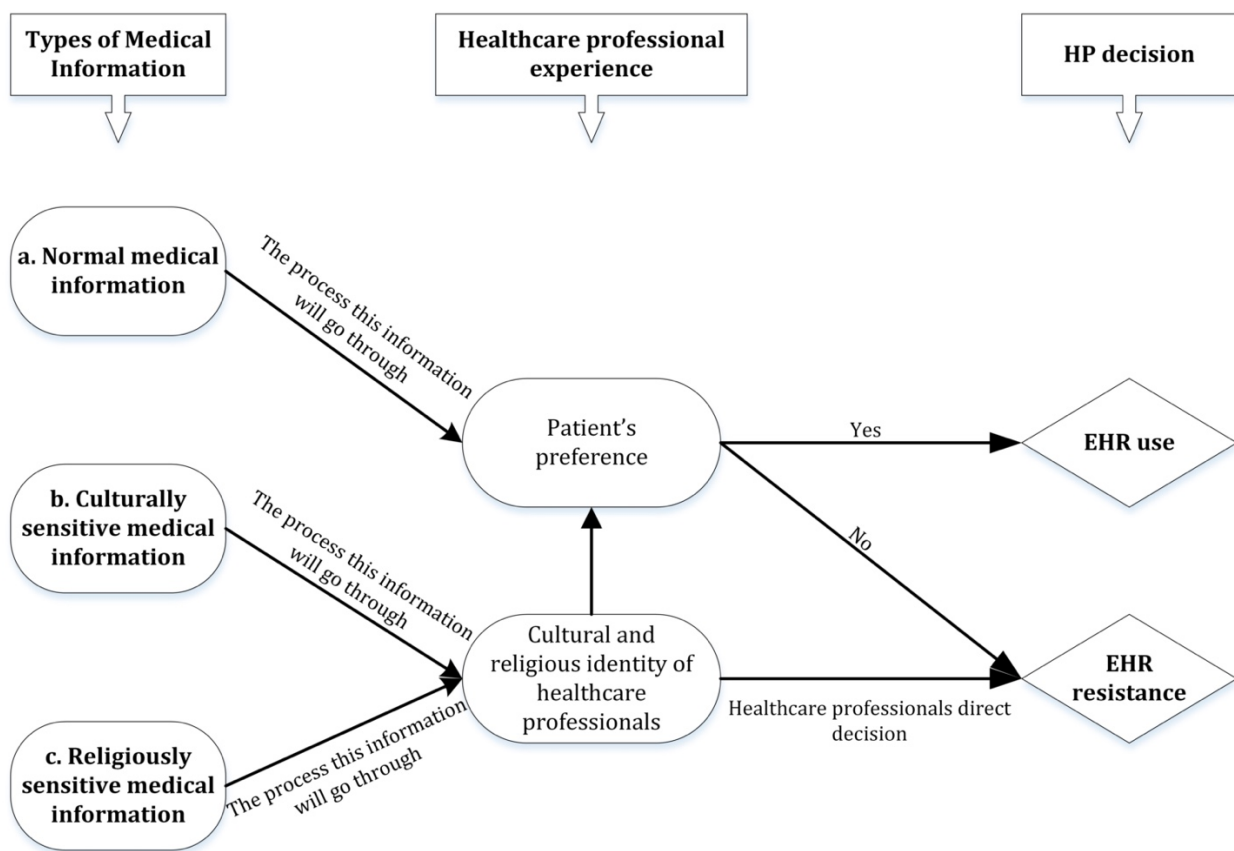
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<sup>24</sup> Chapter 3 for more information

<sup>25</sup> Figure 4.6

information and finally, the last two boxes show healthcare professionals' decisions whether to resist the system through not recording information or to use the system and record the information.

As such, this could be related to their religious identity as a Muslim healthcare professional, and this religious commitment is often seen as the core of an individual's sense of identity (Coşgel & Minkler, 2004). Therefore, religion can influence individuals' workplace decisions, yet the opportunity to express their religious identity in their work affects whether and how a person does so (Héliot et al., 2020).



**Figure 6. 4** Types of identified medical information from the Saudi Arabian healthcare professional perspective.

However, occupational staff, such as professionals (physicians and nurses), consider themselves a vital part of the healthcare organisations, and in an Islamic environment such as Saudi Arabia, they will be comfortable expressing that type of identity as our data have shown. Hence, the religious affiliation of the Muslim healthcare professionals in Saudi Arabia

resulted in a powerful behaviour shaping them to resist the EHR system. The word “Islam” in Arabic, as discussed earlier in Chapter 3, means “submission” reflecting the central core of Islam which is submission to the will of God (Sabry & Vohra, 2013). Hence, the physician here is submitting to the will of God in protecting the confidentiality of the misconduct of their fellow Muslims, as they believe in the Hadith<sup>26</sup>, which means if you protect your brother’s need, God will protect you on the judgment day.

In addition, this could be explained as Saudi healthcare physicians expressing their ***Al-Amanah*** attitude, which is one of the core values of a Muslim. *Al-Amanah* is a practice of devotion and a religious obligation for every Muslim (Shuhari *et al.*, 2019). The *Al-Amanah* word is derived from *Al-Amn*, which refers to feeling secure from the violation of others to his rights (Shuhari *et al.*, 2019). In this study, *Al-Amanah* refers to healthcare professionals’ religious obligation to protect their patients’ best interests as part of their professional, cultural and religious duty.

Therefore, Saudi physicians view *Al-Amanah* as a request directly from God, and one of their obligations to their fellow Muslims. Hence, the *Al-Amanah* concept influenced Saudi physicians as they see themselves as the guardians of patients’ welfare and privacy, resulting in resisting the EHR system by not recording any information that could harm their patients.

Furthermore, culture and religion control people’s behaviour in a profound and persistent way (Alexander *et al.*, 2017), and Saudi culture values secrecy or preference for confidentiality. Yet, this could affect the quality and quantity of information disclosed in the healthcare setting (Kwong & Levitt, 2009) and this is what we have found in our data. Because of their behaviour of not recording patients’ information, they expressed another problem: ***resistance due to sensitive patients’ data***. Not recording sensitive information affects the patient’s quality and quantity of information and might affect the patient’s

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<sup>26</sup> The Hadith is “Whoever shields (or hides the misdeeds of) a Muslim, Allah will aid him in this world and the Hereafter. And Allah will aid his Slave as long as he aides his brother” (Taha, 2019, p. 71).

treatment plan. As explained earlier, a lack of information will affect how healthcare professionals perceive themselves, and hence, will affect their work.

Furthermore, as shown in the previous chapter, there are differences between physicians' and nurses' perceptions of the EHR and, ultimately, their resistance behaviour towards the EHR system. This is that ***physicians are more resistant to the EHR system when it comes to protecting patients' information***, while ***some nurses are not***. This could be explained as nurses and physicians have different roles, and each are in a different hierarchical position (Lotan, 2019). Therefore, each of them has their own reasons through their mindset, which have been affected by their professional identity, to resist the system.

To illustrate, some nurses expressed that they would record patients' ***culturally sensitive information on the EHR system***. Some have explained their decision due to being on the safe side and not having as influential a role as physicians, hence, preferring to comply with the hospital policy in recording all of the patients' information. This could be related to how nurses view themselves, as despite having a strong professional identity, they might feel that they still do not have the power of physicians to take such a decision or to risk their job due to the hierarchical position at the hospital (Migotto *et al.*, 2019).

In addition, as explained above, ***physicians are more resistant to the system***, which could be because ***physicians care about patients' privacy***. For example, all physicians have expressed that they will not record patients' information if they do not want them to, or if the patient asks them not to, as part of being a professional is expressing respect for local customs, beliefs and cultures (Al-Eraky *et al.*, 2014). This could be related to how Saudi Arabian physicians perceive themselves at the hospital, as they consider themselves at the top of the hierarchical chain and have autonomy over their decisions (Al-Eraky & Chandratilake, 2012).

Further, *Al-Amanah* could have affected their feelings about being the patients' information gatekeeper. Hence, they believe that as a professional they should protect their patients' best interests (Abouzahra, 2014; Walter & Lopez, 2008), even if that means they will break the

hospital policy. This is because they *do not trust the system with their patients' information (e.g., not recording an HIV-positive status or not recording the positive Covid-19 cases) and they do not want to integrate the EHR system with other organisations*, even if it is the same branch hospital but in another location.

This strong perception from physicians reflects their power as Muslim healthcare professionals and how far they will go to protect their patients' information and express their professional identity. In addition, cultural aspects significantly impact their decision not to record patients' information. Physicians may share a common set of values that could be recognised globally; however, the cultural influence on physicians could lead to some differences (Al-Eraky & Chandratilake, 2012) which we have seen and discussed earlier.

Another sub-theme that has been highlighted and could be considered regarding why physicians resist the system more than nurses is **Power**, which refers to the capacity of the Saudi physicians to express their will in their work. For example, Saudi physicians know that they have the power to ask another colleague to use their account, either to write patients' information down or even to use others' EHR accounts. This might be because Saudi physicians believe they are the most critical element in healthcare organisations. Therefore, they recognise their power and will ask others to submit to their will if they outrank them. Hence, this power came from their knowledge about the importance of their professional identity, and their position in the hierarchy of the healthcare organisation (Beddo, 2013), and in their society in a country with a culture such as the Saudis, where the more educated you are, the more respect you gain.

Therefore, part of their professional identity is performing leadership roles in their organisation (Beddoe, 2013) and expressing their dominance over other professional groups (Hotho, 2008), even among their physician colleagues. Hence, this has been recognised during the interviews by ***using their power to make low-ranking physicians enter patients' information on their behalf*** for multiple reasons, for instance, to get away from a medical error, or maybe simply not wanting to use the system and using their authority and power to request the resident physician to write it on their behalf.

Nurses have also supported this sub-theme by highlighting that ***they sometimes help physicians do their patient documentation instead of them***. However, what the nurses highlighted could be looked at from a cultural perspective. As such, nurses in the Saudi Arabian culture feel they are physicians' assistants, which the interviewer felt from what nurses said during interviews. It has been argued that the relationship between physicians and nurses can also be influenced by societal roles and cultural norms (Makaram; 1995; Hojt *et al.*, 2003) and it plays a vital role in the physicians-nurses collaborative relationship (Hojat *et al.*, 2003). To illustrate, in Saudi Arabia, the nursing job is set to reduce the individual's social role and status (Alnowibet *et al.*, 2021). Hence, this could explain why nurses feel they must help healthcare professionals, which endorses physicians' perspective of a nurse as their assistant.

Thus, from what the nurses are saying, they consider themselves as assistants to the physicians, as in the ME cultures, nurses are often perceived as physicians' "handmaidens" (Hojat *et al.*, 2003). The relationship between nurses and physicians could be considered as the physicians being the authoritarian with a dominant and controlling side, while the nurse is the submissive and obedient part of this relationship (Lotan, 2019). Therefore, Saudi Arabian nurses are expected to record orders or patient information onto the physicians' EHR system without discussing it with the physician or refusing to do so. Hence, this hierarchical relationship between nurses and physicians (Tang *et al.*, 2013), which both are aware of, encourages the physicians to resist the system by requesting nurses use their accounts instead of them. Consequently, nurses are helping physicians to resist using the EHR system by documenting instead of them.

***Wasta (واسطة)*** is another sub-theme that emerged, and it is an Arabic concept of personal connection and refers to connections, network contacts and nepotism (Harbi *et al.*, 2017). Nepotism is the favouritism of a family member or friend, as Arabs highly value and respect these relationships (Alkahtani *et al.*, 2013). Arab cultural practices prioritise the tribe, family and friendship over the organisation, and they are more influential than governing factors (Alkahtani *et al.*, 2013).



*Wasta* is a “type of personal relationship that is used to ‘get things done’ (Branine & Pollard, 2010, p. 16), and it is a significant force in Arab life and central to decision-making and the creation of opportunities (Hutchings & Weir, 2006). However, in this research, *Wasta* refers to how Saudi individuals use their relationships to achieve something in their favour or that they need. Despite some differences in how they can use it, physicians and nurses have both identified this sub-theme.

To illustrate, physicians expressed that they use their *Wasta* to ***use their colleague’s EHR system account*** to get past the system when it diminishes their authority (e.g., medical prescriptions) and uses their ***Wasta to get things done from the lab***. This is because their professional identity as healthcare professionals conflicts with their cultural identity, resulting in their resistance to the EHR system via activating their social relations to re-connect with their professional identity.

In addition, concerning the nurses, some have highlighted that they will ***use their Wasta and relationships not to record their relatives’ information***, as their colleagues, regardless of their position in the hospital, could access it. For example, many nurses have told us that if some of their relatives are being treated at the same hospital they work in, they will engage in resistance behaviour by not recording their relatives’ information, especially if it is socially or religiously sensitive.

Indeed, this could be related to the context of Saudi Arabia, as the tribe system means kinship or family always comes first; hence, it significantly impacts the individual’s behaviour (Aldraehim *et al.*, 2012), and, therefore, families in Saudi Arabia are an essential component of the individual’s life and reputation. To illustrate, nurses expressed that they will not record their relatives’ information, especially if it is socially or religiously sensitive. Therefore, religiously sensitive information resistance will be undertaken to protect their relatives from any legal or social consequences because, in a tribe society, individuals are expected to maintain a good relationship with their relatives and help them when needed (Zakaria *et al.*, 2003).

Furthermore, we have identified another form of *Wasta*; however, it has only been highlighted by nurses: ***Et-Moone***. This form of *Wasta* (*Et-Moone*) happens when some nurses have a deep and personal relationship with other healthcare professionals to exercise their ability to get past the system. *Et-Moone* refers to a type of relationship in Saudi Arabia where “partners allow for unilateral decision-making without damaging the relationship” (Abosag & Lee, 2013, p. 609).

They have mentioned many reasons to use their *Et-Moone* relationship. For example, an interesting finding of how the *Et-Moone* relationship is strong in the Saudi culture and how the two parties that engage in this type of relationship have a mutual trust is ***using Et-Moone to share their account password*** to write medical prescription orders and request lab tests. Sharing personal account passwords is a potentially hazardous move; hence, establishing a personal relationship is the first step to gaining trust in Saudi Arabia (Goby *et al.*, 2016).

However, as we discussed, this is because they have a deep *Et-Moone* relationship with higher ranking or other healthcare professionals who have privileges that nurses do not. Nurses told us that they use this because they do not have the authority that they used to have before the EHR system was introduced, and this caused their social status and professional identity to be diminished. Hence, they will resist the EHR system by using their *Et-Moone* relationships.

Moreover, nurse participants have also demonstrated their ability to use their *Et-Moone* relationship to ***protect relatives' sensitive information and delete it or change it*** when needed, such as when their relative has a positive HIV status, before it is recorded on the file, as we showed with what H1N5 said. In addition, the participant told us they could use this relationship to prevent the information from going out of the lab and being recorded in the EHR system. Hence, they will call the person they know in the lab to change the result. Clearly, this could be interpreted, as discussed earlier, as the importance of family and kinship relations in Saudi Arabia.

In addition, both types of participants expressed how the system does not help them and is hard to navigate, hence, there is ***resistance due to the complexity of system navigation***. This might be because people from high-uncertainty avoidance countries, such as Saudi Arabia, might get anxious when they face uncertain situations. Consequently, they need a formal navigation structure with more control to prevent them from getting lost or being unable to do their work. Thus, the designer should consider the cultural factors when designing the system with regard to presenting the information (Perchonok & Montague, 2012; Khanum *et al.*, 2012). Therefore, the system interface is critical and becomes more important in healthcare settings because a well-designed interface will allow the system's functionality to support the users' tasks (Khanum *et al.*, 2012).

Furthermore, a shared view among interviewees was ***resistance due to a lack of training***. It is one of the sub-themes that physicians and nurses have noticed which could be related to our research context. To illustrate, a lack of training has been noted in the Arabian culture: training that meets the needs of the employees (Obeidat *et al.*, 2012). Moreover, Arabic managers such as those in Saudi Arabia, unlike Western managers, think of training as a cost rather than an investment (Alrasheed, 2001); this could result (as seen by our participants) in having employees doing their job less effectively.

Our study has confirmed that resistance is associated with professional identity; hence, concerning the first sub-theme, our findings found that social factors, such as religion and culture, are the main reasons Saudi healthcare professionals resist the system. The previous literature partly supports this result about the effect of a social factor on EHR resistance (Kim & Kankanhalli, 2009; Samhan & Joshi, 2015; Boudreau *et al.*, 2014). Yet, these studies have not considered cultural and religious influences on social factors (Samhan, 2017), and that this is the appropriate lens through which to get an in depth understanding of the phenomenon (Gal & Kjærgaard, 2009; Nach, 2015). Thus, our study has addressed this gap by adopting the identity theory as it provides a valuable lens through which to account for understanding resistance within a healthcare setting (Stryker, 2007; Stryker & Burke, 2000).

In addition, the current study finding is contrary to previous studies, which have suggested that social influence does not impact the medical professionals' use of EHR (Jeng & Tzeng, 2012; Alhirz & Sajeev, 2015). Nevertheless, our study is unique because we found, for example, that *Wasta* and *Et-Moone*, Saudi cultural habits, play a significant role in physicians' and nurses' resistance to the EHR system, either to help themselves or their patients, which was not seen in the literature before.

Therefore, by considering cultural and religious factors, this research addresses the comment of Samhan (2017). In her paper, she indicated that previous studies only considered workplace influence as a source of social influence while ignoring other aspects such as culture, family and religion. Further, we are answering the call of Graf-Vlachy and Buhtz (2017) to adopt a multi-theoretical approach to understand better the social influence of EHR use.

Furthermore, our study contradicts Mosse and Byrne (2005) whose results claimed that physicians have perceived implementing the EHR system as a personal benefit, which they could use to get a better job opportunity in a better hospital. Our findings indicate that healthcare professionals view their power as not having the system threatening their power. An explanation for this contradiction is that their study was conducted in rural areas where the physicians were eager to move to a better hospital. In comparison, our study was conducted in two of the best hospitals in Riyadh, Saudi Arabia.

Moreover, our findings contradict Bernardi and Sarker's (2013) results which indicated that healthcare professionals only engage in EHR resistance when it is beneficial to them. However, our study found some findings that could support this claim, yet, we found no evidence of how this could be true in the Saudi Arabian context. For example, physicians might resist the system when it is convenient to them to protect their relatives' information, however, they still reported their resistance to the EHR to protect their patients' information whether the patient requested it to be recorded or not. Hence, this shows that Saudi Arabian healthcare professionals are not resisting the EHR system because it is beneficial for them; rather, it is due to cultural and religious beliefs.

Another interesting result is that physicians in Saudi Arabia prefer not to integrate their EHR system with other hospitals in Saudi Arabia, and, surprisingly, not even in a site of the same hospital which is in another city. This refusal to integrate is due to many reasons such as patients' privacy protection, and physicians' feeling that patients' information belongs to them as a healthcare professional. To illustrate, one of the hospitals we interviewed in has different sites in different cities across the country, and physicians do not want their patient information shared with other sites.

This result is consistent with O'Malley *et al.* (2015) which reported that a lack of integration with the EHR system causes physicians not to use the system, and also with Baudendistel *et al.'s* (2017), Alqahatani *et al.'s* (2017) and Alanezi's (2021) conclusion that healthcare professionals are concerned with patients' data security and protection. However, these previous studies have not investigated 'why' they are concerned, or 'why' patient privacy is important to healthcare professionals, and whether their concerns are the same as other healthcare professionals in other countries. Our findings answered the 'why' question and discussed it in detail. Further, our result is not consistent with the recent study of Upadhyay and Hu (2022), as their study concluded that EHR integration had been perceived as an essential aspect of EHR. These contradictory results could be explained using the context of Saudi Arabia and the preference for privacy.

### **6.2.2 Resistance due to the Professional Role being Threatened**

**Resistance due to the professionals' professional role being threatened** is the second central theme that has been generated. The professional role is "The definition of self-in-role and includes goals, values, beliefs, norms, and interaction style that are typically associated with the role" (Chreim *et al.*, 2007, p. 1515). According to Stryker and Burke (2000) the role is external and linked to social positions within a social structure, while identity is internal and consists of the expectations associated with the roles.

Hence, how professionals view their role is vital in how they behave in a work setting (Ashforth *et al.*, 2008) because, as a healthcare professional, their role grants a degree of

privilege (Slay & Smith, 2011). Failure to convey impressions that are consistent with one's role not only diminishes one's effectiveness in that role, but could also cause the individual to lose the right to enact the role (Ibarra, 1999, p. 764).

As we will see next from the data, Saudi Arabian healthcare professionals view their role as not only a fixed professional role but also a flexible professional role that adheres to the social, cultural and religious norms. Therefore, this role as a healthcare professional has granted them a privilege in Saudi society, along with high social status and salary. Thus, in their perspective, it is vital to protect this role associated with these benefits that come from not only their organisation but also from the society itself.

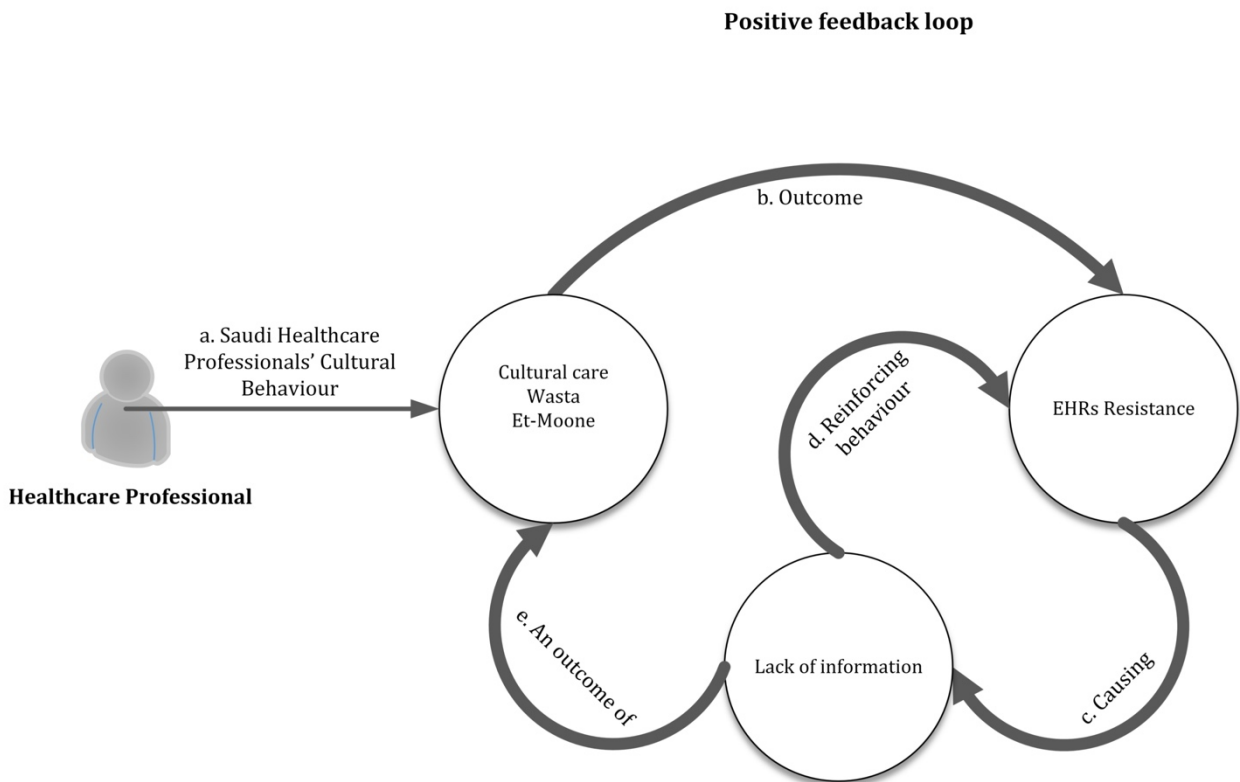
Four sub-themes have been identified under this theme. The first is that participants informed us that they would **resist the EHR because of their healthcare professionals' performance**, which refers to what professionals believe should be the standards to which they accomplish their work. For example, when a professional thinks that their performance at their job is not what it should be, their self-perception about their role as a professional will be damaged, and in a healthcare context, physicians mention how their performance in providing **quality care for their patients** is affected negatively.

Saudi Arabian physicians expressed how they believe the system is not helping them give their patients the desired quality of care that they should deliver. Quality of patient care is one of the physicians' most essential roles, and some physicians have highlighted the importance of quality care for them as a healthcare professional. According to Nortvedt *et al.* (2008, p. 333), some physicians define their professional role as delivering a high-quality medical care, along with responding to the patients' medical needs. Therefore, as explained earlier, Saudi Arabian physicians would resist the system if their role as a healthcare professional is affected, such as the quality of care of their patients.

However, on the other hand, nurses expressed that they ignore and resist the EHR system because it **does not provide accurate information about their patients** because of the above-mentioned resistance behaviour from other healthcare professionals, such as not

recording all information. This behaviour created a positive feedback loop in which some users of the EHR system intentionally did not enter information due to reasons of a cultural nature, yet, they will again intentionally resist the EHR system because of not having enough information about their patients.

Hence, Figure 6.5 explains the situation. It starts with (a) representing the Saudi healthcare professionals' cultural behaviour (e.g., Wasta), then the outcome of this behaviour, (b) which is EHR resistance, and (c) representing the cause of EHR resistance. After this point, the users started creating a positive feedback loop by (d) reinforcing their resistance behaviour due to a lack of information. However, this represents a lack of information which is an outcome of the cultural behaviour in the first place.

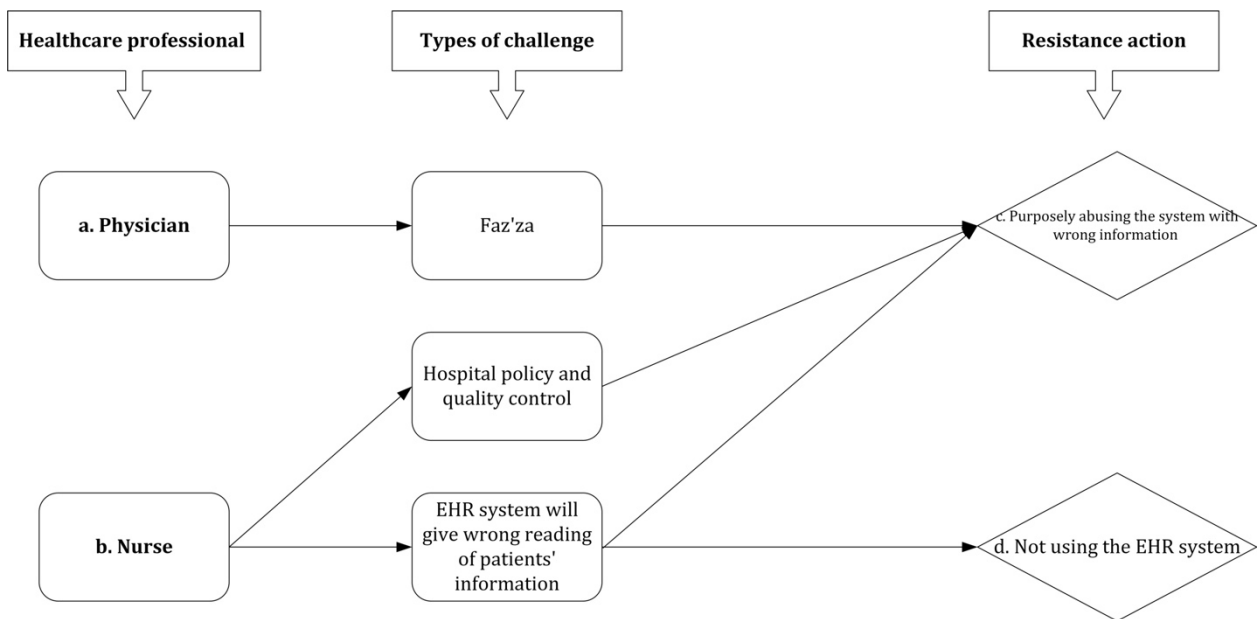


**Figure 6. 5** Model explaining how social and cultural resistance behaviour causes positive feedback loop.

Other nurses have also expressed that they are resisting the EHR system by ***purposely not recording the right or accurate information***. This is due to the pressure from the hospital and ***quality management control*** to record the patients' information within two hours of the

end of the consultation time. Further, due to the EHR system being general, it *should be more specific to each unit at the hospital.*

According to the interviewees, they do not have the time to record information within the period requested by the quality management department. Therefore, they either engage in resistance behaviour through not writing accurate information or simply not using the EHR system and not being engaged in writing wrong information about the patient. Hence, either they purposely write wrong information to finish faster in order to help their patient, or do not use the EHR system and do not engage in writing wrong information. Furthermore, nurses have also said that they will purposely abuse the system with wrong information because if not, the EHR system will read the entered data in the wrong way. Figure 6.6 is a model that starts with a & b as the type of healthcare professional, then details the challenges they face, and ends with c. & d., the resistance action they are involved in.



**Figure 6. 6** Professional identity challenges face by healthcare in Saudi Arabia and their response.

Here we can explain both types of healthcare professionals' responses regarding how the system affects their performance and their decision to resist the EHR due to cultural matters. Both types expressed the importance of the patient's care quality, despite how differently



they expressed it and the different factors that led them to say it. It might be that because when healthcare professionals care about the quality of their patient's care, they are not waiting or expecting any rewards from the patients, their families or even the hospital administration. As a people of faith and religion, they care because they consider it to be *Ehtesab* (احتساب). *Ehtesab*, in the Arabian context, means they do not expect rewards from people, and thus it is when physicians and nurses do their best in their clinical work and duties and then expect rewards from God, whether in this life or afterwards (Al-Eraky *et al.*, 2014).

*Ehtesab* makes it less necessary for hospitals to rely on other options of rewards or punishment to motivate physicians who stick with their own high level of professional conduct (Al-Eraky *et al.*, 2014). According to the data, *Ehtesab* strengthens the physicians' professional identity, as they believe they will get their reward from God, and good deeds come to people who do good work to satisfy God, so they will do what they think is ethically correct.

Hence, they are aware that they will be held accountable by the hospital when the system is not being used and still would not use the EHR system in order to believe they are maintaining high-quality care for their patients. Despite maybe breaking the policies or even recording incomplete or inaccurate information, they believe they are doing something more significant, which is providing quality care for the patient. This shows how the culture in Saudi Arabia has a strong effect on healthcare professionals' behaviour towards the EHR system.

The second sub-theme is that physicians expressed that they will ***purposely abuse the system by documenting wrong information on the EHR system to protect fellow Muslims***, or as we interpreted it in the Arabian culture, called *Faz'za* (فزعنة). *Faz'za* can be defined as a way to show solidarity and kinship to one another (Hashem, 2022). In this research, *Faz'za* refers to how Saudi healthcare professionals show their support and solidarity to their kinship, friends, relatives and others who need help by protecting their medical information from being recorded.

*Faz'za* is different to *Wasta* and *Et-Moone*, as the agent or the individual who is engaging in the *Faz'za* behaviour does not need to know the other person who needs help: being a relative or friend is not necessary here. Healthcare professionals in this situation do not need to know the patient in order to resist the EHR system by not recording any patient information. Hence, this behaviour is, in this case, done purely by helping the patient and receiving God's blessing.

The third sub-theme is that ***dependency on the EHR system*** has been noted and resulted ***in reduced physical examination time with the patient***, which, over time, caused ***physicians to lose their professional critical thinking and clinical skills***. To illustrate, physicians now have less time with their patients due to the hospital policy requiring them to record everything on the system. Interestingly, this has also caused professionals to lose their medical judgment through noticing that the new generation of physicians does not have medical judgment due to their reliance on what the EHR system is saying about patients' medical conditions (e.g., blood pressure) without having physically examined the patient. Consequently, this has made them less reliant on their medical skills and more dependent on the EHR system.

Further, high dependence on the EHR system changed the requirements of the physician within the labour market. Physicians with high IT skills are now more valuable and attractive to hospitals than physicians with less or no knowledge about the EHR system. Hence, this has resulted in hospital administration now assessing healthcare professionals based on their usage of the EHR system, not by their skills as healthcare professionals, which they spent many years developing and learning.

Perhaps this could be related to how physicians see their importance, which has been kept in place for centuries, and a large part of it is because of their high-level skills and knowledge, which no one can acquire without going through a long and high level of education and practice. For instance, Saudi physicians' professional identity has been formed during their long seven years of education (compared to nurses and other disciplines) and dealing with a

highly competitive market. Further, physicians recognise their importance socially in Saudi society and economically through their rare skills and knowledge.

Therefore, this professional identity formation<sup>27</sup> prepared them to handle challenging situations and adapt to increasingly complex problems, because physicians' professional identity and skills will not advance without encountering problems and challenges (Kalet *et al.*, 2021). In other words, for their professional identity to develop, and the medical skills that make them feel special and that they want to acquire, they will require an environment that will help them to make that transformation. Hence, when they feel that using the system is not increasing their medical skills, eventually, their self-perception about their professional identity will be threatened, resulting in their resistance to the EHR system, as it will take away their advantage of what makes them unique as a professional over any other profession, such as nursing.

In addition, in societies with cultures such as Saudi Arabia's, physicians gain their prestigious status from the society because of the knowledge and rare skills they acquire (Zakaria *et al.*, 2003). Hence, they see their importance and their advanced place in Saudi society because of their medical skills, and if they lose them and become easy labour to be replaced, they will lose this prestigious status in society. Therefore, to protect it, they will resist using the EHR system, as it becomes a threat to their professional identity.

The nurses have expressed the ***failure to have the time to provide psychological care to their patients***, which could be equivalent to medical skills for physicians. Psychological care in this study refers to providing emotional comfort to the patient. Nurses believe that their job is not only to give medication or see a patient but also to include compassion, talking, understanding and giving the patient the psychological support that they need. Thus, in their

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<sup>27</sup> Professional identity formation for physicians has been defined as "The process of internalizing habits of thinking, feeling, and acting like a physician" (Kalet *et al.*, 2021, p. 2).

view, they believe the system has taken away one aspect that makes nurses better than physicians.

Further, nurses understand that physicians have limited time for their patients, but nurses should have this time, as their job is to take close and professional care of their patients. Professional care refers to “Formal knowledge acquired through systematic training, which is used to understand a patient’s unique circumstances” (Priest, 2013, p. 7). Hence, they highlighted how sometimes they would not use the system for a full day just to take better care of their patients because they feel the system made them a robot, not a nurse.

It is apparent that this could be explained due to the culture in Saudi Arabia. To illustrate, psychological and compassionate care are usually female characteristics, and in Saudi Arabia, more than 61% of nurses are female (Saleh, 2022) which could explain the importance of psychological care to Saudi nurses. Thus, nurses in Saudi Arabia will choose to resist using the EHR system if it is not fulfilling their professional obligation. This is because they find it difficult and it is conflicted with their professional identity when working in a context that is not designed to provide patient-centred care<sup>28</sup> (Aagaard *et al.*, 2017).

Moreover, caring is considered a vital part of Saudi society and a central belief of Islamic teachings (Alboliteeh *et al.*, 2017). Hence, Saudi Arabian society is considered a feminine country (Al-Twaijri *et al.*, 1996), which explains the nurses’ need to provide high-quality care. Nurses believe they are responsible for providing quality intervention via a deeper understanding of the patient’s situation and having a bond with the patient, producing positive patient outcomes (Black *et al.*, 2011).

Therefore, providing psychological care is vital for nurses’ professional identity in Saudi Arabia because they consider compassion for the patient’s situation an essential component of their nursing care (Dietze & Orb, 2000) and as they are Muslim nurses. After all, caring for patients is what distinguishes nurses from other professionals, and it is a skill acquired

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<sup>28</sup> Patient-centered care is “Patient involvement, establishing a relationship between nurse and patient, and a focus on the context where care is delivered” (Aagaard *et al.*, 2016, p. 619).

through the process of becoming a nurse (Priest, 2013, p. 7). Thus, Priest (2013) suggested that taking care of patients and caring for the patient are not the same, and the latter is what the nurses are informing us of: that the EHR system is preventing them from doing this.

The outcome of the resistance to the system is a ***professional role not being fulfilled***. Nurses have expressed that their professional role is to give medication, but the medical plan may have been interrupted because of the lack of information on the system, which is due to having generalised information or inaccurate information. They further expressed that their job or even a surgical operation could be delayed for the patient because they lack the information about the patient in the EHR system or they lack the authority to use it. When a professional role is not fulfilled, healthcare professionals' self-perception will be affected and might be damaged.

The fourth and final sub-theme which emerged is ***resistance to the EHR system, as healthcare professionals see it as a surveillance tool to monitor their work***. It refers to how the system controls or limits their professional identity as a healthcare professional. A physician requires a robust professional identity “both ethically and practically” to practice with confidence. Hence, their knowledge and skills need to develop a strong professional identity for them to be a successful physician (Wilson *et al.*, 2013).

Saudi physicians expressed their anger about how the system controls them and limits their ability to perform their role as healthcare professionals. These roles have been granted to physicians for decades, especially in Saudi Arabia, due to their rarity and much-needed skills. For example, in Saudi Arabia, physicians view their decisions as unquestionable and that they should be enforced without hesitation (Alharbi *et al.*, 2019). Therefore, the introduction of the system changed or limited some of their roles.

To illustrate, a physician expressed they are now being controlled regarding the prescribing of medication, including the amount that should be given to their patients. The interviewee explained how physicians are restricted from doing their professional roles because of the system. They now have to either comply with what the system is saying about the patient's

situation, or if not, they would be held accountable for not following what the system is saying. Hence, because of their knowledge and status in society, Saudi healthcare professionals expect a less controlling working environment and their decisions should be trusted and not questioned. Therefore, they will resist the EHR system when they feel they are being monitored or controlled.

There are many reasons why physicians feel the system controls them. For instance, ***they felt the need to justify their medical treatment plan to the system and wait for the pharmacist's approval***; otherwise, it will not be accepted. This is because physicians have a strong identity; hence, they think they do not need to answer to anyone regarding their judgment on prescriptions. Further, Alharbi *et al.* (2019) stated that Saudi physicians perceive themselves as better than nurses and pharmacists due to their responsibilities and prestigious status as physicians in Saudi society, which could explain their resistance to the EHR system.

Therefore, this shows that physicians believe their orders should be followed, not the other way around. For example, Alharbi *et al.*'s (2019) study interviewed physicians who mentioned that they usually tell their other healthcare professionals (nurses & pharmacists) not to question their decision because they are the experts as a physician. This could also be explained as Saudi Muslim professionals having their own self-accountability, which is in Islam called *Taqwa* (تقوى), and it is strongly linked to the Saudi healthcare professional identity. *Taqwa* refers to how they monitor their own behaviour without a human supervisor (Al-Eraky *et al.*, 2014).

Hence, as Muslims, they are committed to being good, not because people are watching them or that they are afraid of being punished by their superiors at work, but rather because they believe that God witnesses them, and by doing this, Muslims will be rewarded for that by God. Therefore, as a Muslim, answering to God is the ultimate goal and priority (Ishak & Osman, 2016) because if I am doing what God wants me to do, then I am not doing something wrong, and there is no need for human intervention.

In addition, physicians look at their role in their community as care providers for their patients (Tallis, 2006). Therefore, they view their decision-making independence as a core part of their role, and whatever consequence may follow that decision, they believe that God, not humans, will judge it. Hence, physicians regard these values as a symbol of their professionalism and commitment to their patients, which is beyond their 'employment contract' (Abouzahra, 2014), to reflect their commitment to God and their society through *Taqwa*.

Quality check control is another sub-theme that has been noticed, and it means that healthcare professionals have a limited-time policy in which to complete their documentation. According to the physicians, because of this policy, they are now ***being assessed based on their system usage, not their skills as healthcare professionals***. However, physicians' dissatisfaction could be related to the Saudi context of the ***insignificance of time culture*** among the Saudi employees.

To illustrate, this is because Saudi physicians believe there should not be any time limitation to their work. The insignificance of time culture refers to the individual's relaxed attitude regarding his work (Kwong & Levitt, 2009). This finding contradicts what was discussed above about the importance of time in Muslims' lives. However, it could be explained as Muslim healthcare professionals believing that by taking their time, they took an ethical decision because they want to dedicate their time to their patients, as they are their priority.

Our findings of threatening professional roles have revealed that the use of EHR has caused healthcare professionals in Saudi Arabia to have a hybrid role. A hybrid identity role happens when a profession has two identities with different instructions (Ogbanufe, 2020; Smith *et al.*, 2020). To illustrate, because of the role identity concept, which is a set of "meaning and expectations defined by social position in the social structure" (Ogbanufe, 2020), they consider themselves as healthcare professionals with a specific role, as discussed in the literature review section, such as the healing of their patients. However, when it comes to the Saudi Arabian healthcare professionals, because of the context and their collectivist culture, their role also is to act as part of the Saudi society and embrace their role also to God,

which their fellow Muslims expect, and which they expect of themselves as a self-concept. Hence, unlike individualism, their collectivist culture expects them to show care and empathy to others as part of this culture.

Therefore, our findings are partly consistent with the previous literature (Mishra *et al.*, 2012; Walter & Lopez, 2008; Abouzahra, 2014; Boudreau *et al.*, 2014). However, we extended the knowledge by looking into the Saudi culture and religion and how Saudi healthcare professionals as a people of faith and religion consider resisting the EHR system through *Ehtesab*, in which they have no fear of the consequence of system resistance because they believe they answer to a higher power (God). Hence, if they believe this will help them do their job to serve their patient better, they will resist the system, as we have seen.

Another interesting finding is how Saudi physicians engage in *Faz'za* behaviour to resist recording patients' information and protect it. Based on this finding, we could argue that the Saudi physicians' point of view about patients' information privacy influences their use of the EHR, hence, engaging in *Faz'za* behaviour. Villalba-Mora *et al.* (2015) and Tasi *et al.* (2020) showed that patients' privacy does not affect physicians' perception of the system and sharing of patient information, and they will still use it. Recent studies by Alshahrani *et al.* (2021) and Alzobaidi *et al.* (2016), conducted in Saudi Arabia, concluded that most physicians agree that EHR is safer than paper records, and the latter reported that 57% of the physicians in Saudi Arabia found the EHR system is secure. These results differ from the findings presented here.

Furthermore, our study found that physicians and nurses felt that the system made them more dependent on it, resulting in their role being threatened, as discussed earlier. However, we found that they felt the loss of their medical skills, and nurses reported an inability to perform their compassionate care. This result contradicts Alshahrani *et al.* (2021) and Upadhyay and Hu (2022) as their studies claimed that healthcare professionals are satisfied with the EHR system, which is helping them to deliver better care, specifically in the decision-making process. However, this does not reflect our findings, as they indicated that the EHR



system does not help physicians and nurses to facilitate better care quality for their patients by affecting their decision-making and clinical skills.

### 6.2.3 Resistance Due to Professional Autonomy Being Threatened

**Resistance due to professional autonomy being threatened** is the third theme generated from the data. Professional autonomy in this study refers to professionals having a guaranteed control over their work not only from their profession but also from the local society and culture. Four sub-themes were identified by both physician and nurse participants, and some reported the same concerns; those themes are *being denied access to the EHR, the EHR system limiting their professional authority as healthcare professionals, authority in terms of the Morafiq system, and professional autonomy causing negative reactions*.

*Being denied access to the EHR* is the first sub-theme physicians have reported. This means that healthcare professionals reported an inability to access the EHR system at the hospital. For instance, some reported that they *do not even have an EHR account on the system*, while others stated that *their account is a visitor<sup>29</sup> account*. Physicians' dissatisfaction regarding how the system limits their ability to do their job due to being denied access could be explained by the Saudi context and refers to justice or the concept of *Adl* (عدل). The concept of *Adl* in Islam means that there must be justice between employees of the same range or rank (Paramboor & Ibrahim, 2018).

In this research, *Adl* refers to how healthcare professionals feel about the EHR system causing injustice between them and their peers. Thus, being denied access to the EHR from the Islamic point of view could be referred to as a situation of injustice, and the concept of *Adl* plays a key role in ensuring that everyone in the organisation is treated equally (Paramboor & Ibrahim, 2018). Hence, Saudi physicians, who have this self-perception as the

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<sup>29</sup> A visitor account means that the professional does not have the ability to do their job, the system only allows them to view information, and if they want to view anything, they must make a request for it.

critical element of any hospital, will resist using the EHR system when they feel they are being mistreated.

The second sub-theme is that physicians and nurses expressed a shared concern about how the ***EHR system limited their professional authority as healthcare professionals***. However, both types of healthcare professionals (physicians and nurses) reported different concerns about how their authority has been affected. For example, physicians highlighted their dissatisfaction with *limited authority to prescribe medication or lab tests* and the need for higher approval (such as a consultant) to order a medical prescription for their patients.

Consequently, this resulted in their inability to help their patient and their resistance to the system via using their connections or *Wasta* to do their job. Physicians have also expressed that other health professional colleagues should not control them, even a consultant, because their judgment may be questioned, and they think they should have the autonomy to practice their profession. This is important for Saudi physicians because professional autonomy in their perspective includes seeing their decisions or their healing process as “unquestionable”, even among their peers (Alharbi *et al.*, 2019). Therefore, physicians stated that when they think the system is limiting their autonomy to do their role as a physician, they will resist it and not use it via *Wasta*, as we explained earlier, to get things done.

Nurses have also expressed reduced authority regarding medication prescriptions; however, they acknowledge that they should not have the authority to prescribe medicine, and some of them informed us they do not want this responsibility. Nevertheless, they feel they should be trusted and given the authority to ***prescribe during an emergency*** because nurses believe it is in the best interest of the patients. Nurses explained during interviews that they have been through situations where they must start giving the patient medication right away or it will threaten the patient’s life.

Threatening patients’ lives is not acceptable for nurses in Saudi Arabia, as when they treat the patient, they do not think about hospital policy, and they will break hospital policy to save the patient. This is related to how heavy the *Al-Amanah* feeling is and the responsibility

on their shoulders, which God placed on them to protect the patient. Hence, one of the nurses spoke out against their inability to prescribe during an emergency and described it as “*too much*” (H2N2). Thus, by not allowing nurses to prescribe during emergencies, they will break the chain of command, and instead of requesting from a physician to prescribe for their patient, they would engage in the *Et-Moone* behaviour of resistance and use their working relationships to resist the EHR system to help their patient.

However, despite saying how angry they are about the need for more authority, when asked whether they raised this issue with the department or the hospital (both physicians and nurses), both informed us that they did not raise the issue but instead would be engaged in resistance behaviour. This could be related to the ***Saudi Hierarchy*** culture, which is strictly hierarchical in nature (Alkahtani *et al.*, 2013). Also, it could be explained by the Power Distance index because Saudi hospitals have centralised management.

Therefore, the Saudis tend to be more respected in the chain of command, which in the healthcare context refers to “an authoritative structure established to resolve administrative, clinical, or other patient safety issues” (Authority, 2010, p. 4). Hence, what would be considered micromanagement by many Western organisations, such as those in the UK, would be perfectly normal in Saudi Arabia (Alkahtani *et al.*, 2013). Therefore, they prefer to engage in resistance behaviour and not have a direct conflict or contact with the management about this issue.

Nurses have also expressed other issues caused by the EHR system, such as ***losing their authority in terms of the Morafiq system***. This caused them to feel distrusted and unworthy. The importance of giving nurses the trust they deserve is that it will make a better working environment for the nurses and positively influence their patient care (Alayed *et al.*, 2014). This trust is crucial for nurses in Saudi Arabia, as they suffer from a poor image in Saudi society (Alsadaan *et al.*, 2020), and one of the reasons for this is that they are considered as physicians’ handmaids (Alboliteh *et al.*, 2017).

Therefore, these cultural and social factors could explain why Saudi Arabian nurses strive to gain and maintain a grip on power in hospitals in order to receive better treatment as healthcare professionals. Fundamentally, having a positive and flexible professional identity is critical for nurses to perform at a high level, as their patients would benefit from having a positive professional identity. Hence, nurses' perception of their competencies and professional selves are crucial to their positive performance achievement (Johnson *et al.*, 2012). Moreover, it has been argued that a lack of professional identity clarity has a significant impact on a profession's perceived value and on practitioners' confidence in advocating for their professional opinion (Matthews *et al.*, 2019), which we have seen in the present study.

The fourth sub-theme that emerged is losing ***professional autonomy causing negative reactions*** resulting from the abovementioned problem. These negative reactions have been expressed by nurses, such as the ***EHR system making them want to quit their professional work*** and ***change or modify their priorities*** at work to comply with what the EHR system is requesting.

Therefore, this shows how nurses feel about the EHR system and how dissatisfied they are with it. Nurses have expressed wanting to quit their job because of the system, which indicates that even with the resistance behaviour, the system still hinders this work. Hence, as explained earlier, when a professional is unable to perform his professional role, this will diminish his effectiveness and could cause the individual to lose the right to enact the role (Ibarra, 1999), thus resulting in what the data is showing, which is wanting to quit their profession.

Our findings here highlighted the resistance is due to professional autonomy being threatened, and this is partly consistent with the current literature about the importance of professional autonomy (Walter & Lopez, 2008; Stead *et al.*, 2011; Esmaeilzadeh *et al.*, 2015) and lack of control (Heath & Porter, 2019). However, their studies have been undertaken with a different HIS application and called to address the gap in understanding healthcare

professionals' views on the changing process (Heath & Porter, 2019) within a different context (Kumar *et al.*, 2020).

According to Esmailzadeh *et al.* (2015), professional autonomy in the literature has been explained from two perspectives, firstly, power, and they argue that professional power is a social reality that cannot be disputed. Secondly, it related to how professional autonomy is a professional ideal and related to the standard of excellence for each profession, such as nurses and physicians, and these professions include personal services that are marked by confidentiality. However, in Saudi Arabian healthcare professionals, data showed different explanations of professional autonomy. For example, healthcare professionals in Saudi Arabia view their professional autonomy as a responsibility given to them by society because of their knowledge as a physician.

Hence, our study extended the knowledge by looking at a different cultural context, and highlighted how, for example, physicians view the limited autonomy within medical prescription writing as a threat to their social status as a professional and their responsibility as physicians. This result is partly consistent with Dainty *et al.* (2012) as he found that a small number of physicians are using the EHR to prescribe medication for their patients, while other studies conducted by Crosson *et al.* (2011), Goldman *et al.* (2010) and Upadhyay and Hu (2022) claimed that using the EHR system to prescribe medication can contribute to the improvement of HIS and enhance patients' care quality, which does not align with our findings. Further, interestingly, in Saudi Arabia women need to have a *Morqifiq* with them, as discussed earlier, nurses highlighted that the system limited the ability that they used to have before. Hence, nurses expressed their resistance behaviour by using a physicians' account to request the *Morqifiq* letter.

#### **6.2.4 Resistance due to professional reputation damage**

**Resistance due to professional reputation damage** is the fourth theme that has been identified. Both types of participants (physicians and nurses) expressed their concerns about the damage the EHR system could cause to their reputation. Professional reputation relies

on the demonstration of “high standards of professionalism as well as behaviour, in general, that is consistent with responsible conduct that adheres to social norms and values” (Kirwan & Guckin, 2013, p. 48).

Therefore, in the professional context, reputation is strongly linked with the professional identity and character that nurses and physicians construct for themselves and transport into their work environment (Kirwan & Guckin, 2013). Hence, the basis of establishing a decent professional reputation is built on “honesty, trustworthiness and professional character” (Cournoyer, 2016, p. 24). However, in Saudi Arabia, reputation is essential not only professionally but also socially. Reputation has a high-stake value (Al-Dawood *et al.*, 2017) in Saudi Arabian society, and it is gained through a social network (Abosag & Naudé, 2014).

Furthermore, damage to the individual’s reputation will negatively affect his family/tribe. Therefore, healthcare professionals know they are responsible for maintaining their social and professional reputation, as they are linked together in a collective culture. In Saudi Arabia, physicians’ image is spotless as the Saudi society appreciates them due to their skills and role (Gallagher & Searle, 1985) and healthcare professionals are determined to protect this image. Thus, within the study context, professional reputation refers to the high standards of professional and social values expected from healthcare professionals in Saudi Arabia.

Three main sub-themes have been identified under this theme: ***the EHR system is causing tension between colleagues***; secondly, ***physicians abuse the system*** and finally, the ***fear of losing face***. We will start with the EHR system causing tensions between colleagues, a sub-theme reported by both physicians and nurses, but with differences regarding how it causes tension or the types of tension the system causes.

Causing tension between colleagues in this study refers to how the EHR system is seen as one of the main reasons for problems between healthcare professionals. For example, physicians reported that they would resist the system and not use it to write their own

medical judgment/diagnosis in the EHR system for the patient, even if they think of it as the proper judgment. In addition, residents and fellow physicians have reported this resistance behaviour towards the EHR because tensions could be caused by an incorrect *medical plan being documented on the system*.

To illustrate, a resident participant told us about her experience with the EHR system and how it caused tension between her and the consultant, who in this case was her supervisor. The resident made a medical judgment and documented it on the EHR system, as physicians are requested to do. However, the medical judgment was eventually deemed to be wrong, and the consultant (her supervisor) got upset and shouted at the resident that it was her fault and accused her of subverting her reputation as a consultant. The consultant informed the resident that she must delete her name (the consultant's name) from the medical judgment on the EHR system to protect her medical reputation.

Hence, she is now resisting the system and expressed that she is afraid to write anything on the system because of her worries about the consultant's reaction and bullying, and how it might cause tension with her supervisor. Thus, the resident preferred engaging in resistance to the EHR system rather than facing the consultant. This could be explained by the fact that Saudi Arabian culture promotes the avoidance of confrontation and conflict, and dignity and respect are the main qualities that influence their behaviour (Alkahtani *et al.*, 2013).

In addition, not using the system is also related to the uncertainty-avoidance culture (Goby *et al.*, 2016) that we discussed earlier; hence, by doing that, they believe they are protecting their face and respecting others by not having to get into a conflict. This is because values such as reputation and saving face are firmly embedded in the Saudi Arabian culture. Hence, individuals must show their loyalty by meeting the expectations not only of their family/tribe but also organisational expectations and requirements (Clarke *et al.*, 2022). This cultural behaviour reflected the resident's preference to resist the system rather than having a direct conflict with their superior that might result in an unwanted situation.

Therefore, while losing face is an issue in most cultures, it becomes more critical in a collectivist culture such as that in Saudi Arabia, because “Collectivists tend to have an interdependent view of the self, which fosters sensitivity to the needs of others and, at the same time, a need for sensitivity from others” (Goby *et al.*, 2016). Thus, as we saw, physicians stopped using the EHR system to avoid having conflicts with their colleagues.

Furthermore, high-ranking physicians use the EHR system to include low-ranking physicians in **personal conflicts**. This happens when a physician has a personal conflict with another physician colleague, and then they would request lower physicians (under his supervision) to ignore the EHR system and the medical recommendations made by the person he is in conflict with. This could be explained because the Saudi context promotes confrontation avoidance (Bjerke & Al-Meer, 1993; Alkahtani *et al.*, 2013). Further, they prefer not to show their emotion in public (Goby *et al.*, 2016); hence, instead of arguing to solve their problems, they will abuse their power over other physicians to include them in the conflict by resisting use of the EHR system.

Furthermore, one of the nurses has reported that the **EHR system is damaging nurses’ professional relationships with physicians and their professional image**. Nurses link this relationship damage to the EHR system, which limits their authority. Thus, they expressed their frustration by taking some of their roles as a nurse (e.g., specific lab results, requesting dental clearance) and the need to do it now through making a formal request from physicians, while nurses believe it is initially should be part of their role.

Therefore, they will resist the EHR system by using their *Et-Moone* relationship to use the physician’s EHR account (which is illegal) or contact the physician from the WhatsApp application or contact him by phone to do her job. According to the nurse, she now needs to contact the physicians in every detail to do her job, which is not a professional way to work. Hence, this results in causing tensions, as physicians are upset about how often this nurse is requesting things; they must request to do their own job.



Therefore, having to work in this unprofessional way will affect nurses' professional reputation and might damage their personal relationship with the physician, as one of the nurses indicated that they must keep "nagging" physicians to do things. Thus, poor information sharing with the nurses or difficulty fulfilling their role as a professional nurses will affect the care process (Cross *et al.*, 2018) and, as discussed, will lead to resistant behaviour from the nurses.

Furthermore, nurses have expressed concern over how physicians abuse the system by putting orders in the CO while knowing that the nurse cannot see that order at this specific time. This action harms nurses' perception of themselves as a professional and their work, resulting in EHR resistance. Hence, despite their position, nurses consider themselves powerful actors in creating a safe environment and better patient outcomes (Alayed *et al.*, 2014), and should be treated as such.

Therefore, if this safe environment has not been set up for the nurses, then it might not exist for their patients. The resistance is because they believe that the physician is using their power to hurt their professional reputation as a nurse. This could be related to the Saudi context, and it could be considered that physicians see nurses as less important professionally and socially (Alharbi *et al.*, 2019; Alobliteh *et al.*, 2017; Alsadaan *et al.*, 2021).

However, Saudi physicians' perception of nurses could be due to the nurse not being as highly educated (83% of the nurse workforce in Saudi Arabia hold a two-year diploma) (Alobliteh *et al.*, 2017), compared with how physicians are highly educated, and that they have a reduced salary compared to physicians (Alsadaan *et al.*, 2021), and less autonomy at work (Van Der Cingel *et al.*, 2021). Therefore, as explained before, when professionals perceive their role either positively or negatively, it will essentially influence their ability to provide safer and better-quality care for their patients (Smart *et al.*, 2014).

Another sub-theme reported by physicians and nurses is a ***fear of losing face***, which refers to not having or losing the dignity and respect from others (Alkahtani *et al.*, 2013). Physicians have reported a fear of losing face as they are afraid of making medical errors and entering

a wrong medical request into the EHR system with no clear path to fix this mistake if required. Therefore, medical errors mean that the administration will investigate them, resulting in conflict and reputation damage, which causes loss of face. This is unacceptable in the Saudi Arabian culture since it promotes confrontation and conflict avoidance, and dignity and respect are the main qualities that influence behaviour (Alkahtani *et al.*, 2013), and this culture plays a significant role in forming Saudi physicians' way of thinking, feeling and acting (Alexander *et al.*, 2016).

As a consequence, for the consultants to avoid medical errors, they are resisting the EHR system by ***abusing their power to avoid medical errors*** and forcing lower-ranked physicians to write the medical judgment on their accounts. This is done to prevent potential damage to their reputation and loss of face from happening. In Saudi Arabia, medical errors cause the feeling of shame and professional incompetence, which the culture of blame in Saudi Arabia is the main driver for this feeling (Alsafi *et al.*, 2015).

Therefore, due to the fear of medical errors and being blamed when things go wrong, some Saudi Arabian consultants abuse their power to make low-ranking physicians write the medical judgment on their (the consultant's) EHR system. This behaviour could also be related to the Saudi Arabian culture and how Saudi individuals are raised to respect the older person, in this case, a consultant (the consultant acknowledges this fact), and the Saudi culture helped them to engage in this resistance behaviour towards the EHR.

Hence, despite the hospital policy being on their side, to save face and not have a confrontation, they will not oppose it. In Arabic culture, saving face is much more important than in Western culture (Feghali, 1997). To illustrate, when a direct response or interaction is considered embarrassing or distressing, individual Arabs will try to avoid this by agreeing or being pleasant. At the same time, Western societies tend to express their ideas clearly, even if it can lead to an uncomfortable situation (Feghali, 1997). Therefore, this could explain a low-ranking physician being agreeable to a high-ranking consultant.

Additionally, nurses have also expressed fear of losing face over ***recording wrong information that could not be corrected on the EHR system***, which leads to resistance behaviour. This can have a very damaging impact on both physicians' and nurses' professional reputations. Healthcare professionals perceive medical errors as a threat to their identity because medical errors are incongruent with their professional ideals (Van Os *et al.*, 2015). As such, damage to their professional's identity will cause a loss of face and reputation, and eventually low self-perception. Reputation is more than functional competence, it has a moral dimension, and this is because everyone can improve his performance of a role or a task by developing skills and knowledge. Hence, it is difficult to recover from a moral lapse, particularly if that is associated with one's role performance (Kirwan & Guckin, 2013).

***Privacy concern for their personal information*** has been reported by physicians who are engaging in resistance behaviour towards the EHR system via not recording their own medical information for the fear of an information leak. This could be explained as a cultural factor and, as discussed before, Saudi culture prefers privacy, and sensitive cultural or religious information could impact them as professional physicians due to their social prestige. Therefore, they prefer to be treated in a different place or hospital because they fear losing face in front of their colleagues, they informed us. They also do not let their relatives be treated in the same hospital they work at, and if they are treated there, they will not record their information on the system, as explained before.

Our study confirmed that professional reputation damage has emerged as one of the healthcare professionals' concerns, and it is important and tied into identity because reputations are built over time by constructing a strong foundation of values and ethical practices (Huang-Horowitz & Freberg, 2016). Hence, healthcare professionals in Saudi Arabia engage in resistance behaviour to protect their professional and cultural reputation from being damaged by resisting the system to not engage in conflict with their colleagues and to save face.

The study findings interestingly have revealed that the system, instead of improving communication between healthcare professionals, is the cause of conflict between colleagues, as some have reported. Our findings are partly consistent with the current literature, where the use of the system by a healthcare professional depends on reinforcing their identity or examining threats to their identity (Mishra *et al.*, 2012; Hsieh & Lin, 2018; Lapointe & Beaudry, 2014).

However, our findings have illustrated in-depth what could threaten their reputation and identity and how they might react in a country like Saudi Arabia. These results differ from a recent study by Fotsing *et al.* (2021) which used a survey to examine a HIS application on healthcare coordination. Their result shows that mobile health technologies can strengthen the collaboration between healthcare professionals and provide quality care for the patient. A further recent study by Upadhyay and Hu (2022), which aimed to address the healthcare professionals' experience using EHR, concluded that EHR helped them to improve their communication with each other.

Hence, that would have an impact on their reputation through conflict within the team when one of them records, for example, an incorrect management plan, which leads to medical errors, or they do not use the system so it cannot record their medical errors or incorrect medical judgment and also, being used in personal conflict within colleagues as discussed. However, our findings around the effect of medical errors on reputation identity contradict Kaldjian *et al.* (2008) as their results clearly state that healthcare professionals would be happy to inform others about their medical errors and discuss them. They also indicated that they sought to be role models when informing other colleagues about their medical errors, which the Saudi physicians would not consider doing.

However, resistance due to reputation damage could be understandable because it has been suggested that public opinion about healthcare professionals is an essential factor in reputation damage (Sun *et al.*, 2021; Qiao *et al.*, 2021). Hence, this could be explained from a cultural perspective, wherein a country with a culture such as Saudi Arabia avoids the loss

of reputation and social status that follows their reputation in a culture that guarantees superiority to healthcare professionals.

### 6.3 How can the Use of EHR Influence the Relationship between Patients and Healthcare Professionals in Saudi Arabia?

So far we have found, investigated and understood from the first research question the influence of the EHR system on Saudi Arabian physicians’ and nurses’ identities. The second research question clarified how professional identity could explain resistance and the Saudi cultural role in EHR resistance, answering the calls to get a better understanding of healthcare professionals’ resistance to EHR (Kumar *et al.*, 2020; Mishra *et al.*, 2012) in a Saudi Arabian context (Alanazi *et al.*, 2019). Nevertheless, many studies called to investigate and deeply understand the impact of EHR on users, such as the relationship between healthcare professionals and their patients, due to a lack of studies in this area (Bardhan & Thouin, 2013; Morgan, 2016). Hence, we will answer RQ3, which is *How can the use of EHR influence the relationship between patients and healthcare professionals in Saudi Arabia*, with table 6.3 representing our sub-questions and research objectives.

Sub-questions	Research objectives
SQ3-1: How does the EHR system influence the relationship between patients and healthcare professionals?	RO3-1: To investigate and understand how the EHR system can impact the relationship between healthcare professionals and their patients
SQ3-2: How can the use of EHR influence the communication between healthcare professionals and their patients?	
SQ3-3: How have communications been affected and why?	

**Table 6. 3** Sub-questions and Research Objectives Related to RQ3.

Our study found that using the EHR system dramatically impacts the relationship between the two main end-users (healthcare professionals and patients). For instance, the study uncovered that healthcare professionals, especially physicians, are now depending and

interested more in the EHR system, rather than what their patients are saying. This eventually impacted their patient satisfaction, as we will discuss in detail in this section.

### **6.3.1 Change in Healthcare Professional and Patient Interaction and Communication**

The change in healthcare professionals and patient interaction and communication refers to how the EHR system alters the relationship between the two parties. For instance, physicians reported that they *depend more on the system than on what their patient says*. Nurses have also noted that the *EHR system is causing a communication gap between physicians and patients*, which we have not heard from the physicians.

This has been reflected in their resistance to the EHR system, making them more dependent on it. Hence, it has resulted in patient-physician interaction and communication changes, which will not benefit the healthcare professionals and their patients. The change is driven by low communication between patient and physician and how the interaction happens. To illustrate, physicians are now, instead of asking their patient questions about what the patient feels, they are asking yes or no questions, which are directly taken from the EHR system to fill in the blanks. These might not be related to the patient's situation.

Therefore, this has changed how healthcare professionals interact with their patients and reduced their time with them, resulting in less effective interaction between the two parties. Because the effective patient-physician interaction is a central clinical function in building a solid relationship between the patient and physician, delivering high-quality healthcare, and patient satisfaction<sup>30</sup> (Ha & Longnecker, 2010), this issue becomes vital in contexts such as in Saudi Arabia. Hence, because of this negative impact, some healthcare professionals are resisting the system.

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<sup>30</sup> Patient satisfaction refers to the "attitudinal response to a value judgment that patients make about their clinical encounter" (Jackson *et al.*, 2001, p. 609).

In Saudi Arabia, effective communication is important for physicians, because in order to establish a relationship with their patients, they must first gain and develop trust between them and their patient. This is vital because establishing a personal relationship is an essential component of any successful interaction in Saudi Arabia (Goby *et al.*, 2016). Accordingly, this theme could be explained by context, as Arabic culture is a personal interaction-driven culture (Zakaria *et al.*, 2003), and physicians understand that since they are from the same culture, which results in their resistance to the EHR system.

As a Saudi healthcare professional, spending time with the patient is vital because, in Saudi culture, people need to know about the person to conduct a meaningful conversation (Goby *et al.*, 2016). Hence, without this trust, a healthcare professional would be unable to perform their job to the highest quality, and their patient will be dissatisfied. Thus, communication and interpersonal skills encompass the ability to gather information to facilitate accurate diagnosis, counsel appropriately and establish a caring relationship with patients (Ha & Longnecker, 2010; Goby *et al.*, 2016). On the other hand, less communication will result in a lack of interaction with the patient, a lack of the patient's satisfaction and a lack of quality care. Thus, Saudi physicians would resist the change to the EHR system, as their primary goal is achieving the best outcome for patient care delivery.

This analysis confirmed that the use of EHR has influenced the relationship between patients and healthcare professionals. It has changed it in terms of making physicians not listen to what the patient is saying about themselves or why they came to the hospital in the first place; instead, they only look at the screen (e.g., vital signs) to determine why they are sick. Therefore, they engage in resistance behaviour to protect this relationship. Our findings here are similar to Aldraehim *et al.*'s (2013) regarding how Saudi people would like to have face-to-face contact. Additionally, Martin's (2008) and Diment and Garrety's (2011) studies found that healthcare professionals are more satisfied with spending more time with their patients than on screen.

### 6.3.2 Patient satisfaction

**Patient satisfaction** is the second theme and, in our study, since it concerns the cultural aspect of the system's influence, it refers to patients' preference for their cultural and religious needs to be met along with their medical needs as a patient. This theme could be seen as the result of the above theme due to the reduced communication between healthcare professionals and their patients. In addition, many sub-themes were identified as those nurses reported: how they are *forced to satisfy the system over their patients*, and their *compassionate care identity is being affected*. Further, physicians and nurses reported that this has resulted in *reduced patient satisfaction*, which will be discussed in the following paragraphs.

The nurse participants explained how they are now forced to satisfy the system instead of their patients. System satisfaction is now deemed more important than patients, who should be the core clinical skill in medicine, with the ultimate goal of achieving the best outcome, and the relationship with the patient is essential for effective healthcare delivery (Ha & Longnecker, 2010). Patients reporting good communication with their healthcare professionals are more likely to be satisfied with their care, especially to share pertinent information for accurate diagnosis of their problems, follow the advice and adhere to the prescribed treatment (Ha & Longnecker, 2010).

Furthermore, our data have also proven that nurses care more than physicians regarding compassionate care, which is considered one of the main components of professional nursing practices (Apker *et al.*, 2006). This has been acknowledged as *nurses' compassionate identity care is affected by the EHR system*. This is important because having a successful professional identity for a nurse includes being compassionate to their patient (Apker *et al.*, 2012), and the system, as we have seen from the participants, is challenging this role for the nurses. The compassion identity of nurses can be seen as the nurse's perception of themselves as having a caring personality among healthcare professionals.



Compassion identity is vital, as it is a way for nurses in Saudi Arabia to show their understanding of their patients' needs as Muslims and respect their wishes regarding their cultural and religious views. Further, it is a way for nurses to show their understanding of their patients' pain, and this compassion is exclusive to healthcare professionals (Coros, 2012). Hence, developing the awareness of compassion identity led to a better outcome with patient care (Coros, 2012), and any threat to that will be met, as we have seen, with resistance to the EHR system. This is because when professionals are not genuinely available to their patients, professional identity cannot be fulfilled, and the professionals cannot fulfil their fiduciary promise to them (Austin *et al.*, 2009).

However, as explained in the Findings Chapter, lack of compassionate care and the ignorance of patients' needs resulted in ***reduced satisfaction among patients***, and both types of healthcare professionals reported it. As a result, many physicians and nurse participants expressed how the EHR system is taking them away from the patient, changing their interaction style, and limiting the time they spend and need to spend with their patients to gain their trust and develop a personal relationship.

Nurse/patient interaction is at the heart of the caring relationship (Hewison, 1995) which has become vital in Saudi Arabia, as we have explained earlier, noting the importance of face-to-face communication. Nurses and patient interaction can be referred to in this study as the nurse focusing on gaining the trust and building a relationship with the individual receiving care. Hence, effective communication between a patient and their physician/nurse is a clinical need in order to build a solid relationship between the healthcare professional and patient for high-quality care and patient satisfaction.

Furthermore, Saudi physicians believe the sub-EHR system, called Sihaty, developed by the MoH in Saudi Arabia, is one of the causes of the interaction change between physician and patient. Physicians are upset about how the Sihaty application drives the patient to change their interaction with their physicians. Healthcare professionals have a sense of uniqueness (Van Maanen & Barley, 1984), especially Saudi physicians, because their expertise and knowledge make them more respected in society. Therefore, not expressing this uniqueness

might threaten their professional sensibilities. Thus, our interviewer has expressed his feeling about how the Sihaty application caused this change and undermined his professional identity by causing the change in the relationship dynamic with the patient.

This result confirmed that healthcare professionals would engage in resistance behaviour towards the EHR system to protect their role and satisfy their patients. We have also found that healthcare professionals feel the system now makes them have less interaction with their patients and results in their patient's frustration during the consultation. Hence, they will resist the system when this happens. This has been supported by a recent study from Beglaryan *et al.* (2017) and Alanezi (2021) concluded that patient influence has a direct effect on the behavioural intention to use the EHR, and Noblin *et al.* (2013) reported that face-to-face communication is now reduced during the consultation time, while Boonstra *et al.* (2022) reported more specific communicational change between patients and physicians and described it as more formal and bureaucratic communication. However, these studies have not investigated why healthcare professionals would engage in resistance behaviour towards the EHR system, and the ones that asked the 'why' question had different reasons for doing so compared to what our study presented.

On the other hand, two studies were done by Rotich *et al.* (2003) and Upadhyay and Hu (2022) which found that healthcare professionals believe that EHR helped them to spend more time with their patients. Freeman *et al.* (2009) and Baudendistel *et al.* (2017) concluded that the implemented EHR system has improved the quality of patient care, and Zanaboni *et al.* (2020) reported the EHR system improved communication between healthcare professionals and patients. However, our study does not support that result, as we have confirmed that patients are not satisfied and do not hesitate to show their frustration in front of their healthcare professionals. This contradiction could be explained by the contextual factor in which Saudi Arabians prefer face-to-face interaction, as they see it as a sign of respect to look at someone while they are talking to you (Feghali, 1997; Mebrouk, 2008).

## 6.4 Chapter Summary

The main aim of this chapter was to critically analyse and discuss the outcome of the analysis of the previous relevant literature. This chapter analysed the findings, which helped to answer our research questions. Section 6.1 answered our first research question and objectives and concluded that factors such as a change in healthcare professional's work outcomes, professional values, professional uncertainty and restructuring of professional roles have a vital influence on Saudi healthcare professionals' professional identity.

Section 6.2 answered our second research question and achieved the question's objectives. The second question aimed to extend understanding of the situation concerning the EHR and Saudi healthcare professionals by how the influence and change of professional identity can explain Saudi healthcare professionals' resistance. The present study findings confirm that contextual factors are strongly linked and contribute to the resistance to change regarding the EHR among Saudi healthcare professionals (Figure 6.7). Further, some of the interpreted cultural behaviour could explain multiple themes (Table 6.4).

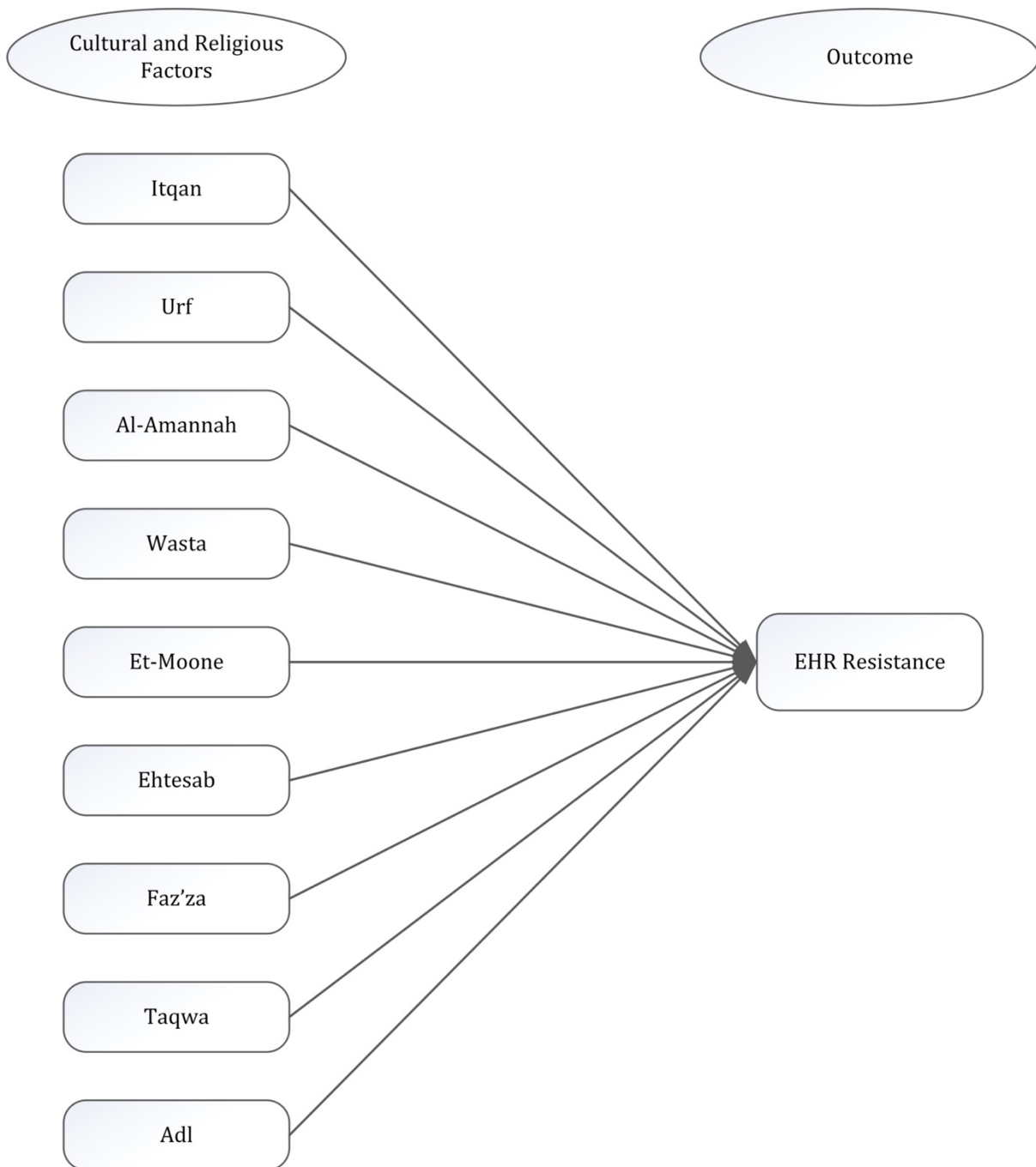
Finally, section 6.3 argued the importance of investigating the changes in Saudi healthcare professional practices because of the EHR implementation, and more importantly, the shift between patient and healthcare professionals' relationship, which the EHR literature on EHR implementation failed to recognise (Morgan, 2016; Kumar *et al.*, 2020). Hence, this section has answered the third question and found that the EHR system impacts healthcare professionals' relationships with patients.

Our Findings	Previous Studies		The Differences Between Our Findings and Previous Studies
	Support	Contradict	
<b><u>RQ1</u></b>			
EHR system negatively influenced healthcare professionals' identity		(Villalba-Mora <i>et al.</i> , 2015; Bawac & Kamdjoug, 2018; Chen <i>et al.</i> , 2021)	Our study contradicts previous studies and finds that EHR influences professionals' performance and work outcomes and not improving their self-perception as healthcare professionals.
EHR system negatively influences healthcare professional values	(Nilsson <i>et al.</i> , 2018)		Our study differs from previous studies which highlighted the importance of professional values, yet, not explicitly mentioning what are these values. Our study found values such as Itqan and protecting patients' sensitive information.
Healthcare professionals protect patients' information		(Anderson & Agarwal, 2011; Samsuri & Ismail, 2013)	Our study contradicts the previous one which concluded that healthcare professionals would give access to their patient's information. Further, patients are more open to disclosing their information when having negative emotions, and the more educated people are the more open to sharing information.
EHR changes healthcare professionals' role		(Alexander <i>et al.</i> , 2017; Cresswell <i>et al.</i> , 2017)	Our study found that EHR promotes nurses' professional identity and diminishes physicians' professional identity.
Physicians' professional identity threatened	(Mishra <i>et al.</i> , 2012; Hsieh & Lin, 2018; Esmaelizadeh <i>et al.</i> , 2015)		Previous studies did not specify what aspect of their professional identity has been threatened. Our findings specifically found Itqan's identity threatened.

Healthcare professionals in Saudi Arabia do not have autonomy more than their patients in data recording		(Al-Eraky, 2014)	A previous study concluded that healthcare professionals in Saudi Arabia have more autonomy than their patients. However, our study contradicts this conclusion.
EHR system influences healthcare professional identity by causing uncertainty	(Khanum <i>et al.</i> , 2012; Alsswey <i>et al.</i> , 2018; Draus <i>et al.</i> , 2019)		Previous studies have been done with a different application and have not specified how it can influence their professional identity.
<b><u>RQ2</u></b>			
Social factors such as religion and culture cause EHR Resistance	(Boudreau <i>et al.</i> , 2014; Samhan & Joshi, 2014)	(Jeng & Tzeng, 2012; Alhirz & Sajeev, 2015)	Studies supporting our findings have not considered a cultural and religious influence on social factors.  While contrary studies suggested social influence does not impact medical professionals.
Physicians perceive EHR implementation as a personal and professional benefit		(Mosse & Byrne, 2005; Bernardi & Sarker, 2013)	Our findings perceive the system as a threat to their personal and professional power.
System integration causes resistance to EHR		(Upadhyay & Hu, 2022)	Our findings showed that EHR integration is not welcomed and will be resisted, while other studies showed that integration is needed, and lack of integration would cause the resistance
Use of EHR threatens the professional role	(Mishra <i>et al.</i> , 2012; Biudreau <i>et al.</i> , 2014)		Our findings partly align with the previous literature; however, we advanced the literature knowledge by looking into Saudi culture and religion and recognised a specific factor (e.g., Ehtesabh).
Governmental pressure is not stronger than the Saudi Arabian healthcare professional identity		(Mishra <i>et al.</i> , 2012)	Our study found that professional identity is stronger with cultural and religious identity, despite governmental pressure (e.g., HIV recording).

Privacy concerns caused Saudi healthcare professionals to resist EHR		(Tasi <i>et al.</i> , 2020; Alshahrani <i>et al.</i> , 2021)	Our findings showed that Saudi physicians engage in a specific cultural behaviour called Faz'za to protect their patients' privacy.
Medical skills loss		(Alshahrani <i>et al.</i> , 2021; Upadhyay & Hu, 2022)	Previous studies indicated that healthcare professionals are satisfied with the EHR system and help to deliver better care service. Unlike our findings indicated it causes medical errors and loss of their medical skills.
Professional autonomy threatened	(Esmaelizadeh <i>et al.</i> , 2015; Heath & Porter, 2019)		Previous studies were conducted with different IS and HIS applications and context. Further, we identified another perspective of professional autonomy not discussed in the literature which is responsibility.
Fear of professional reputation loss due to medical errors in registration		(Kaldjin <i>et al.</i> , 2008)	Our findings showed healthcare professionals would resist the EHR to not record medical errors.
Causing conflict between healthcare professionals due to a lack of communication		(Forsting <i>et al.</i> , 2021; Upadhyay & Hu, 2022)	Unlike previous studies, our findings showed that EHR does not improve communication between healthcare professionals.
<b>RQ3</b>			
EHR system reduced communication between healthcare professionals and patients	(Beglaryan <i>et al.</i> , 2017; Alanezi, 2021; Boonstra <i>et al.</i> , 2022)	(Upadhyay & Hu, 2022; Zanaboni <i>et al.</i> , 2020; Baudendistel <i>et al.</i> , 2017)	Previous studies that are similar to our findings have not investigated 'why' healthcare professionals would engage in resistance behaviour towards the EHR system. Our study specifically found that cultural reasons are behind the resistance behaviour.  The contradictory studies could be explained by contextual factors, as Saudi Arabians prefer face-to-face interactions.

**Table 6. 4** A comparison summary of the study findings with the previous literature.



**Figure 6. 7** Model summarises the key findings of the cultural/religious contributions to Saudi healthcare professionals' resistance to EHR change.

<b><u>Major Theme</u></b>	<b><u>Sub Theme</u></b>	<b><u>Cultural Behaviour</u></b>
<b>EHR system's influence on healthcare professional work outcome</b>	Making job harder	<i>Itqan</i>
	Unavailability of hard copies of patients' information	
	Clinical skills being affected	
	Giving the wrong indication about patients' condition	
	Medical judgment affected	
<b>Healthcare professional values are affected negatively</b>	Effectiveness	
	Patient satisfaction is affected	
<b>Internal professional identity conflict</b>	Not in favour of integrating the EHR system with other hospitals	<i>Urf</i>
<b>Internal professional identity conflict</b>	Not recording medical information that could be harmful to the patient	<i>Al-Amannah</i>
<b>Internal professional identity conflict</b>	Use their colleague's EHR system account	<i>Wasta</i>
	Getting things done	
	Not recording relative's information	
<b>Internal professional identity conflict</b>	Using Et-Moone to share their EHR's password account	<i>Et-Moone</i>
	Protect relative's sensitive information by deleting it or changing it	
<b>Resistance due to professional role threatened</b>	Healthcare professional performance	<i>Ehtesab</i>
<b>Resistance due to professional role threatened</b>	Purposefully abuse the system by documenting wrong information on the EHR system to protect fellow Muslim	<i>Faz'za</i>
<b>Resistance due to professional role threatened</b>	Surveillance tool	<i>Taqwa</i>
<b>Healthcare professional autonomy threatened</b>	Denying access to EHR	<i>Adl</i>

*Table 6. 5 This table shows cultural behavioural in an Arabic term, which explains multiple resistance phenomenal during the study.*



# Chapter 7

## Conclusion and Contributions

Understanding healthcare professionals' resistance to EHR is essential. Despite the growing attention to understanding EHRs and their end-user behaviour, there is still a lack of studies to investigate healthcare professionals' resistance. To illustrate, previous studies indicated that the EHR and resistance to change field is lacking a deeper theoretical lens, and needs to introduce other theories beyond what is in the EHR literature in order to understand the change process (Holmström, 2018).

Hence, identity theory was suggested to better understand the EHR resistance phenomenon (Nech, 2015; Minicuci *et al.*, 2020; Grossi *et al.*, 2021) because it could explain the complexity of human behaviour, and it has helped us in this matter. In addition, most of the previous research was done in developed Western countries, causing a lack of understanding in developing countries. This is important because professionals' behaviour could be shaped by the context in which they live and work (Roland *et al.*, 2011; Minicuci *et al.*, 2020), thus, the need to understand resistance behaviour toward change in developing countries such as Saudi Arabia (Alanazi, 2020) has never been more prominent.

This study has answered the research questions of why/how resistance behaviour towards EHR change occurs in Saudi Arabia. This was done by revealing how professional identity has been triggered by, for example, a threat to their role, and how their values influence when healthcare professionals use the EHR system. After that, we have shown that this influence will lead healthcare professionals in Saudi Arabia to resist the EHR system. Finally, we have linked those findings to how EHR use could contribute to the relationship change between patients and healthcare professionals.

Our research has, therefore, responded to the calls (Ajibade, 2018; Kumar *et al.*, 2020; Huang *et al.*, 2021), for the need to contribute to the EHR resistance literature through understanding factors such as culture, and the social environment in which the end-user is

embedded, as a critical aspect to understand the phenomenon (Davidson *et al.*, 2018). Our findings reveal that Saudi healthcare professionals evaluate the EHR system through various lenses: these are both cultural and religious. Hence, they consider these aspects when using the EHR system and use them as an excuse, and motives to resist the change to EHR use in hospitals.

Therefore, this chapter aims to conclude this PhD thesis by summarising the significant findings and identifying the main contributions of this research to the field. Accordingly, this chapter will begin by summarising the main findings for each research question; then, it will be followed by the theoretical, contextual and practical contributions. Finally, limitations and suggestions for further research are outlined.

## **7.1 Summarising Research Findings**

The main aim of this study was to explore in-depth how the professional identity of Saudi healthcare professionals explains resistance to the change to using EHR in public hospitals in a context where culture is considered a significant factor for individuals. The active use of EHR among healthcare professionals is essential for the successful implementation of an EHR system, and, consequently, better healthcare services. Therefore, this research focused on understanding better the EHR system's primary users, their perspectives about how the system influences their professional identity, and why their professional identity is vital in the EHR resistance context.

A review of the literature exposed the lack of studies to understand healthcare professionals' EHR resistance to change phenomenon in the developing countries, particularly Saudi Arabia (Aldosari, 2017; Alkhaledi *et al.*, 2020), while the Western studies appear to be dominating the field (Kumar *et al.*, 2020; Ogbanufe, 2020). Further, the literature failed to address the challenges from the professional identity theory perspective (Heath & Porter, 2019; Wyatt *et al.*, 2020) and its importance in gaining a deep understanding of the resistance phenomenon (Morgan, 2016), as EHR resistance literature research has ignored the psychological factors behind resistance to change (Hassandoust *et al.*, 2016). More

particularly, there has been a lack of the contextual professional identity perspective (Dadich *et al.*, 2015; Grossi *et al.*, 2021), as within a different cultures and settings, human behaviour changes which would not apply in other contexts (Davison & Martinsons, 2016).

Hence, failing to address the challenges that the Saudi healthcare sector encounters with EHR change and what the outcomes of these challenges (e.g., poor healthcare services, financial loss, the threat to the 2030 Vision) could lead to, encouraged us to develop our research questions and objectives around this problem. Therefore, this research has furthered our understanding of the EHR resistance to change phenomenon in Saudi Arabia by using professional identity theory and in-depth qualitative methods. Thus, the next section will summarise and address the significant findings of this research by answering the proposed three research questions.

### **7.1.1 RQ1: How does the use of EHR influence healthcare professionals' identity in Saudi Arabian public hospitals?**

RQ1 aimed to investigate why and how EHR use influences Saudi healthcare professionals' identity. This question is driven by the lack of research focus on the influence of technologies on healthcare professionals' identity (Lapointe & Beaudry, 2014; Chen *et al.*, 2021). Hence, our research found that EHR influences Saudi healthcare professionals' identity in the following ways: 1) changes in healthcare professionals' work outcomes; 2) affecting their professional values; 3) restructuring healthcare professionals' historic role; and 4) causing professional uncertainty due to the user interface design.

We have identified an essential factor influencing how healthcare professionals perceive the EHR system and, ultimately, themselves. *Itqan* has been seen as a significant religious influence on Saudi healthcare professionals, their use of the EHR system, and their perspective on how it has influenced their professional identity. To the knowledge of the researcher, this finding has not been previously reported in the literature. The *Itqan* identity motivates Saudi healthcare professionals to perform their best at work, including displaying resistance to the EHR, in exchange for God's rewards.

### **7.1.2 RQ2: How can a change in professional identity explain healthcare professionals' resistance in Saudi Arabia?**

After investigating and answering why and how the EHR influences Saudi healthcare professional identity, we sought to get a better understanding of professional identity and technology. Hence, RQ2 was developed and aimed to explore how a change in professional identity can explain resistance to the EHR among Saudi Arabian healthcare professionals. Several factors were identified that caused healthcare professionals to resist the EHR change, and these are: 1) internal multi-professional identity conflict; 2) professional role threat; 3) professional autonomy threat; and 4) professional reputation damage.

We have identified a novel and specific aspect of Saudi healthcare professionals' cultural identity that caused the EHR resistance, such as physicians using *Wasta* not to record relatives' information, or interestingly, nurses using another level of *Wasta, Et-Moone*, to pass over their account on the EHR system and use the physicians'. To the best of our knowledge, no previous research identified such factors or considered how the Saudi Arabian culture contributes to EHR resistance.

### **7.1.3 RQ3: How can the use of EHR influence the relationship between patients and healthcare professionals in Saudi Arabia?**

Understanding the influence of technologies on healthcare professionals' work outcomes is needed (Tomer *et al.*, 2022; Kumar *et al.*, 2020), particularly how it influenced the relationship between healthcare professionals and their patients due to a lack of studies in this area (Bardhan & Thouin, 2013; Morgan, 2016). As such, RQ3 aimed to understand the influence of EHR on the relationship between the two parties. Our findings found that the EHR system dramatically impacts the relationship by: 1) changing the communication interaction; and 2) influencing patient satisfaction with the healthcare process.

EHR has been seen to cause a communication 'gap' between healthcare professionals and patients by having physicians not listening to what patients are saying. This is because

healthcare professionals are now more dependent on the information in the system regarding the patient than what the patient says about how they feel. This is important because, in a culture where face-to-face contact is the main driver for people's behaviour and interaction with each other, the patient would feel less important, resulting in reduced satisfaction.

## **7.2 Research Contributions**

This section will highlight the contribution of this research to the existing body of knowledge theoretically, and practically. The literature review in Chapter 3 identified several gaps in the existing knowledge in the field. Hence, we will discuss how our study has helped address these gaps (Figure 7.1). This section is structured as follows: we first will address the theoretical contributions to our research, then move to the practical contributions.

### **7.2.1 Theoretical Contributions**

This research has advanced our understanding of professional identity theory and how we believe it can contribute to EHR resistance, however, in general, the IS literature ignored identity theory as a more profound lens through which to understand people's behaviour towards EHR (Nach & Lejeune, 2010; Stein *et al.*, 2013; Brown, 2017). This has been done by identifying factors that lead to healthcare professionals' resistance to the EHR system in the developing countries, and mainly focusing on Saudi Arabia, due to the limited studies regarding this part of the world (Aldosari, 2017).

The theoretical lens for this study is professional identity theory, which is "the individual's self-definition as a member of a profession" (Chreim *et al.*, 2007, p. 1517). Professional identity is found to be helpful in understanding and making sense of actions and behaviour (Gioia *et al.*, 2013) such as IS resistance (Gal & Kjærgaard, 2009). A key aspect of professional identity theory is the ability to influence how individuals claim purpose and meaning for themselves (Chin *et al.*, 2020), and are seen to be a primary motivator for behaviour (Carter & Grover, 2015).

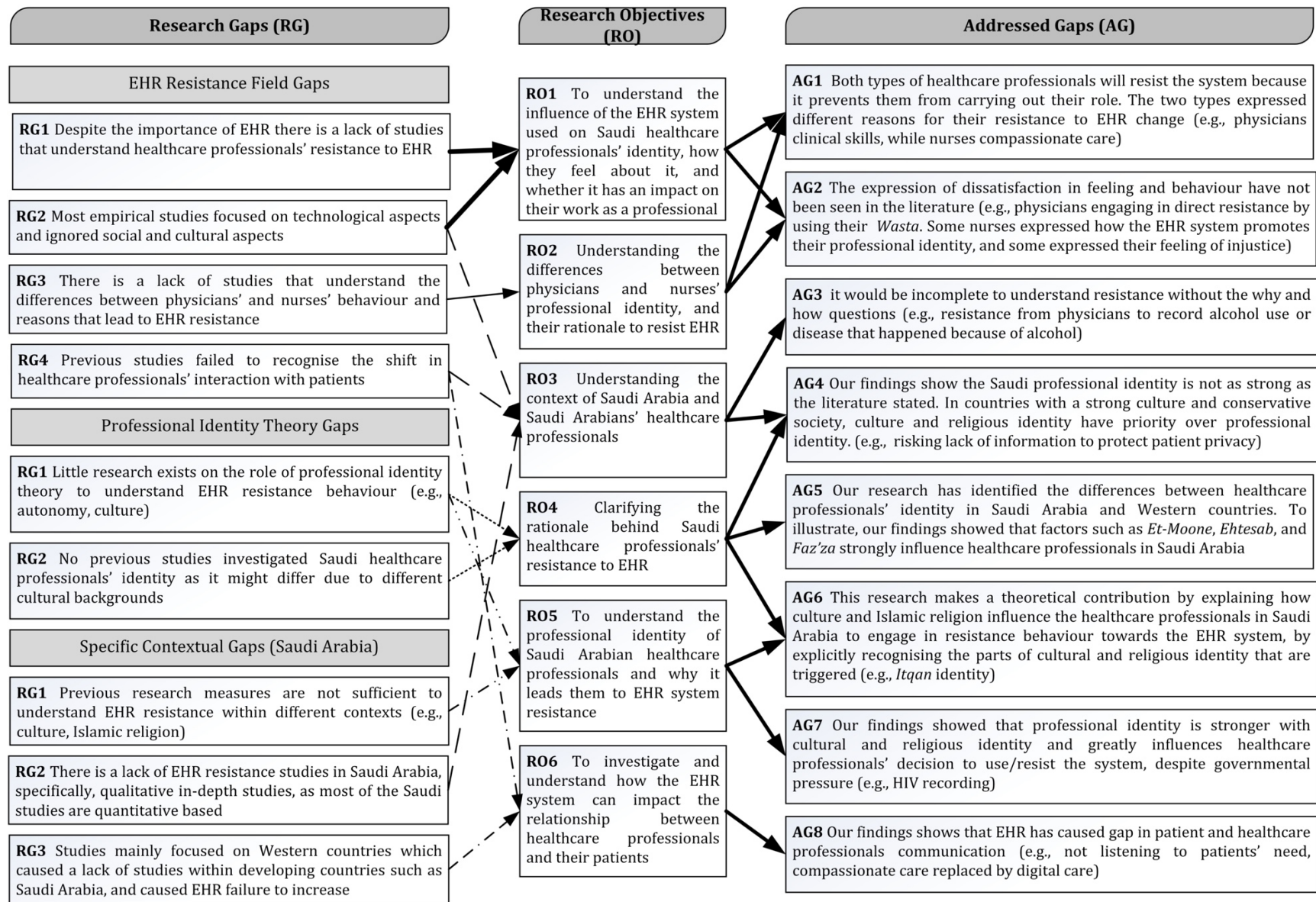


Figure 7. 1 Summarising key findings and how this research addressed our RO

Therefore, this study makes a theoretical contribution to the literature by addressing novel aspects of Saudi healthcare professionals' identity and explaining why healthcare professionals with strong cultural and religious backgrounds engage in resistance behaviour towards the EHR system. Further, it explains explicitly how professionals' culture and religious identity influence their perception of the EHR system and lead them to resistance behaviour. Therefore, our study makes a distinct contribution to the IS, IS resistance and professional identity literature in the following ways:

- **First**, this research went further and significantly contributed to identity theory by identifying a novel specific aspect of the three Saudi healthcare professionals' identities that play a significant role in their resistance to the EHR system: cultural, religious and reputation identity. In a collective society, such as the Saudi Arabian's, culture tends to influence the formation of an individual's identity (Karjalainen, 2020), and with time, it becomes the core of the individual's identity (Kim, 2007). To illustrate, we have identified that cultural, religious and reputation identities are part of the Saudi healthcare professionals' identity, as they live in a collectivist country that has strong religious and cultural traditions. For instance, a novel and specific aspect of cultural and religious identities identified in this study is the *Itqan* identity, in which a Saudi healthcare professional resists the EHR system to perform their best as they seek rewards from God. This spiritual act is becoming part of his professional identity as a Saudi healthcare professional. Therefore, in doing so, we are achieving our RO3 and 4, and are answering the calls to understand better the complexity of cultural identity and how it influences individuals and their behaviour (Karjalainen, 2020; Esmaeilzadeh, 2021). Consequently, this research makes a theoretical contribution to the literature by explaining how culture and Islamic religion influence the healthcare professionals in Saudi Arabia to engage in resistance behaviour towards the EHR system, along with explicitly recognising what part of cultural and religious identity could be triggered.
- **Secondly**, existing research on healthcare professionals' resistance to EHR change has primarily focused on developed countries rather than developing countries (Kumar *et al.*, 2020; Ogbanufe, 2020). This is the first study to assess professional

identity theory and how it can explain healthcare professionals' resistance to EHR in a developing country such as Saudi Arabia. Our research has identified the differences between healthcare professionals' identity in Saudi Arabia and non-Arab countries. To illustrate, our findings showed that factors such as *Et-Moone*, *Ehtesab*, *Taqwa* and *Faz'za* strongly influence healthcare professionals in Saudi Arabia, while none of these factors has been identified in Western countries' research. The importance of these factors lies in multiple suggestions from researchers to identify differences in identities within different contexts (Grossi *et al.*, 2021) and the achievement of RO4.

- **Thirdly**, the study has also found that because of their religious, cultural, and reputation identity, Saudi healthcare professional identity becomes stronger in front of governmental pressure, unlike Western healthcare professionals. To illustrate, this research contradicts Mishra *et al.*'s (2012) results concerning how healthcare professionals' identity is weaker when facing governmental pressure. Mishra *et al.* (2012) concluded in their study that governmental pressure will lead healthcare professionals to use the EHR system. However, in our context of the study, this conclusion has proven to be inapplicable in the Saudi Arabian context, despite the Saudi government's firm policy on the public hospitals. Our findings showed that professional identity is stronger with cultural and religious identity and greatly influences healthcare professionals' decisions to use/resist the system, despite governmental pressure. For instance, we have noted that internal conflict within the Saudi healthcare professional itself which leads them to exercise a specific cultural resistance behaviour such as *Faz'za* to not record information in the EHR system. According to our interviewees, it is mandatory for healthcare professionals to report HIV-positive patients and record them on the EHR system. However, this governmental pressure does not influence Saudi healthcare professionals, as, according to the interviews, they are purposefully not recording this information to protect patient privacy. This is a significant and a novel contribution to professional identity, as we found that because healthcare professionals in Saudi Arabia have multiple identities, their professional identity became stronger. As a result, this finding helped us to answer our RO3.



- **Fourthly**, our study made another specific contribution to professional identity's autonomy, and it is related to how Saudi healthcare professionals perceive their autonomy. To illustrate, our research confirmed that healthcare professionals in Saudi Arabia tend to have a higher professional autonomy than their peers in Western countries (Al-Eraky *et al.*, 2014), as studies such as Heath and Porter (2019) and Abouzahra *et al.* (2022) called for further research to understand how EHR might affect the professional autonomy of healthcare professionals. Further, despite confirming what Al-Eraky *et al.* (2014) claimed, yet, our research contradicts their conclusion that healthcare professionals in Arab countries have the upper hand than their patients in terms of making decisions regarding the patient, more than in Western cultures. Nevertheless, our research findings contradicted this notion and suggested that they do not have professional autonomy; particularly, we have identified less professional autonomy in recording patients' information. This is because cultural and religious factors have led healthcare professionals to decide not to write all patients' information down despite the importance of such information. Our findings showed that professional identity, specifically, Saudi healthcare professionals' autonomy is not as strong as the literature stated. In countries with a strong culture and conservative society, culture and religious identity have priority over professional identity. We can see that in how professionals risk a lack of information or critical information about the patient to protect patient privacy when they request from a healthcare professional not to record certain information. In addition, our findings show that social influence, such as socially taboo medical information (mental health etc.), is a powerful predictor for healthcare professionals in Saudi Arabia to resist using the EHR system. These above findings succeeded in answering our R04 and 5.
- **Fifthly**, this study has made a specific contribution to professional identity theory and Hofstede's theory of cultural dimensions by integrating both theories to gain a deeper understanding of the phenomenon. Hofstede's theory was found to have a significant influence on information system resistance (Vos & Boonstra, 2022). To illustrate, Alhirz and Sajeev (2015) highlighted that Uncertainty Avoidance (UA) does not influence Saudi people's resistance to the Enterprise Resource

Planning System (ERP). This result contradicts our findings, which found that UA is one of the main reasons healthcare professionals resist the EHR system. By doing so, we are answering the call to get a deeper understanding by utilising Hofstede's cultural dimension theory (Abubakre *et al.*, 2017a; Vos & Boonstra, 2022) and the suggestion of two theories to better understand cultural aspects and EHR resistance (Jackson, 2011; Kajol *et al.*, 2022).

- **Sixthly**, this study has furthered our knowledge and filled the gap regarding how individuals with professional identity behave around the EHR system, their feelings towards it and how it can influence their working environment. To illustrate, this study found that physicians' behavioural outcome was dissatisfaction; however, to the best of our knowledge, their expressions of dissatisfaction have not been seen in the literature. For example, physicians are engaging in direct resistance to the EHR system by using their social relationships (e.g., *Wasta*) as a tool to resist and justify their resistance to change. In addition, some nurses expressed how the EHR system promotes their professional identity, while some expressed their feeling of injustice when it comes to being treated fairly compared to other healthcare professionals in fulfilling their professional role as a nurse. Consequently, some nurses have expressed that the EHR system is causing them to think about quitting their careers due to their inability to perform their professional duties. These findings are significant; as Maillet *et al.* (2015) noted the lack of studies regarding the end-user behaviour towards the system and the need to understand it, and not ignoring the emotions and feelings factors, which could have an impact on the work environment. We also contributed to the literature by differentiating between physicians' and nurses' professional identities' perspectives on EHR resistance. For example, physicians resist the system because they believe it has negatively impacted their clinical and medical skills. Physicians view their medical skills as an essential part of their professional identity which makes them professionals (Pratt, 2006), particularly Saudi Arabian healthcare professionals, as it gave them a higher social status and influence in their society. In comparison, nurses are resisting the EHR system because they believe that one of their roles as nurses is providing compassionate care. This is important, especially for Saudi nurses, as compassion is part of their collectivist

culture, which reflects their cultural identity. Hence, both types of healthcare professionals will resist the system because it prevents them from doing their role. By doing so, we are answering the recent calls from Alohali *et al.* (2020) and Abouzahra *et al.* (2022) to understand the differences between physicians' and nurses' perspectives and behaviour towards the EHR system. In addition, we are also answering Kumar *et al.*'s (2022) recent call to understand why different healthcare professionals are practising different forms of resistance behaviour. These contributions helped us achieve our RO1 and 2.

### 7.2.2 Contextual Contributions

Another significance of this study is the context it is linked with, Saudi Arabia, as it has provided us with a rich understanding and a new insight into the context of EHR resistance. Therefore, the main argument of this research is that resistance to EHR change cannot be understood by only considering technical factors. Contextual factors can be seen as a solid force for the EHR resistance change. However, most of the empirical research about the professionals' resistance to the EHR system has been done in a Western context, as discussed earlier (Kumar *et al.*, 2020; Ogbanufe, 2020), and those countries have a strict separation between the state and religious affairs (Ogbanufe, 2020).

Further, to the best of our knowledge, no previous studies have utilised the identity theory perspective to understand the developing countries, particularly Saudi Arabian healthcare professionals' resistance to the EHR. It is crucial because this research has shown that professionals' identity reactions alter in different cultures and settings. In addition, the scarcity of literature on the EHR resistance to change in the Gulf Cooperation Council (GCC) region, especially Saudi Arabia, which Aldosari (2017) called for investigations to be undertaken on, is astonishing due to the significance of region. To illustrate, the GCC countries<sup>31</sup> are one of the fastest-growing regional economies in the world (Youssef *et al.*, 2021), and in the Middle East, with a GDP of US\$2 trillion in 2020 (Alkhaledi *et al.*, 2020). Saudi Arabia's GDP alone is responsible for approximately 50% of the total GDP among the GCC countries (Bijja, 2022) and more than 60% of these

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<sup>31</sup> Kuwait, Saudi Arabia, United Arab Emirates, Qatar, Bahrain and Oman

countries' populations. Saudi Arabia is also one of the G20, and it has a higher economic growth among the group (Papava, 2022).

In addition, along with the importance for Saudi Arabia to succeed in EHR change that was discussed in Chapter 3, several scholars suggested the significance of exploring the social and cultural norms that might lead to EHR resistance (Alkhaledi *et al.*, 2020; Borg *et al.*, 2022). As discussed in Chapter 3, the uniqueness of the society, which has been mainly influenced by the Islamic religion and plays a significant role in shaping peoples' cultural values (Harbi *et al.*, 2017), made it an important context to be understood (Alkrajji *et al.*, 2014). For example, unlike in Western countries, there is no separation between secular life and religious life in Saudi Arabia (Rice, 2003), and several studies have confirmed that fundamental human beliefs, values and behaviour vary significantly across societies, even among professions (Davison & Martinsons, 2016).

Therefore, our research is filling the literature gap to understand better the cultural and religious factors that could cause resistance to the implemented EHR system in Saudi Arabian public hospitals. Hence, to the best of our knowledge, the study is the first to utilise professional identity theory to understand EHR resistance in Saudi Arabia. In doing so, we are contributing to the literature via answering the calls to get a better understanding of healthcare professionals' resistance to EHR, and the reasons that impact it in a different cultural context, as they might differ (Alkrajji *et al.*, 2014; Mohamadali *et al.*, 2017; Kumar *et al.*, 2020). In addition, these findings contributed to our RO4, 5 and 6. The following paragraphs will discuss the main findings and contribution to the context:

- **First**, these research findings furthered our understanding when it came to answering what questions regarding social factors influence healthcare professionals' perspectives on the EHR. Samhan (2017) indicated that previous studies only considered workplace influence as the primary source of social influence, while other sources (e.g., family, culture and religion) remain ignored. In this study, we went beyond listing the social factors by identifying specific events and behaviour that could only relate to our study's context. On this basis, Saudi Arabia is a developing country with a strong cultural and religious

background. While society still greatly influences individuals, culture and religion have a vital role in Saudi healthcare professionals' perception of EHR. To explain, physicians expressed how they would not use the system to record their relative's information; this shows how physicians would act against the hospital to protect a family member. In comparison, nurses expressed using their *Et-Moone* relationships to delete their relative's sensitive information. These findings are essential, as they confirm and show how/why people in different countries use the EHR system in a certain way, and in Saudi Arabia family comes first. By doing this, we are answering the call to understand how professional identity theory can be used to explain resistance to the EHR system by healthcare professionals (Lapointe & Beaudry, 2014; Maillet *et al.*, 2015; Kumar *et al.*, 2020) in developing countries (Kumar *et al.*, 2020) and different professionals' cultures (Dadich *et al.*, 2015; Borg *et al.*, 2022). Further, we have answered the call to understand better why people use technology in the way they do (Carter & Grover, 2015; Morgan, 2016); however, you must first understand people's culture, to understand why they behave in a certain way (Rice, 2003), which is what this research has done.

- **Second**, the findings confirmed that understanding EHR resistance could not be complete without considering the context and cultural background. Our data analysis shows that cultural and religious norms greatly influence Saudi Arabian healthcare professionals' identity. Hence, it would be incomplete to understand why EHR system resistance behaviour occurs without understanding the context. For instance, resistance from physicians to record alcohol use or disease that happened because of alcohol, as well as not recording that there is a woman who has become pregnant outside of marriage, might not be understood effectively without considering the local context and Islamic tradition during analysis. As such, this study answered the call to understand contextual factors, as they are essential to the successful implementation of healthcare innovation, and such contextual factors are barely recorded, analysed, appreciated or considered when implementing change and specifically in research (Davison & Martinsons, 2016; Kumar *et al.*, 2020; Grossi *et al.*, 2021). Further, Davison and Martinsons (2016, p. 243) suggested that "contextual differences are significant in behavioural research", including IS research. Therefore, studies have called upon researchers

to investigate different contexts and cultures regarding identity (Esmailzadeh, 2021) because identities are vital to understanding resistance to EHR, and professionals' identity reactions could alter within a different culture and setting (Hasan & Dista, 1999; Bernardi & Sarker, 2013; Alkraihi *et al.*, 2014; Mohamadali *et al.*, 2017; Bernardi *et al.*, 2019).

### 7.2.3 Practical contributions

This research has a practical contribution and benefits the field by raising awareness regarding how culture, belief and religion could cause resistance to the EHR system. Further, its findings offer specific suggestions that could help to reduce resistance from healthcare professionals and could be beneficial for the following groups:

- ***First, hospital managers.*** The main practical implication of this study is that our findings suggested that hospital managers should consider healthcare professionals' concerns if the EHR system is to be successfully implemented. For example, privacy is a serious reason to prevent resistance to the EHR system. As discussed earlier, medical information is considered to be very private to the Saudi people; hence, physicians resist the system and are not recording this information, despite its importance. Therefore, some physicians have suggested that this sensitive information that could hurt the patient could be coded or only received when needed and passed to the primary physician. This could be done by, for example, restricting access to only the primary physician who is assigned to the patient according to what some interviewees suggested, which could protect patients' privacy.

Furthermore, hospital managers should raise a request to the MoH in their countries to write up a united privacy policy, which could protect patients' information and do that by listening to healthcare professionals' points of view. Some physicians' participants have highlighted that there are no policies in Saudi Arabia to prevent the misuse of patient information and to protect this information:

*“Whoever makes the policy that implements these EHR? Not the staff themselves, but maybe the managers. I think there should be some type of barrier to sensitive information” (H1P6).*

Another has explicitly stated that there are no policies for the patient-physician confidentiality agreement: *“Well, I have no policy or clear policy” (H1P15)*. By having a policy, the hospital might ensure the success of the change phase of the EHR implementation, and the system used by healthcare professionals while preserving their self-perception as healthcare professionals that respect their patients, culture and religion.

- **Second**, since it is responsible for providing the system to hospitals, the **MoH** in Saudi Arabia should consider cultural aspects when buying or implementing an EHR system or at least update the existing one to comply with the cultural norms and traditions. For instance, unlike in Western countries, relative marriage is widespread in Saudi Arabian culture, which is the leading cause of many genetic diseases (Becker *et al.*, 2001; Alotaibi, 2017; Alenezi *et al.*, 2015). Therefore, detailed patient information is crucial to give a more accurate diagnosis of the patient's situation. According to the participants, this kind of detailed information is lacking in the EHR system, as discussed earlier.

Furthermore, Saudi citizens tend to have more than two wives, as it is *Halal* (حلال) in the Islamic religion to have up to four wives. Moreover, as explained in the paragraph above, cultural and religious perspectives are essential when planning to implement an EHR system. Physicians have expressed that the system cannot associate more than one wife with the same person. This default causes them to not connect the wife to her husband. Having this information (that the patient has more than one wife) has helped them explain many complications or diagnoses for the patient. H1P7 said:

*“She is a second wife, or something could explain the whole complication or diagnose for the patient [...] if you know the social-economic, or you can access the social-economic status” (H1P7).*

Therefore, we believe developing a localised EHR system that considers the geographic location, religion and cultural norms could help the EHR system be more acceptable to healthcare professionals. As a result, the government, hospitals, patients and healthcare professionals would gain the required benefits from the system.

In addition, Saudi Arabia announced its Saudi Vision 2030 in 2015, and this study gives exceptional importance and significance to this matter because the successful adoption of EHR and improving the quality of patient care are part of the Saudi 2030 Vision (Alshahrani *et al.*, 2019). Further, to achieve these goals, the Saudi government increased its spending on healthcare from 8% of its GDP in 2018 to more than 14% in 2022 (Singhi, 2022), and failure to achieve this goal will cause financial loss for the economy and hospitals (Aldosari, 2017). Hence, since the MoH in Saudi Arabia is responsible for the healthcare success part in the 2030 Vision, providing a good understanding of the healthcare professionals' resistance to the EHR system in Saudi Arabia might reduce resistance and increase the chances of success for the EHR system, and ultimately the Saudi 2030 Vision

- ***Third***, for ***non-Saudi healthcare professional workers***. A further significant practical contribution is the different cultural and religious norms that our findings have highlighted which have influenced healthcare professionals' resistance to the EHR system. The significance of these cultural and religious findings is that they can guide and help other non-Saudi healthcare professionals since many healthcare workers in Saudi hospitals are from different nationalities due to the lack of Saudi healthcare professionals. Consequently, a lack of understanding of these cultural and religious factors will result in a lack of satisfaction with their patients and a reduction in the quality of care desired by the Saudi Arabian government. Thus, it eventually would impact the professional identity of a healthcare professional.

### **7.3 Limitations & Future Studies**

Our study investigated how professional identity theory could explain EHR resistance to change among Saudi healthcare professionals. This in-depth qualitative study aimed to develop a deeper contextual understanding of EHR resistance in a context where cultural



and religious factors are essential. However, despite how our study provides valuable results on this matter, our study has limitations:

- For cultural reasons, it was challenging to gain access to and undertake interviews in governmental organisations, particularly healthcare organisations where many vulnerable people exist (e.g., patients). In Saudi Arabia bureaucracy and strict regulations to enter organisations, for example, are challenges for any researcher seeking to collect data. Hence, our study was unable to interview patients due to the challenges the researcher faced in recruiting them, which is one of the limitations of this study. Interviewing patients was one of the researcher's goals at the start of this project; however, the difficulties faced speaking with patients during a vulnerable time while they were at the hospital were not ethical nor accepted by healthcare professionals. Patients are an essential factor for the EHR system implementation, particularly in Saudi Arabia, as our data showed how important their opinion is for healthcare professionals, and their resistance to the system was mainly related to patient issues. Thus, future studies could take into consideration patient's opinions.
- Another limitation is that this research focused only on public-sector hospitals. This limitation is mitigated by the fact that the MoH supervises all hospitals. Studies on the private sector are encouraged to explore whether employee behaviour with more accountability (private sector) than public sector employees might differ. For example, resistance to EHR change by Saudi healthcare professionals and their lack of interest in following hospital policies might be due to job security in the public sector. Governmental workers in Saudi Arabia enjoy job security (Al-Asfour & Khan, 2014) which means they can guarantee their job and it is hard to be fired while the opposite is what is happening in the Saudi Arabian private sector, and this might lead healthcare professionals to consider this before resisting the EHR change. Hence, future studies could investigate whether being a healthcare professional working in a private sector hospital influences the decision to resist the EHR system. Also, future studies could have comparative research between public and private hospitals in Saudi Arabia.

- A further limitation of our study is that the study has only focused on interviewing physicians and nurses. Other healthcare professionals such as pharmacists, dentists, physiotherapists and occupational therapists' experiences are essential to understand what kind of challenges they face when using the system. To illustrate, our study has only heard one viewpoint from the people who are facing the patients or having daily communication with patients. However, it would be interesting to hear the story from the other side; those are the people who might not have any or have less direct contact with patients. Hence, future studies could look into this area.
- Another possible limitation is the data collection process. This might be due to the type of participants in our study, and the fact that our study was conducted in the middle of the COVID-19 pandemic. Healthcare professionals such as nurses and physicians who work in an intensive environment, where people's lives are often at stake, are always busy. Hence, this might have influenced the time and data they gave us and tried to shorten the interview as much as possible with less data being given. Some of them have been distracted by their work as some of our interviewees have been called many times, and one of our potential participants had to quit the interview to deal with an emergency. However, to mitigate this limitation, the researcher tried to approach participants in their free time, yet, healthcare professionals' free time might not be as quiet as other workers.
- Qualitative in-depth interview is one of the possible limitations of our study. Despite the advantages, there are some criticisms of qualitative in-depth interview research. One of the major criticisms of conducting in-depth interviews is that it is considered a challenge and that it must be done through a well-trained researcher for that kind of interview, and many in-depth interviews advocate has raised this issue (e.g., Ritchie *et al.*, 2013; Fitzpatrick & Boulton, 1994). This is because, for this kind of interview (an in-depth interview) to capture a complete and in-depth understanding of the phenomenon in the study, the researcher should be well trained to deal with the participants, to know when to ask follow-up questions and be a good listener. Therefore, to be trained for in-depth interviews, I have attended training sessions about conducting an interview (e.g., qualitative research

interview methods and practice) (Table 4.4). I have also taken a class during the first year of my PhD about qualitative research and how to collect data. I have also been watching lectures on YouTube about conducting an in-depth interview to increase my interview skills and learn some techniques that could help. Finally, I have taken some advice on how to conduct an interview and ask questions from my supervisors, and a whole meeting just before going to Saudi Arabia took place to discuss the interview questions and receive supervisor feedback and suggestions.

<b>Sessions were taken to start data collection and conducting interviews</b>	<b>Type</b>
Justifying methods of choice (MNGT 701)	PhD course
Qualitative research interview methods & practice	Training session
Approach to qualitative analysis	Training session

**Table 7. 1** Table detailing what training and courses were undertaken to improve data collection and interviewing skills.

# Appendices

## Appendix 1 Physician Participants

Institution	Sex	Unit	Rank	Administration role	Code
<b>H1 Physician</b>	M <sup>32</sup>	Adult neurology	Consultant	Adult neurology program director	H1P1
	M	Adult neurologist	Consultant	Chairperson of the adult neurology department and adult neurologist	H1P2
	M	Stroke fellow	fellow	N/A	H1P3
	M	Cardiac	Consultant	N/A	H1P4
	M	Radiology	3rd-year resident	N/A	H1P5
	M	Neurointensive surgeon	Consultant	N/A	H1P6
	F <sup>33</sup>	Neurologist	Consultant	Board member of the hospital Committee member	H1P7
	M	Neurology	Consultant	Educational Chairman	H1P8
	M	Gastrointestinal	Fellow	N/A	H1P9
	M	Gastrointestinal	Physician	Patient relations	H1P10
	M	Long disease	Fellowship	N/A	H1P11
	M	Intervention cardiologist	Consultant	N/A	H1P12
	M	Adult emergency consultant	Consultant	Team leader	H1P13
	F	Emergency medicine	Consultant	N/A	H1P14
	F	Stroke neurologist	Consultant	N/A	H1P15
	M	Neurointensive surgeon	Consultant	Chair of the neurosurgery department	H1P16
<b>H2 Physician</b>	M	Paediatric	Resident	N/A	H2P1
	M	Paediatric	Fellowship	N/A	H2P2
	M	Paediatric	Consultant	Head of Paediatric Department	H2P3

<sup>32</sup> Male

<sup>33</sup> Female

	F	Paediatric	Resident	N/A	H2P4
	M	Paediatric	Junior Resident	N/A	H2P5
	F	N/A	Medical intern	N/A	H2P6
	M	Family medicine	Fellow	N/A	H2P7
	F	Paediatric	Medical intern	N/A	H2P8
	Male	N/A	Medical intern	N/A	H2P9
	M	Paediatric	Fellow	N/A	H2P10
	F	Paediatric	Resident	N/A	H2P11
	M	Paediatric	Resident	N/A	H2P12
	M	Thermology	Consultant	N/A	H2P13
	M	Family medicine	Consultant	N/A	H2P14
	M	Gastrointestinal	Consultant	N/A	H2P15

## Appendix 2 Nurse Participants

Institution	Sex	Unit	Rank	Administration role	Code
<b>H1 Nurses</b>	M	Chef manager	Nurse	Coordinator for other departments	H1N1
	F	Surgery Unit	Primary Nurse	N/A	H1N2
	F	Charge of the care unit	Nurse	Nurse Leader	H1N3
	F	Cardio OR	Adjusted nurse	N/A	H1N4
	M	Epilepsy coordinator	Nurse	N/A	H1N5
<b>H2 Nurses</b>	F	Paediatric Unit	Staff nurse	Leadership of Nurses	H2N1
	F	Paediatric	Nurse	N/A	H2N2
	F	Paediatric	Staff nurse Bedside nurse	N/A	H2N3
	F	Paediatric	Staff nurse	N/A	H2N4
	M	Paediatric	Assistant Nurse And the assistant head of the nurse department	Supervising Nurses	H2N5
	F	Endoscopy surgery unit	Nurse	Head Nurse	H2N6

# Appendix 3 Healthcare Practitioners Information Sheet



## Healthcare Practitioners Information Sheet

**Research Title: Professional Identity's Role in Healthcare Practitioners Resistance to EHR Change: A Study from Public Hospitals in Riyadh, Saudi Arabia**

### Introduction:

I would like first to thank you for showing an interest in taking part in my study. I am a PhD student at Lancaster University, management science department. I would like to invite you to take part in my research study, which is about understanding and exploring why healthcare practitioner are resisting the change to electronic health record (EHRs). The system has a great potential to reduce medical errors, and healthcare cost. Therefore, I believe it is important to understand their point of view.

Below you can find information about the study, I am very pleased to answer any type of questions you may would like to ask.

### What is the study about?

**This study aims to understand how healthcare practitioners' (HP) professional identity can act as a factor of resistance to EHR change. The reason for choosing HP, as they play a major role in gaining the benefits from the applications, as we are interested in exploring their resistance to a specific application which is EHR. Furthermore, they are many factors could contribute to their resistance, such as socially, culturally, and professionally. Therefore, this research will utilize these factors to come with a perception about the reason for resistance, as we believe they play a major role into decision making process for using the application.**

### Why have I been invited?

I have approached you because I am interested in understanding HP's point of view about the information healthcare system application, and in particular, EHR application. As a HP, your voice is important and must be heard in order to succeed in the implementing EHR. The results will be useful to provide guidance for future plans to implement related systems, and why users are resisting the change.

Therefore, I would be very grateful if you would agree to take part in this study.

### What will I be asked to do if I take part?

If you decide to take part, this study will involve a 30 to 60mins interview. I will be asking you an open-ended question, which may or may not lead to sub-questions. The questions will cover general questions, such as your role at the organization, and in-depth questions, which concern about how you look at the health information system applications, and your opinion about them.

### What are the possible benefits from taking part?

**If you take part in this study, your insights will contribute to our understanding to the reasons for resistance, and that will make further planning more suitable to you as a healthcare professional.**

### Do I have to take part?

No. It's completely up to you to decide whether or not you take part. Your participation is voluntary. **If you decide not to take part in this study, this will not affect your position in the organization and your relations with your employer.**

### What if I change my mind?

**If you change your mind, you are free to withdraw at any time during your participation in this study. If you want to withdraw, please let me know, and I will extract any ideas or information (=data) you contributed to the study and destroy them. However, it is difficult and often impossible to take out data from one specific participant when this has already been anonymised or pooled together with other people's data. Therefore, you can only withdraw up to two weeks after taking part in the study.**

### Will my data be identifiable?

**This is a completely anonymous exercise. You and the data will not be identifiable.** After the interview, only I, the researcher conducting this study will have access to the interview recording. After the interview, the information collected from you will be anonymised, and you will not be named in any outputs (e.g. PhD thesis, publications, etc). The anonymised interview will be later analysed and shared with my supervisors as means of guidance, your information, including the recording will be safely secured on encrypted devices and will only be available to me.

### How will we use the information you have shared with us and what will happen to the results of the research study?

The information you provide will be used in writing up the PhD thesis as well as presenting them as the findings of this study in academic journals articles, and/or conferences or seminars. You, your department, and your hospital will not be named in any result or output whatsoever. **No data will be identifiable, everything will be anonymized.**



**How my data be stored?**

All of the information you provided will be encrypted and stored on password protected devices. In accordance with University guidelines, I will keep the data securely for a minimum of ten years.

**What if I have a question or concern?**

If you have any queries or if you are unhappy with anything that happens concerning your participation in the study, please contact me Abdulrahman Aldoghiher or my supervisors.

**Researcher**

**Abdulrahman Aldoghiher**

**Supervisor**

**Prof. Monideepa Tarafdar**

**Supervisor**

**Dr. Richard Williams**

If you have any concerns or complaints that you wish to discuss with a person who is not directly involved in the research, you can also contact **Professor John Boylan, Head of Management Science department at Lancaster University.**

For further information about how Lancaster University processes personal data for research purposes and your data rights, please visit our webpage:

[www.lancaster.ac.uk/research/data-protection](http://www.lancaster.ac.uk/research/data-protection)

<p>This study has been reviewed and approved by the Faculty of Arts and Social Sciences and Lancaster Management School's Research Ethics Committee.</p>
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**Thank you for considering your participation in this project.**

# Appendix 4 Interview Protocol

## A- Physician

<b>1-EHR Usage Context</b>
<ol style="list-style-type: none"><li>1. As physician, is there any items or information about the patient that should not be stored in EHR? if yes, could you please give a reason for that?</li><li>2. Is there any information or item which cannot be stored now, which need to be stored? If yes, could you please give your reason, and what kind of information they are?</li><li>3. As physician, are there any parts of the information record that you have access to, and you believe are not necessary for you to do your job? If yes, could you please give a reason for that?</li><li>4. As physician, is there any patient information that you are not allowed to view or have access to, and you believe it is necessary for you to do your job? If yes, could you please give a reason for that?</li></ol>
<b>2-EHR User Experience</b>
<ol style="list-style-type: none"><li>1- What would restrain or facilitate the EHR performance from your point of view?</li><li>2- What are your ideas to improve the system for a better and easy usage to EHR?</li><li>3- What are the changes that has been occurred after EHR implementation?</li><li>4- If I may, what do you think about HIS in general? And what is the impact on your performance when using it as a healthcare provider? What kind of impact?</li><li>5- What is the process of storing and gaining patient's information? Is it time consuming?</li></ol>
<b>3-Percieved EHR Usefulness</b>
<ol style="list-style-type: none"><li>1- Have you seen or realised any benefits yet from the system? Has it made you change your opinion about EHR?</li><li>2- How do you think that implementing HIS or EHR in general could have a positive impact on terms of cost and medical errors reduction, improving the quality or work, and communication? etc?</li><li>3- As physician, do you have the decision whether to use HIS or EHR? why?</li><li>4- What do you think it would be the reason of resistance towards EHR could be, if any?</li></ol>
<b>4-Impact and Challenges on Patients and Workflow</b>
<ol style="list-style-type: none"><li>1- If I may, what do you think about HIS in general? And what is the impact on your performance when using it as a healthcare provider? What kind of impact?</li><li>2- What are the changes that EHR implementation has brought with (policies and practises)?</li><li>3- What was your opinion when it has been (EHR) first introduced? Have you used it at first or not? Why? How would you deal with it if it has changed the way you work?</li></ol>
<b>5-Privacy</b>

- 1- As physician, do you need or does the hospital need patient's approval to share their information with other department in the hospital, health organizations, or third party (insurance companies? And why?
- 2- What do you think about sharing patient's information with other organization? And why?
- 3- Does the patient need hospital or physician's approval to share their information with other department in the hospital, other health organization or a third party (insurance companies)?

**B- Nurses:**

**1-EHR Usage Context**

1. As a nurse, is there any items or information about the patient that should not be store in EHR? if yes, could you please give a reason for that?
2. Is there any information are or item which cannot be stored now which need to be stored? If yes, could you please give your reason, and what kind of information they are?
3. Do you have sufficient access rights to a patient's EHR to do your job?
4. As nurse, is there any patient information that you are not allowed to view or have access to, and you believe it is necessary for you to do your job? If yes, could you please give a reason for that?
5. Do physicians relay on you to write patient's information in their EHR? why?

**2-EHR User Experience**

1. What are the changes that has been occurred after EHR implementation?
2. How is your experience as a nurse with using the system in general? What about understanding patient's information? The reliability of the system?
3. What are your ideas to improve the system for a better and easy usage to EHR?

**3-Percieve EHR Usefulness**

1. How do you think that implementing HIS or EHR in general could have a positive impact on terms of cost and medical errors reduction, improving the quality or work, and communication? etc?
2. Have you seen or realised any benefits yet from the system? Has it made you change your opinion about EHR?
3. As a nurse, do you have the decision whether to use HIS or EHR? why?

**4-Impact and challenges on Patients and Workflow**

1. If I may, what do you think about HIS in general? And what is the impact on your performance when using it as a healthcare provider? What kind of impact?
2. Who do you think is responsible to keep EHR safe? could you please give a reason/s for your answer?
3. What are the changes that EHR implementation has brought with (policies, and practises)?

4. Is it part of your job to use EHR? are you allowed to edit or update any information at the system? If not, why?
5. What was your opinion when it has been (EHR) first introduced? Have you used it at first or not? Why? How would you deal with it if it has changed the way you work?
6. What problems have you faced during the EHR implementation? How did you overcome these problems?

## Appendix 5 Lancaster University Ethical Approval Email

Dear Abdulrahman,

Thank you for submitting your application and additional information for *Professional Identity's Role in Healthcare Practitioner's Resistance to EHR: A Study from Public Hospitals in Riyadh, Saudi Arabia*. The information you provided has been reviewed by members of the Faculty of Arts and Social Sciences and Lancaster Management School Research Ethics Committee and I can confirm that approval has been granted for this project.

As principal investigator your responsibilities include:

- ensuring that (where applicable) all the necessary legal and regulatory requirements in order to conduct the research are met, and the necessary licenses and approvals have been obtained;
- reporting any ethics-related issues that occur during the course of the research or arising from the research (e.g. unforeseen ethical issues, complaints about the conduct of the research, adverse reactions such as extreme distress) to the Research Ethics Officer;
- submitting details of proposed substantive amendments to the protocol to the Research Ethics Officer for approval.

Please do not hesitate to contact me if you require further information about this.

Kind regards,

## Glossary of Arabic Terms

Term	Definition
<i>Itqan</i> إتقان	Muslim's mentality to perform his best work and continue to improve himself at his job
<i>Urf</i> عُرف	Prophet's sayings, and can also relate to what people were practising before Islam if it did not contradict what Islam says
<i>Al-Amannah</i> الأمانة	Healthcare professionals' religious obligation to protect their patients' best interests as part of their professional, culture, and religious duty
<i>Wasta</i> واسطة	Type of personal relationship that is used to get things done
<i>Et-Moone</i> تمون	Type of relationship in Saudi Arabia where partners allow for unilateral decision-making without damaging the relationship
<i>Ehtesab</i> احتساب	Healthcare professionals doing their best in work and clinical duties and not expecting rewards from people, but from God, whether in this life or afterwards
<i>Faz'za</i> فزعة	How Saudi healthcare professionals show their support and solidarity to their kinship, friends relatives and others who need help by protecting their medical information from being digitally recorded
<i>Taqwa</i> تقوى	How healthcare professional monitors their own behaviour without a human supervisor
<i>Adl</i> عدل	How healthcare professionals feel about the EHR system causing injustice between them and their peers
<i>Mahram</i> محرم	Female's Muslim relatives, and it includes father, brother, brother's son, sister's son, uncle, and mother's brother
<i>Morafiq</i> مُرافق	A representative of the patient if the patient is a female of any age and if he is a male under the age of 18. However, this is usually used when there is a female patient because she must have a male relative with her.
<i>Haram</i> حرام	Islamic term of what is forbidden according to the Quran, and Sunnah
<i>Halal</i> حلال	Is the opposite of Haram, and it includes any doing that complaint with the Sharia principles

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