A Modified Technology Acceptance Model (TAM) for Implementation of Privacy in Health Information Systems in Saudi Arabia

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Biomedical Informatics

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Final Dissertation Defense Approval Form

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ABSTRACT

This study developed a modified technology acceptance model (TAM) based of the actual adoption of the privacy of health information that suggested that external factors of culture and awareness of health information privacy predicted internal factors of privacy, including confidentiality, accountability, and regulations and policies. The study was concerned with the effects of culture and the nature of privacy, as well as the ways in which people's sensitive information is accessed and maintained by healthcare facilities. The study provided detail regarding the need for improved information privacy in the Saudi healthcare setting. A survey instrument was designed and used to assess the knowledge of the privacy of health information among Saudi professionals in the fields of IT, medicine, and law. The data were analyzed to determine whether or not there was any connection between participants' characteristics, especially from a religious culture perspective, and their attitudes about the privacy of health information. One-way ANOVAs were conducted to assess differences across professions for each of the outcome and predictor variables. No significant differences were found for accountability, or regulations and policies. Significant differences among professions were found for confidentiality, awareness, and culture. Post hoc analyses indicated that medical professionals reported significantly greater adherence to confidentiality than did law professionals, but they demonstrated significantly lower awareness and culture. Law professionals were also significantly higher in culture than were information technology professionals.

ACKNOWLEDGMENTS

All praise is due to Allah The Mighty, for blessing me with the ability to complete my dissertation.

This dissertation is more than an individual accomplishment. I would like to acknowledge my sincere appreciation of my advisor, Dr. Syed Haque, for his guidance, direction, and unlimited encouragement.

I would also like to express my sincere thanks to the members of the dissertation committee, Dr. Srinivasan and Dr. Coffman. Without their guidance, assistance, and feedback, this dissertation could not have been completed. I am particularly grateful to Dr. Srinivasan, for his assistance with the design of the study.

My deepest appreciation goes to my beloved wife, Mashel, and my lovely kids, Alhanouf, Alwaleed and Almuthana as well as my brothers and sisters, for their prayers, patience and encouragement.

Finally, I thank all of my close friends and colleagues sincerely for their help, encouragement, and support.

DEDICATION

I dedicate this to my beloved parents, Sulmi and Hamidah, who taught me to be patient and to respect time and the value of hard work.

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CHAPTER 1

INTRODUCTION

Background

Every society has a distinctive culture that consists of a number of fundamental elements, prominent among which is the religious background/s of its people. This is the case for the country of Saudi Arabia, which is an Islamic society. The Kingdom of Saudi Arabia spans a great portion of the Arabian Peninsula, and has a population of 26 million .¹ Saudi Arabia is an absolute monarchy with a constitution that is based on the Quran, the Islamic holy text. During the 20th century, the country used the revenues from its oil reserves to improve and develop medical and health institutions,¹ and as a forward-thinking society, Saudi Arabia is known for the high quality of those services.

Along with the growth of healthcare organizations has come a growing dependence on information technology (IT) for the proliferation and management of electronic services offered by Saudi hospitals. As a result, Saudi patients are more concerned about the security of their personal data within hospital settings.² Because Saudi Arabia is a Muslim society, healthcare providers are obliged to meet the cultural and religious needs of patients. Because the structure and outlook of hospitals in Saudi Arabia are well defined, in that the healthcare system is predominantly governmental,³ citizens expect trust, privacy, and security in the healthcare system.

Patients of both genders receive treatment based on the tenets of the Islamic culture found in both government and private healthcare facilities throughout Saudi Arabia. Many studies have addressed the levels of patient satisfaction with healthcare systems.^{4, 5} These studies have revealed that women and men are careful to choose facilities and physicians that fulfill their religious observances, spiritual needs, and cultural norms as Muslims. Because "Islam is a comprehensive way of life," patients seeking medical care assess treatments in accordance with their Islamic beliefs.⁶ For this reason, hospital staff must be trained carefully in the procedures that facilitate Muslim patients' stays in Saudi hospitals.

The prevalence of IT in Saudi Arabia's healthcare organizations has created a dependency on the development of information security tactics. "The loss of sensitive patients' data may cause a huge damage to the organization['s] reputation".² Consequently, many studies have been performed to assess the ability of medical staff in Saudi hospitals to control the flow of patient information.^{2, 3, 7} These actions help improve competitiveness in the healthcare market, build patient confidence, and establish organizational reliability.

The care of electronic medical records (EMRs) is also associated with the control of patient privacy in the Saudi healthcare system. EMRs help to ensure that patient data are shared among and maintained only by authorized individuals.⁸ It is important to note that the privacy of patient data is important because it protects patients from economic and social harm that can disrupt their lives. Moreover, the protection of data is also necessary to ensure "the integrity of healthcare data (prevention of unauthorized modification of information)".⁸ Therefore, the formulation of security policies is mandatory, as it helps reduce potential threats to patients. However, there are various factors that have restricted healthcare departments' ability to maintain the privacy of sensitive information.⁹ While disclosing private health information is considered by most

people to be unethical, many health practitioners believe that disclosing information is mandatory in some instances.

For example, the government can implement important policies based on patients' medical reports. Such conflicting views compromise the ability to maintain the privacy of health-related information. Legal issues are also a factor in the maintenance of information privacy, and the legal rules framed for healthcare are not followed properly by all departments.¹⁰ Similarly, there are various social issues pertaining to the maintenance of patients' private information. Medical information is sometimes demanded by family members for various purposes, and the main source of harm to the social dignity of the patient is derived from those cases in which information is disclosed to family members. Thus, new, health-related innovations can be achieved by conducting research on this topic.⁹

Purpose of the Study

The purpose of this study is to discuss how religiosity as an aspect of culture affects the privacy of health information in Saudi Arabia. Admittedly, healthcare institutions consider the views of patients more often in the evaluation of their facilities; in addition, authors argued that the concern for quality healthcare services should not be limited to economic efficiency and clinical effectiveness, but should be linked as well to the patients' social needs.⁷ This is consistent with the purpose of this study, as it associates patients' social needs, which depend on culture and religion, with the healthcare environment. As such, it is necessary for healthcare IT planners to "consider the myriad differences among cultures as they work to implement new forms of technology in new

settings".¹¹ Hence, this study will be based on the conviction that Saudi healthcare settings that serve Muslim patients must implement health information systems cross-culturally so that the patients' cultural norms and values are appreciated.

Importance of the Study

This study is important to the welfare and safety of patients seeking services from Saudi Arabia's healthcare facilities. Further, in global terms, the findings of this study can be used to verify the importance of evaluating the quality of healthcare from a cultural perspective. Muslim patients need to be cared for in specific ways that are dictated by their religious beliefs. Yet, there is limited information about the issue of caring for Muslims who undergo medical treatment, either on an inpatient or outpatient basis.^{12, 13} In order to augment data on the effect of culture and religion on the privacy of health information, the purpose of this study is to examine people's attitudes towards the privacy of their information in Saudi healthcare facilities.

Because "Healthcare practices can reflect religion, culture, and/or geographic location"¹³ it is crucial to investigate these factors in the context of patient privacy. In this way, one can prevent ethical dilemmas that may arise in caring for sick and needy individuals. High quality and ethically sound treatment is expected of all healthcare professionals. However, there may be situations in which this does not occur. Therefore, this study focused on understanding the influence of religious culture on the privacy of health information in order to establish better relationships between Muslim men and women in need of care.

Statement of the Problem

With the advance of information technology in Saudi health systems, there is an increased need to protect patients' information and to treat them in accord with their religious culture so that they are satisfied with the healthcare process. Overall, due to the rapid technological changes in medical organizations in Saudi Arabia, there is a constant need to redesign and develop new patient services.

Theoretical Framework

Healthcare organizations are often thought of as business environments in which patients are considered to be customers. Thus, some researchers have applied the concept of globalization to this theoretical framework, naming specific industry drivers, such as cost, technology, government policies, and competition. Health organizations have also been defined as macro-environments that are collections of broader forces that influence the organization's micro-environment.¹⁴ Given this scenario, one can assume that the macro-environment determines critical factors, such as the growth and profitability of medical enterprises. Thus, the comprehension of healthcare organizations' external environments can help strategic decision makers who wish to serve the Islamic community in Saudi Arabia more appropriately.

The macro-environment theory helps to identify opportunities for, and threats to, healthcare organizations. Political/legal, economic, socio-cultural, and technical (PEST) variables comprise the framework used to analyze healthcare organizations. For example, in the political/legal sector, "the overall philosophy is to generate a culture of continuous quality based on effective cooperation between staff, systems spotlight, investment in people and staff, and self-monitoring".¹⁴ Perhaps the most salient element in this research is the social/cultural environment. Based on the wants and needs of the consumer, this sector has been studied by researchers who claim that it has a positive influence on healthcare services. The technological environment is another variable through which healthcare organizations offer consumers valuable medical assistance. Although costly, technological advances have enabled Saudi hospitals to handle a variety of client cases more efficiently.

Halligan posited a theory about ways in which to care thoroughly for Muslim patients in healthcare organizations, and he stated that quality care consists of elements of both art and science. More importantly, there is an inherent relationship between caring and culture that exists in the healthcare environment. There are three important areas to consider when patients are receiving critical care: communication, technology, and the needs of family members.¹⁵ Although many studies have been conducted on the acculturation of immigrant patients in Western societies, there is insufficient evidence of the effects of culture on the health information privacy of Muslims in Middle Eastern societies. For this reason, more research is needed in this area.

A Japanese marketing professor developed the Kano model to assess a customer's or patient's satisfaction with the attributes of a product or service. The Kano model includes four attributes: indifferent, "must be," attractive, and one-dimensional. The indifferent category specifies that the attribute in question is of no concern to the patient. The "must be" category, which is often called the threshold, indicates that the attribute or specification is necessary. The attractive category means that a product or service gains value in the presence of the specification. Lastly, the one-dimensional category reflects a patient's choice.¹⁶ Further, the authors made the following assertion based on their study of patients suffering from kidney ailments:

Apart from the fundamental need for respecting and addressing patients/customers' needs and satisfying their wishes, it is also crucial to do so because compliance to their treatment and its outcome is closely related to the patients' satisfaction (real or imagined) with their therapy. (p. 53)

With these findings, the Kano model illustrates that healthcare managers must help doctors and nurses use appropriate communication skills and show empathy, both of which increase the level of patient satisfaction.¹⁶ Hence, the Kano model is promising, in that it allows researchers to delve into the beliefs and feelings of patients with regard to their expectations for treatment.

In addition, the information boundary theory (IBT) was developed from a business perspective, but it can be applied to the healthcare perspective as well. "In general terms, IBT predicts that individuals' behavior follows rules for 'boundary opening' and 'boundary closure'".¹¹ Boundary opening and closure refer to psychological processes in which patients can control information flow based on intimacy. Moreover, boundary regulation may occur either verbally or non-verbally.¹¹ This theory is relevant to health information privacy, in that a healthcare organization has the power to regulate knowledge management through e-services designed to ameliorate the patient's stay in the hospital.

It follows that IBT can help explain how patients relate to hospitals via information processes. Thus, IBT promotes the study of human relations from the IT perspective. Termed as a motivational theory, IBT presents three main motivations, trust

and fairness, instrumental purposes, and expressive purposes. Also, IBT posits an edge condition known as the "zone of acceptance".¹¹ In this zone, it is understood that sometimes patients and healthcare professionals participate in routine communication without the formation of any boundaries. Thus, the design and implementation of culturally sensitive IT applications begins with the acknowledgement of the need for improved communication between staff and patients.¹¹ Naturally, in the Middle East, the interaction between cultural values and privacy issues is a major topic of discussion in the healthcare community, especially in Saudi Arabia.

With the increasing complexity of healthcare facilities, clinicians have begun to prefer EMRs to conventional paper records.¹⁷ Unlike paper records, which cannot be shared easily between two or more different clinicians located in separate hospitals, EMRs are accessible and enable clinicians to exchange health information flexibly. This improves both the productivity and quality of the healthcare provided.¹⁷ Some benefits of EMRs include ease of access to patients' histories, including allergies, medications, and laboratory test results. Some drawbacks to EMR implementation include technological and economic barriers, disorganization, and behavioral resistance to change.¹⁷ Thus, healthcare organizations have begun to apply EMR solutions for the enhancement of patient services and for the privacy and security of patient data. There are numerous reasons to place a high value on protecting the privacy, confidentiality, and security of the health information system. Different authors have come up with a variety of views on the implementation of privacy in healthcare information systems. Privacy has been described as a basic human right with intrinsic value to individuals.¹⁸ It has been argued that privacy is valuable, because it facilitates and promotes other fundamental values,

including ideals of personhood, such as personal autonomy, individuality, respect, dignity, and worth as a human being.

It is therefore essential that healthcare information systems maintain an element of privacy so that patients' personal information can be kept confidential and cannot be used by others for unethical purposes. One of the ethical requirements of healthcare systems is to maintain the privacy and confidentiality of the information that is submitted by the patients in their respective healthcare units.¹⁸

In a culturally sensitive environment, the need to maintain the privacy of the health information system is necessary in order to preserve the dignity of the patients.

Research Questions and Hypotheses

Research questions

Question 1: Does religious culture influence the privacy of health information?

Question 2: How are religious culture and the privacy of health information related to each other, and does the relationship differ across various professions?

Hypotheses

- Hypothesis 1: Religious culture and awareness are significant predictors of privacy variables.
- Hypothesis 2: The relationship between religious culture and privacy variables is mediated by awareness.
- Hypothesis 3: People of various professions differ significantly in their attitudes towards each of the privacy variables.

CHAPTER 2

LITERATURE REVIEW

Definition of Health Information Privacy

Defined as "the right and desire of a person to control the disclosure of personal health information," privacy is a very important matter in healthcare IT systems.¹⁹ In hospitals, patients not only expect to receive quality care, but they also want their personal information to be held in confidence. As patients are so-called customers in a medical organization in which the business is healthcare, they appreciate quality service. As well as the right to privacy, patients believe that they should have both confidentiality and security, particularly with respect to their medical records.

Privacy has been described as the right of an individual to be left alone, while having control over the flow and disclosure of personal information.²⁰ Just as businesses gather information about customers, hospitals do the same by recording very sensitive medical information about patients. Yet, because of information technologies that help process information quickly and efficiently, privacy issues have become a greater issue .²⁰ In this information age, people are more aware of the ease with which information transfer and exchange can occur. ¹¹ Thus, they do not want hospital staff members, such as doctors and nurses, to disclose facts about their medical conditions without their approval.

The internet is an innovation that also affects the flow of information in society today. However, online services used by hospitals are a threat, because they do not always ensure that third parties cannot purchase patients' sensitive data.²¹ For this reason, privacy

and confidentiality are linked. Confidentiality has been defined as the controlled release of patient information to a healthcare provider under the conditions that the use and future release of the data are monitored carefully. Thus, for the average patient, the right to privacy includes confidentiality.²¹

Similarly, privacy is related to another major area of concern in most hospitals security. Security is a collection of "policies, procedures, and safeguards that help maintain the privacy and availability of information systems and control access to their contents".¹⁹ Patients expect that their records and other private data are kept secure so that none but healthcare professionals can extract and use sensitive details. Hence, security entails both managerial and technical measures to prevent unauthorized access to health information.²⁰ Medical staff and IT professionals are responsible for protecting the privacy of patients' data. As such, information security and user behavior must be monitored carefully to reduce the risk of security threats.² Patient privacy is related closely to the healthcare organization's ability to maintain a high level of information security.

To define patient privacy adequately, one must consider confidentiality and security. Because this is the information age, the storage, retrieval, and distribution of patient medical files require careful managerial and technical measures. Provided that a patient has the right to privacy, s/he also has the right to confidentiality. Threats to the disclosure of patient data can come from inside and outside the hospital setting.² This is why information security is such a prominent issue and one that must be handled meticulously at all levels of the organization.

Privacy in Healthcare Systems

Healthcare approach patient information systems today from а goods/commodities perspective.²² This approach is similar to that in businesses, in which the patient expects to receive quality treatment while in the care of the medical organization. Moreover, the medical organization holds the confidence of the patient by promising to protect his/her private data. Due to the challenges imposed by globalization, the business of medical care is complicated when handling personal information. This is an unfortunate situation that many hospitals worldwide address. "Data protection is about the fundamental right to privacy".²² Therefore, data protection, like information security, is the responsibility of the hospital or clinic caring for the needs of the patient.

According to Article 31 of the basic law of the Saudi government, "The State shall look after public health and provide healthcare for every citizen" ("Chapter Five," 2014, p. 1).⁵¹ However, the constitution does not provide for the right to health information privacy. The only provision for information privacy is stated in Article No. 40 from Chapter Five of The Basic Law of Government (Saudi Constitution): "The privacy of telegraphic and postal communications, and telephone and other means of communication shall be inviolate. There shall be no confiscation, delay, surveillance or eavesdropping, except in cases provided by the Law".⁵¹

In 2007, the Anti-Cyber Crime Law was enacted in order to define IT crimes and punishments.²¹ As the trend towards information and communication technology (ICT) in healthcare has grown, hospitals take care to abide by existing laws. When security breaches do occur, they "can result even in legal consequences, fines, and penalties".² Moreover, the citizens of Saudi Arabia can be prosecuted for a plethora of crimes,

including: 1) unlawful computer access for the purpose of deleting, destroying, damaging, or redistributing private data; 2) harm to an information network to breakdown, destroy, leak or alter existing data, and 3) obstruction of access to services by any means.²³ To avoid the high cost of mistakes in healthcare IT systems, hospitals not only must consider information security created by advanced technologies, but also protective measures delivered by users of these systems. For example, a research study found that there were high levels of threat to patient privacy among staff at Saudi hospitals due to poor professional use of the health systems. It is essential to protect patient privacy via careful use of healthcare systems by staff members who are properly trained.²

Next, staff members who use health IT systems include doctors and nurses. They, too, can misuse patient information in the technology-oriented environment.¹⁷ For this reason, many hospitals are not only losing patient loyalty, but are also losing the return on their IT investments. The 1981 formation of the Gulf Cooperation Council (GCC), which consists of Bahrain, Kuwait, Oman, Qatar, the UAE, and Saudi Arabia, has helped promote science and technology measures. Yet, research showed that, out of seventeen health and social assistance sites online in the GCC, only three of them had privacy policies. This finding compounds the problem of improper healthcare staff training, in that doctors and nurses may have limited access to online services. Many new technologies exacerbate this problem by not securing the collection and disclosure of patients' personal information.²⁰ Thus, healthcare professionals in Saudi Arabia have the task of handling private data in a responsible manner.

In addition to online services, hospitals in Saudi Arabia and abroad must adhere to the meticulous upkeep of EMRs. Proper maintenance of EMRs is essential to the productivity of healthcare organizations. "Privacy of information collected during healthcare processes is necessary because of significant economic, psychological, and social harm that can come to individuals when personal health information is disclosed".⁸ Healthcare organizations, both in the government (i.e., Ministry of Health), and the private sectors of the country, are authorized to perform data protection of EMRs.²⁴ Therefore, e-services in government and private-run hospitals promise to increase efficiency and effectiveness in medical organizations.

In so doing, Saudi health and prosperity are tied to information security and timesavings due to e-services.¹ Information security and time-savings are benefits created by EMRs in conjunction with five other functions: availability; accountability; perimeter definition; role-limited access, and comprehensibility and control.¹⁹ On the other hand, some of the barriers to rapid deployment of EMR services that have been reported are lack of awareness of their usefulness, high maintenance costs, physician resistance, and instability of new software providers.²⁵ Nevertheless, the potential benefits of e-services to patients include improved medication safety, and enhanced interdisciplinary communication that facilitate patient health.¹⁷ Likewise, doctors benefit from e-services in the following ways: 1) prevention of human error in handwritten orders; 2) improvement in quality of healthcare, and 3) reduction in the time required to locate and read patients' charts.¹⁷ Thus, as this GCC country continues to advance technologically, preparing and using methods that employ electronic services has become a common practice. It has been stated that the implementation of privacy in the healthcare information system is necessary in the current era of technologically driven healthcare units.²⁶ This is because, with the advent of electronic and computer technology, quick and efficient services are being provided to the patients, but at the same time, there may be cases in which leakage of patients' personal information occurs. As a result of the digitalization of healthcare information system, new threats to patients' privacy are becoming evident.²⁷

Healthcare service providers must be smart and sensitive when they communicate patients' information via fax, telephone, or email, as others beside the addressee may process the message during normal business hours.²⁶ In addition, it is possible for electronic messages to go to the wrong parties, who might then use the information for unethical purposes.

It has been acknowledged further that the internet does not provide a secure media through which to transfer confidential information, unless both the parties use encryption technologies. Therefore, although services are provided quickly and easily, it is necessary to use extra cautious in order to maintain the privacy of healthcare information systems.²⁶

Another important reason to maintain privacy in the healthcare information system in a culturally sensitive environment is the concerns of adolescents. When adolescents require healthcare services, particularly for reproductive or sexual health matters, or substance abuse, they are less likely to seek care if the confidentiality of their health reports are not maintained, or are disclosed to any third party.²⁸ In some instances, patients may refuse to reveal significant information in cases of critical health problems, such as psychiatric behavior and HIV, because disclosure of such medical information may lead to social stigmatization and discrimination. This shows that protecting the privacy of healthcare information is necessary in order to ensure that individuals seek and obtain quality care in a culturally sensitive environment.

Further, in a culturally sensitive society, where certain diseases, such as AIDS, are considered a social taboo and people suffering from it are disgraced socially, it becomes all the more necessary to maintain privacy in the healthcare information system to maintain the dignity of such patients.²⁸ In addition, US society, for example, has placed a high value on individual autonomy in order to ensure that people make their own choices about sharing their personal and sensitive information with others. Healthcare information systems can be subjected to various security threats from one or more sources, including imposter agents, unauthorized users, and unauthorized disclosure.²⁹

Discrimination in health insurance and employment also exists in certain cases, and thus requires the implementation of privacy of healthcare information. According to a survey, employer discrimination based on health information increased from 16% in 1999 to 52% in 2005.³⁰ Not only is confidentiality required to stop this discrimination, but it also is required for the goodwill of the healthcare institutions. If healthcare institutions do not maintain the privacy and confidentiality of their customers' information, it will have a negative effect on those institutions. Thus, overall, it can be said that it is of the utmost importance to avoid security breaches in healthcare information systems.

An analysis of the views and opinions of different authors has shown that there are many factors responsible for maintaining privacy in healthcare information systems, especially in a culturally sensitive environment.

• Due to the excessive reliance on technology by the healthcare industry, it is imperative to safeguard the privacy of patients' medical information.²⁶

- The special concerns pertaining to the health of adolescents and teenagers further necessitates the implementation of privacy of their medical information.²⁸
- Finally, in order to prevent patients from being the victims of social disgrace and disrespect, it is necessary to ensure the privacy and confidentiality of information in the healthcare system.³¹

Of all the reasons recognized, it is clear that the key reason for implementing the privacy of information of healthcare is to prevent patients from being abused because of mental illness or sexually transmitted diseases. Thus, the major reason for maintaining the privacy of healthcare information of patients in a culturally sensitive environment is to maintain their dignity and respect, as highlighted in.²⁸

Key Barriers to Implementing Privacy in the Health Information System

It has been demonstrated that an adequate degree of privacy of healthcare information is not maintained because of various barriers that are experienced in the healthcare information system.³² These include ethical, legal, social, and medical barriers that restrict the ability of healthcare centers to maintain privacy and confidentiality of their patients' information. These barriers tend to affect the faith and trust of the patients being served in healthcare units.³³

There are major ethical issues that have served as barriers to the implementation of privacy and confidentiality of information in the healthcare information system are those related to the disclosure of patients' information, which varies from person to person.³² Some medical practitioners and healthcare centers hold the view that disclosing patients' private and confidential medical information is highly unethical, if not criminal, while others believe that disclosing such information is fair and does not violate ethics.³⁴

Thus, contrasting views on ethical issues have served as a key barrier to the implementation of privacy and confidentiality in the healthcare information system in a culturally sensitive environment.

Various legal issues also serve as barriers to privacy.³⁵ Although many laws have been formulated to maintain the confidentiality and privacy of medical information, many are not implemented properly, which limits and restricts their value.³⁶ Moreover, there are many laws by which it is mandatory to disclose certain types of patient information, and these also serve as barriers to the implementation of privacy and confidentiality of information in healthcare centers.

There are also key social barriers that arise in maintaining the confidentiality and privacy of medical information. In many cases, a patient's medical information can be disclosed by a healthcare unit to his/her close acquaintances or family members for social reasons, or as demanded by the family member/s.³⁷ Thus, medical practitioners are obliged to share the patient's medical information in certain situations when considering the emotions and sentiments that family members attach to the well being of the patient.

Moreover, there are some cases in which family members and acquaintances of the patients are informed deliberately of private and confidential information, in order to make them aware of a patient's deteriorating condition.³⁷ Thus, family members may receive such information in special cases related to mental illness or other chronic diseases, so that the patient receives the proper care at the right time.²⁷ However, such disclosures are considered serious barriers to maintaining the privacy of information.

Lastly, certain medical aspects also create barriers to maintaining the privacy and confidentiality of medical information.³⁸ Various medical data need to be collected and updated every year in order to manage various diseases and their consequences to the health of the people in a region or country. A summary of the key viewpoints of various authors regarding the barriers faced by the healthcare information system is as follows:

- The major barriers to maintaining the privacy of healthcare information are ethical.³²
- However, another study³⁵ have stated that various legal issues pose the most significant barrier to the privacy and confidentiality of patient information.

However, in the US, for example, social and medical factors act as major barriers to the implementation of the privacy of health information. Thus, the views presented^{37,} ³⁸ are much more relevant in the case of the US healthcare information system, as they focus on medical and social factors.

Concerns over Information Privacy in Saudi Arabia

Whether it is viewed as a right or a commodity, patient privacy is one of the ultimate goals of healthcare systems.³⁹ Yet, as we have seen, due to the challenges posed by advanced technology, patient privacy can be compromised, and therefore, it is the duty of the healthcare organization to deal effectively with concerns involving information privacy. For example, in Saudi Arabia, the implementation of e-health services is dependent on knowledge barriers. The first type of knowledge barrier is technological, in that employees lack the training to carry out technical tasks.¹⁷ A second knowledge barrier is organizational, and is related to the lack of a national information standard for

information privacy and code sets.¹⁷ If these barriers are overcome, the patient's right to privacy can be improved in terms of comprehensibility and control.

Moreover, due to the fast pace of change in ICT, Saudi Arabians are confronted by a number of issues in the implementation of e-services.¹ Saudi Arabia is inexperienced in internet use, because the country missed the formative stage of the internet in 1995.¹ As a result, Saudi Arabia's aging infrastructure may not always be compatible with eservice options. Not only does this affect privacy and security adversely, but it also compromises the quality of e-service.²¹ Therefore, major concerns over privacy in Saudi Arabia extend to the ability to proliferate and maintain online data resources in an efficient manner.

Further, the organizational barrier of e-service discussed above can lead to problems associated with the control of information privacy. It has been reported that automated systems are necessary for the transmission of electronic networks, but as a result, society "becomes more vulnerable to poor systems design, accidents that disable systems, and attacks on computer systems".⁴⁰ Thus, in addition to problems caused by users of healthcare systems, the computers themselves can exhibit technical difficulties that disrupt the flow of patient data.

In quality healthcare information systems, it is crucial for data to be accessible by authorized personnel, and to be accurate and secure. Methods to ensure accuracy and security include:

Technical security measures to prevent unauthorized access include encryption in the transmission and storage of data; limits on access through the

use of passwords; and the storage of data on secure servers or computers that are inaccessible by modem.²⁰

Thus, with the aid of technical security measures, there can be a brighter future in the control of the privacy of patients in Saudi Arabia.

Culture and Healthcare in Saudi Arabia

It has been posited that the cultural values of individuals in societies exhibit a complex set of patterns for social interaction, communication, and exchange ¹¹. As such, many challenges emerge due to the influence of effective communication in diverse environments where knowledge sharing and resource transactions are the responsibilities of organizations. As a result, these new environments cause the operation and performance of organizations to be characterized by unpredictable, continuous changes.¹⁴ Hence, Saudi culture affects health organizations because of values held by Muslims in this Middle Eastern society.

As the new, technologically advanced environments in hospitals continue to develop, some of the values of Saudi culture tend to create barriers. One study ascertained that a main cultural barrier is the gap between employees' technical literacy and authentication tasks.¹ The effects of culture also influence patients in hospital settings. One study demonstrated that, given the same services, individuals in Saudi culture have lower expectations of medical care than do people in other countries, such as Austria.¹⁶ Moreover, Arabic culture has often been referred to as a "contact culture," in which individuals prefer personal contact to rules and procedures.¹¹ These findings suggest that people in Saudi Arabia are culturally sensitive and react to healthcare services in various ways depending on their beliefs and attitudes.

Despite its cultural challenges, Saudi society has a well-developed and structured healthcare system. Most of the healthcare facilities are government-operated, and patients receive prescriptions from 3,200 privately owned pharmacies. Yet, most individuals in the region do not trust the pharmaceutical industry due to: 1) lack of professionalism; 2) commercial pressures on local pharmacies, and 3) lack of governance of pharmacy practices.³ Thus, the different environments of Saudi Arabia's healthcare system are each under the influence of individuals' cultural values.

It follows that another issue of importance to Saudi Arabia's healthcare system is the cultural relativity of the concept of privacy. It has been said that Saudi culture does not yield to the foreign regulation of a domestic setting or environment. For example, even though the Western world considers privacy one of the human rights, Saudi Arabians are not yet ready to embrace this regulation. Further, Western countries, such as the US, adjust their regulatory frameworks according to the separation of church and state. In contrast, Saudi Arabia integrates Islam into its healthcare system.²² Therefore, cultural relativity is a crucial factor in the exchange of information via the well-structured healthcare system within Saudi society.

Saudi Society and its Healthcare System

Saudi society has been classified as one that is highly contextual, such that individuals use oral communication that is filled with metaphors, analogies, and storytelling. In the healthcare setting, this preference requires communications that engage the imagination.¹¹ Hence, the designers of IT for Saudi healthcare systems can contribute to the effective use of new technologies used in patient applications. Saudi society spent billions of Riyals on the development and improvement of its healthcare system by expanding its coverage. However, due to this rapid expansion, a variety of healthcare providers emerged that led to variations in administration, financial management, and IT. This caused a crisis in creating an organized health record system.¹⁷

For the past 30 years, in attempts to improve the quality of medical care provided in Saudi society, the country has established government hospitals, private hospitals, and medical centers that handle sophisticated medical procedures, such as cancer therapy, open-heart surgery, and kidney transplants.¹⁷ Hence, the adoption of the information revolution was realized by the millennium when there was a "drive towards knowledge formation".¹ As a result, by 2005, the Saudi government established an e-government directive for the Ministries of Finance, Communications, and Information Technology.¹

In examining patient satisfaction, one study grouped the components of healthcare services into the following dimensions: communications (i.e., doctor-patient interactions); physical environment; consultation time; waiting area environment and privacy, staff attitude; activities and procedures; outcomes of care, and waiting time.⁷ These authors also stated that more emphasis should be placed on the doctor-patient relationship than on the accessibility of healthcare services. Further, patients' expectations have a strong and direct relationship to their levels of satisfaction. This suggests that hospital staff must perform their duties ethically and efficiently in order to meet consumer demands for quality. In Saudi Arabia, it was also found that older patients express higher levels of satisfaction than younger patients do.⁷ These findings suggest a generational influence in the attitudes of Saudi patients.

In order to understand Islamic patients better, healthcare professionals need to consider the communication practices and styles of these men and women. Arab clients

usually display formal communication patterns that are restrained and impersonal. According to Al-Krenawi⁴¹ "(These) clients may use a variety of ethno-specific idioms of distress...They may describe a depression as 'a dark life,' or their fear by saying 'my heart fell down'" (p. 10). By understanding the ways in which Muslim patients communicate, doctors and nurses can handle medical situations quickly and efficiently.

Another major societal concern in this country is religious faith and beliefs. As aforementioned, the Muslim way of life is consumed by its religious observances. Islamic patients near death must be attended in key stages. First, the dying patient must be joined by another individual who reads to him/her from the Quran. Further, the patient must die facing the holy mosque in Makkah, (i.e., Mecca), and, finally, s/he must die in a holy place or at a holy time.⁴² Because Muslims consider doctors to be in positions of authority, they defer to treatment plans for healing or preparation for death.

Religion and Healthcare in Saudi Arabia

Saudi Arabians follow the faith of Islam, one of the fastest growing religions in the world. "Islamic belief is based on the revealed word of God to the Prophet Muhammad".¹³ Following the scripture of the Quran, Muslims abide by the five pillars of the Islamic faith, as follows: 1) affirmation that God is the only God and Muhammad is His prophet; 2) observation of five daily prayer rituals; 3) giving alms to the poor; 4) observance of Ramadan, and 5) the religious pilgrimage to Mecca.¹³ All branches of the healthcare discipline must handle Islamic patients in Saudi healthcare facilities. From primary and nursing care to mental health and social work settings, there are a plethora of branches in medicine that are affected by individuals' religious views. It is apparent that the quality of healthcare delivery in Saudi Arabian hospitals "calls for promoting health professionals' awareness of the religion of Islam".⁴³ The Islamic faith supports the treatment of the sick, and some of the most widely used options for treatment are modern medicine, spiritual healing, and traditional healing practices.⁴³ The practice of Islam is more than just a religion to its followers, it is a way of life that encompasses everything from birth and marriage to family and politics.¹² For this reason, health professionals, such as nurses, must provide competent care that incorporates patients' religious beliefs and cultural attitudes into the plan of care.¹² For example, in contrast to Western culture, patients in Saudi Arabia are treated according to, "the family, extended family, community, or tribal background," not according to the individual.⁴¹ Thus, doctors and nurses must be careful to acknowledge the customs of these Muslim patients.

The health environment in Saudi hospitals tends to support notions of privacy, as well as those of religion and culture.⁵ The inclusion of spiritual and cultural artifacts in patients' rooms helps to make them comfortable during treatment. Thus, designers of patient rooms and healthcare facilities overall must consider Islamic and cultural beliefs in order to relate to patients' identities.⁵ Muslim traditions require high degrees of privacy; for example, both Muslim women and men prefer to cover their body parts. In addition, Muslim patients usually have a large number of visitors because of the Islamic teachings that encourage visits to the sick and needy. The treatment of the mentally ill also requires special concerns about the healthcare facility. "In Saudi Arabia, the popular view is that mental illness is the punishment of Allah or [is] inflicted by evil spirits".⁶ Thus, the

privacy of housing and treatment of these patients depends on belief in the Quran, as well as Sharia, a set of Islamic laws and principles.

In terms of suffering, most Muslims consider pain as atonement for sins.⁴² Thus, healthcare professionals must be trained to understand Islamic patients' beliefs in hospitals, where they gain the rewards of treatment. Yet, as healthcare can be an aid in healing the sick, it is not possible to save every life. In these cases, Muslim patients who are terminally ill prefer to leave the hospital and die among their loved ones.⁴² Moreover, the relationships between healthcare professionals and patients may be stressful because of the patients' adherence to Islamic practices, such as prayer five times a day.¹⁵ Other practices, including diet and pilgrimage (i.e., Hajj) requirements also can affect the quality of care received by Muslim patients. Planning for Islamic processes is paramount in Saudi hospitals, as it benefits the cooperation of the medical staff and the healing or dying of the patient.

There is a substantial difference between what most Westerners view as attractive or "must be" in the health setting, compared to what Saudi patients consider "onedimensional." This indicates differences in cultural and religious preferences. It has been noted as well, "There is also a tendency in the Gulf culture to respond in a positive and hopeful fashion whenever they think that a negative or demanding answer may put them in trouble with the authorities".¹⁶ By understanding Islamic faith, one can easily see the need for ethical and professional behavior from caregivers, whatever their own religious affiliations may be.

It follows, therefore, that a major function of doctors and nurses is to understand Islamic religious practices. Knowing this, caregivers can accommodate the needs of
patients more effectively, as they seek to follow religious roles successfully while hospitalized. Because it is impossible to separate religious and social roles in Islamic society, hospital staff should be held accountable for provisions that facilitate religious practices.

Privacy for Islamic Women in Healthcare Settings

Like their male counterparts, Muslim women expect to have privacy while hospitalized. Yet, unlike men, women deal with issues that require special treatment, such as pregnancy and childbirth. Healthcare professionals in Saudi Arabia try to persuade Muslim women to avoid at-home deliveries, which can be dangerous when untrained attendants are used.⁴⁴ In Saudi Arabia, the population has exhibited a great number of marriages in recent years.¹⁴ and this has led to a large number of babies in the region who must be cared for properly.

A study of inpatient satisfaction with physician services at King Khalid University Hospital, Riyadh, Saudi Arabia found that female inpatients were more satisfied with their physicians due to the greater courtesy that they received from them. Moreover, Saudi doctors usually show more courtesy toward women due to cultural etiquette. In some cases, the sex of the physician also influences patient satisfaction. Female patients usually feel more comfortable in the care of female physicians.⁴

In terms of e-service in Saudi Arabia, women tend to prefer and use the internet more frequently than men do, which helps women obtain information regarding health services and products.²¹ In so doing, Saudi women are better equipped than men are to seek out treatment for ailments and problems such as spousal abuse. The incidence of physical and emotional abuse of women in Saudi society has been found to be greater than was once believed.⁴⁵ Public healthcare centers (PHCC) were the main settings used in their study because they have been demonstrated to build stronger relationships among staff and female patients, which leads women to report higher numbers of cases of abuse.

Despite the improvements in healthcare for women, "Ethnic Arab women, particularly in Muslim society, have been viewed as 'powerless, subservient, and submissive".⁴¹ As a result, male dominance in the household, the economy, and the polity can have an adverse effect on women's roles in the communities. Some Saudi women find that marriage and childrearing are the only ways to gain status in society.⁴¹ While the husband takes on the role of authoritarian in the family, the wife becomes the moral teacher for the children.¹² Thus, when seeking medical advice, both parents must come to an agreement. For example, by observing Muslim women's honor and chastity, healthcare professionals ensure that they are taken care of well and that their husbands are allowed in the room during examinations.¹² Hence, due to the cultural beliefs and religious rituals of Islamic women, healthcare providers must follow precautions before and after treatment of these patients.

Satisfaction of Islamic Patients in Saudi Arabian Hospitals

From the models discussed earlier, it is clear that the patient as a customer expects to be provided with quality products and services. One extension of the healthcare system is the pharmaceutical industry. It has been said that the advancement of the pharmaceutical industry depends on professionals who understand the needs and expectations of patients. Thus, it is the responsibility of pharmacists to recognize those needs, improve their services, and increase customer satisfaction, as pharmacy customers appreciate the advice of the pharmacist when making decisions.³ Consumer attitudes are very influential in the flow of information to and from medical staff.

Another extension of the Saudi healthcare system is mental health services. Many researchers have studied the effects of mental health and social services on Muslims' satisfaction ratings.⁴¹ Their findings have shown that healthcare professionals must differentiate knowledge and skills when handling patients of Arab ethnic origin. Dedicated to their Islamic communities, Muslim patients are "immersed in the broadest spectrum of traditional to modern norms and values".² By setting guidelines, mental health providers must adjust their services based on the cultural requirements of their patients. For example, in Muslim society, mental health problems are viewed as social stigma, especially for women. Thus, social workers and doctors need to work together to create non-stigmatizing frameworks or physical settings to serve Muslim patients in privacy.⁴¹

Mental health interventions for Muslim patients also must be made in the context of the family and the community. Unlike Western societies, Muslim societies tend to be communal or collectivist rather than individualistic. Thus, doctors who treat Muslim patients with mental health issues must intervene carefully so that the patients' family values are observed. "Individuals' interests unite with those of their group of allegiance, and the general good supersedes the personal".⁴¹ Therefore, because family involvement is inevitable, patients and doctors have meetings to address mental health problems.

Another study of inpatients at the King Khalid University Hospital illustrated the facets of medical services related to customer satisfaction.⁴ The author found that in most cases, healthcare included the following dimensions: "reception, admission and discharge

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procedures; housekeeping; sanitation; nutrition services; nursing, and physician-led services" (p. 359). Although patients depend on doctors for their knowledge and expertise, patients' perceptions of the quality of medical care are also dependent on their personalities and other defining characteristics; further, he found that the performance of physicians led to satisfied inpatients.

Similarly, a study was conducted to discern patients' levels of satisfaction with primary healthcare services in Saudi Arabia. After conducting interviews of patients in the community of Qateef, East Saudi Arabia, the researchers learned that the three areas that caused the most concern for patients were the waiting area structure, confidentiality measures, and environmental structure. On the other hand, these same patients were satisfied with the following factors: type of primary healthcare center building; status of household head, and the extent of primary healthcare center use.⁷ Although this study did not claim to be comprehensive, it did shed light on the matter of patient attitudes about the healthcare facilities in which they receive treatment. This provides evidence that when individuals are satisfied with the structure of a medical facility, they are more likely to continue to use it. Consequently, there is a plethora of patient, staff, and facility factors that affect an individual's level of satisfaction with medical treatment on a continual basis in the Muslim community.

Saudi Privacy Regulations

Chapter Five of the Basic Law of Government for Saudi Arabia includes a plethora of stipulations concerning rules and regulations for the privacy matters of the people.^{51, 52} The State takes the position of authority in holding that the Islamic Creed is maintained by the application of Sharia.^{51,52} In Article 27 of the Basic Law, it confirms

that the State will guarantee the rights of individuals in the cases of emergency, illness, disability, and old age. Further, Article 31 states, "The State shall look after public health and provide healthcare for every citizen".^{51,52} In terms of the protection of privacy in the aforementioned cases, the Basic Law ensures in Article 40 that modes of communication will remain safe and secure. This Article emphasizes that "There shall be no confiscation, delay, surveillance, or eavesdropping except in cases provided by the Law".^{51,52}

Similarly, to serve and protect the citizens of Saudi Arabia, the Anti-Cyber Crime Law was enacted in 2007. Some of the crimes listed against which the Law protects its citizens include unauthorized access and cyber crime, which is comprised of "any action which involves the use of computers or computer networks, in violation of the provisions of this Law." The main purpose of this law is to enhance information security; protect legitimate rights of computer users; protect public interest and values; and protect the national economy. Any person(s) violating the law is (are) subject to imprisonment and a fine.²³

HIPAA Regulations

Enacted in the US in 1996, the Health Insurance Portability and Accountability Act of 1996 (HIPAA) is Public Law 104-191. The primary purpose of HIPAA is to administer national standards for "the electronic exchange, privacy, and security of health information".⁴² Health information entails any information that is created or obtained by "a healthcare provider, health plan, public health authority, employer, life insurance company, school or university, or healthcare clearing house".⁴³ Also, health information can be obtained in three forms: written, electronic, and oral.

In the US, the Office for Civil Rights (OCR) imposes the HIPAA Privacy Rule. This rule ensures the privacy of individually identifiable health information, and implements US protocol for the security of electronically protected health information. OCR also oversees the HIPAA Breach Notification Rule, "which requires covered entities and business associates to provide notification following a breach of unsecured protected health information".⁴⁴ HIPAA only refers to some patients, and it covers the following entities: healthcare providers; health plans, and healthcare clearinghouses.⁴³

According to the HIPAA enforcement rule, the US Department of Health and Human Services' OCR has the authority to conduct investigations of HIPAA violations. The OCR then assesses civil monetary penalties (CMP) designed to prevent such violations. Thus, US state attorney generals can enforce HIPPA regulations. Contrary to popular belief, "individuals do not have a private right of action under HIPAA and cannot sue for a violation".⁴³ According to the US Congress, (2007), approximately 34 rules related to IT have been enacted in the healthcare systems of 34 states. In these healthcare systems, three laws have been implemented by the US Congress—the Health Information Privacy and Security Act (US Congress, 2007a), the National Health Information Technology and Privacy Act 2007 (US Congress, 2007b), and Technologies for Restoring Users' Security and Trust in the Health Information Act (US Congress, 2008). The main purpose of establishing these laws is to improve the information technology system so that patient information cannot be accessed by unauthorized persons.

Table 1 below presents the covered and non-covered entities in which HIPAA is implemented.

Table 1: HIPAA Covered and Non-covered Entities

Covered Entities		Non-Co	overed Entities
•	Health maintenance organizations (HMOs)	•	Independent consent management companies
•	Group health plans	•	Contract research organizations
•	Medicare and Medicaid programs	•	Research foundations
•	Veterans healthcare program Civilian Health and Medical Program of the Uniformed Services Indian Health Service program under the Indian Healthcare Improvement Act Pharmacies Researchers who are employed by a	•	Data warehousing/data management companies Student health services (if they do not bill for services) Pharmaceutical companies Researchers who are not employed by a covered entity Some universities (or parts of
•	Some universities (or parts of universities, such as health centers) A public health clinic that is part of a public health agency	•	A public health agency that does not perform activities subject to the provisions of the privacy rule

Source: National Academy of Sciences (2009).

HIPAA Legal Issues

Understanding the HIPAA privacy law demands a clear perspective of the legal issues surrounding its implementation. The legal issues surround the use of technology, photography and the application of various specific regulations in the medical context. The photographical legal discussion in medicine revolves around copyright law, featuring rights of ownership and restrictions on privacy when taking medical photos.⁵³ Health Insurance Portability and Accountability Act (HIPAA) regulations are used in protecting

the clinical data of the patient.⁵⁴ With the adoption of technology in the clinical setting, the use of e-mail among physicians features among the potential legal issues with serious ramification with regard to patient care.⁵⁵ With the prospect of new generation EHRs emerging, further legal issues relating to privacy and access are bound to emerge.⁵⁶ These issues may also hinder the advancement of these systems. Social media usage in medicine is also faced with potential legal issues, which need remedial responses to comply with current laws, while not exposing physicians to medical malpractice.⁵⁷ In the meanwhile, many practices continue paying heavy fines due to the failure to comply with HIPAA rules.⁵⁸ The application of legalities in normal healthcare setting may be easy, but it becomes complicated within correctional settings. Failure to comply with the federal Confidentiality of Alcohol and Drug Abuse Patient Records laws becomes common due to the minimal use of technology.⁵⁹ However, there is often a need to distinguish between the legal issues surrounding research and the provision of clinical care. Researchers must make efforts towards the provision of suitable outcomes, and understanding the caveats associated with each outcome presentation.⁶⁰ This distinction affects the manner of result application in the clinical setting. As health technology becomes applied in various medical areas, it becomes critical to examine how technology might fit into existing legal frameworks regarding regulatory and civil liability, especially in relation to the Health Insurance Portability and Accountability Act (HIPAA) of 1996.⁶¹ This condition requires that future developers of technology for medical use comply with state and federal laws, including the HIPAA Act and variations in disclosure requirements based on 42 CFR Part 2 on substance abuse confidentiality.⁶²

HIPAA Ethical issues

Ethical issues relating to HIPAA's control of technology use feature areas on privacy, transfer of information and the provision of standardized HER content. It is necessary to indulge in a collaborative effort that will identify the most urgent prerequisites for the use of EHRs, in order to maintain ethical provision of population health needs.⁶³ As variations in technology emerge, patients and families are more likely to record and store events surrounding the provision of medical care. The health care provider may be faced with an ethical dilemma when social media is used in the emergency department.⁶⁴ Concerns have also been raised about the use of personal information by commercial enterprises operating in the internet and mobile space.⁶⁵ These concerns mostly feature interests on privacy, and the release of de-identified data. According to research, it is evident that the current law is insufficient to cover ethical issues on technology use, especially regarding the recording of patient data and their personal information.⁶⁶ The reviewing of ethical practices demands that the forensic psychiatrist gain an understanding of the digital language that may generate controversy.⁶⁷ It is essential that the practitioner maintains their duty to avoid causing harm to the patient, which could take any form of emotional distress such as accidental loss of information.⁶⁸ Thus, in order to diminish patient and practitioner anxiety, it is essential that trusted back-up methods exist; rather than relying on features like hard drives carried by doctors.⁶⁹ In addition, practitioners applying technology in areas such as child-birth records require understanding the need for privacy and self-determination of their patients.⁷⁰ Such areas may be sufficiently accounted for, but loopholes exist in medical practices like tissue research. There is no single regulatory or bioethical standard that covers research with FFPE tissue specimens, making it difficult to prepare protocols involving research and evaluation.⁷¹ As EHRs become a dominant part of medical practice, protocols on research and the disclosure of medical information are becoming more complicated and exerting more pressure on ethical practice.⁷²

Current Technology Issues with HIPAA

It is possible to balance the integrity of the historical record of sensitive documents, while supporting the privacy protections of HIPAA in modern technology.⁷³ It is expected that the ethical demands on medical practitioners should drive them to do no harm. Today, medical practice faces the challenge of adopting safe and effective approaches with the ethical application of technology.⁷⁴ While personal health applications can improve health, they raise complex questions on patient privacy and security. According to studies, professionals making use of technology in areas such as social media application require careful consideration of patient rights and professional boundaries.^{75, 76} Even in the presence of technology, the privacy of the patient also diminishes considerably during consultation hours. Typically, a procedure like an ENT consultation experiences minimal privacy due to diminished application of technology to minimize sound articulation.⁷⁷ While technology is recognized as potentially improving patient outcomes in this regard, Houston (2010) elaborates that it can form "part of national system of data exchange allowing real-time analysis of disease trends, treatment use and effectiveness, and drug safety monitoring."⁷⁸ Remarkable progress has been made in research following new technology, such as studies on gene development.⁷⁹ However, while such databases are becoming integral in the advancement of research, their application is contingent with the development of measures to protect patient privacy.^{80,}

⁸¹ Part of these measures includes the application of Red Flag guidelines, which protect the patient and practitioner from identity theft and the overcoming of assumptions regarding technology use in medical practice.^{82, 83}

HIPAA Expected Future Issues

While technology already poses challenges and prospects in the application of HIPAA, there are issues that may vary in the future. The future of medical technology will be defined by big data, making it but an imperative that must be understood and used effectively in the quest for new knowledge.⁸⁴ Based on current research, it is expected that future technology in the medical field will improve future epidemiologic research by providing more comprehensive data.^{85, 86} As such, the development of future applications resembling current approaches like mHealth remains highly likely.^{87, 88, 89} These applications, however, will come with a demand for increased scrutiny of data privacy.⁹⁰ Current studies establish that the use of wearable devices may not bear sufficient secrecy to sustain the data transfer in the future.⁹¹ As such, the distribution of patient data may have to resort to traditional means, or the development of upgraded technology that enhances privacy and diminishes the possibility of data theft.^{92, 93} This feature poses the implication of future advancements in technology focusing not only on maintaining the HIPAA laws, but posing a challenge for the development of additional regulations.⁹⁴

HIPAA Barriers and Usability

Although the intention of HIPAA was to protect the privacy of patients, it has had unintended consequences for facilities.^{95, 96} The greatest barriers, according to common perception, include the increase in the public's misunderstanding about the release of patient information.^{97, 98} In addition, there is a notable absence of an overall policy or law, which defines the enforcement of regulations related to HIPAA.⁹⁹ This feature is especially dominant in areas regarding sharing of data and the use of modern technology. As such, the current nature of the HIPAA regulations, in the midst of advancing technology allows individual institutions to make their own interpretations of the law.¹⁰⁰ In addition, the ACT poses challenges to health information management professionals. This challenge is especially with regard to the control of safeguards related to the release of patient information.¹⁰¹ The transition to electronic health records has been characterized by increased involvement of information technology in task completion, making the implications of HIPAA capable of extending to the point of interrupting quality provision of healthcare.¹⁰²

CHAPTER 3

METHODOLOGY

This study describes the effect and the relationship between religious cultural factors and the privacy of health information in Saudi Arabia. The study targeted only three professional groups in order to make the study more structured. The groups selected comprise those that are involved most directly with the privacy of health information. The reason certain groups were chosen for this study was that there are no special policies and regulations for health information privacy and the public, such that most people remain unaware of the issue. The need to assess the quality of improvements made in the country's health services also informed the study.

Cultural Factors

Because 100% of the Saudi population is Muslim, this study chose to identify professionals with similar religious cultural values.¹⁵ In addition, the constitution and system that govern the county are based on Islamic rules.¹⁵ Consequently, developing countries encounter cultural and social obstacles when they attempt to transfer technology created abroad into practice at home.²⁵ The culture of a country or region affects the acceptance of technology greatly through its beliefs and values about modernization and technological advancement.²⁵ This study will explore how the Saudi/Islamic culture affects the maintenance of the privacy, confidentiality, and security of health information.

The Sample

The sample selected for this study was drawn from the population of three professional groups in Saudi Arabia. This study chose representative members from the fields of information technology, medicine, and law, because all three are related to health information services.

Procedures

The initial target number for the sample was 300 participants.

The study used the following steps for data collection:

- Permission to conduct the study was obtained.
- A survey containing information adopted from several governmental policies and regulations in the US and Saudi Arabia was designed.
- A link to the survey was sent and published through Saudi specialized groups in social networks in the fields of information technology, medicine, and Sharia law.

The target number of participants in the social networks method was 200.

- For the second group, volunteers were assigned to visit specialists in five Saudi regions (north, south, west, east, and central).
 a. The study targeted 20 participants from each region.
 b. There were a total of 100 targeted participants for the sample.
 - o. There were a total of 100 angeled participants for the samp
 - c. A tablet device was used in this method.
- 201 responses were obtained, for a response rate of 67 %.
- The time frame for participation was three weeks.

Instrumentation

An online survey was constructed that began with multiple-choice responses to basic demographic questions, such as nationality, profession, professional specialization, gender, age, marital status, income, and geographic location. The sections that followed contained statements and questions regarding survey variables; these had multiple-choice statements and also Likert scale questions that ranged from 5-8 points.

The survey was designed to gauge the responses of participants on the topics of awareness, confidentiality, accountability, regulations and policies, and religious cultural background. The survey was created with information adopted from several governmental policies and regulations in the US (HIPAA) and Saudi Arabia (cyber-crime law and basic governmental law). Specifically, the survey sought to obtain data that would illuminate participants' perceptions of how religious culture affects the privacy of health information in Saudi Arabia.

Description of the Variables Used

Culture/Religiosity

Because Islam is the religion practiced by all citizens.²⁵ in Saudi Arabia, and a society's religiosity helps to define its cultural values, a predominant number of the survey questions dealt with participants' religiosity as it related to their personal and family-based practice of Islam.

Awareness of Health Information Privacy

Showing a noticeable level of concern is an important factor when measuring individuals' awareness. This measure of participants' awareness was based on answers to survey questions that dealt with background information on privacy.

Confidentiality

The measures of confidentiality were based on survey questions about healthcare workers' requirements that restrict certain kinds of behavior, such as tampering with patient information. Further, questions were included about the use and disclosure of health data for the purpose of research.

Accountability

Participants were asked questions about specific standards. By doing so, the study was able to gauge the participants' knowledge of the techniques used by healthcare organizations to protect patient information.

Regulations and Policies

In Saudi Arabia, there exist new, independent standards and regulations that protect the privacy of information.⁴⁹ Due to these regulations, the country imposes heavy fines on healthcare facilities that violate them, with additional penalties up to imprisonment for perpetrators ("Chapter 5," 2014). The measure of this variable was obtained by asking participants what they knew about standards set by Saudi Arabia to protect the privacy of information.

Pilot Study Results

A questionnaire was sent by email to 30 selected Saudi professionals. Eighty percent of the professionals responded and completed the survey in a one-week period; the pilot study was well organized and could be conducted efficiently, so that it produced a high quality dataset. The instrument also discriminated well among the variables. Further, the participants had no difficulty obtaining the survey via email and returning it in a timely manner. Changes to the instrument that improved the results of the pilot test included.

Overall Analysis

This study developed a modified TAM-based model of the actual adoption of the privacy of health information (Figure 1) that suggested that the external factors of culture/religiosity and awareness of health information privacy predict internal factors of behavioral intentions to maintain privacy, which include confidentiality, accountability, and regulations and policies.

For the purposes of the study, the survey constructed assessed each of the dimensions of behavioral intentions to maintain privacy, as well as culture/religiosity, awareness of health information, and demographic variables. Confidentiality was calculated as the sum of the 8 Likert scale items designed to assess the variables above (possible range 8-40). Accountability was calculated as the sum of the 3 Likert scale items designed to assess the variables (possible range 3-15). Regulations and policies were calculated as the sum of the 11 Likert scale items designed to assess the variables (possible range 11-55). Awareness was calculated as the sum of the 17 Likert scale items designed to assess the variables (possible range 10-91). Religiosity was calculated based

on the sum of 2 Likert scale items designed to assess the frequency with which respondents read the Quran, and how much they read, plus a family religiosity variable (possible range 1-13).



Figure 1: Modified TAM Model

Analyses

- 1. Coding
 - a. Recode data to Likert scales.
 - b. Calculating variables
 - 1. Justify cultural factor (religiosity) coding
 - 2. Sum variables to calculate each of the 5 variables
 - i. Y = confidentiality, accountability, regulations
 - ii. X = culture/religiosity
 - iii. Mediator = awareness
- 2. Descriptive statistics
 - a. For each of the 5 variables
 - 1. Means
 - 2. Standard deviations
 - 3. One-way ANOVA
 - i. The differences across groups (IT, law, medical)
- 3. Inferential statistics
 - a. Correlations
 - 1. Are the variables correlated significantly?
 - i. This is a requirement of mediation analysis
 - b. Mediation analyses (3 will be conducted, one for each Y)
 - 1. Multiple regression
 - i. Y = outcomes variables (confidentiality, accountability, regulations)
 - ii. X = culture/religiosity
 - iii. Mediator = awareness

Mediation analyses

Mediation analyses were conducted for each of the outcome variables (confidentiality, accountability, and regulations). Mediation analysis is a four-step process. The first three steps establish significant relationships between each pair of variables. If these correlations are not significant, then the mediation analysis is not valid.⁵⁰ These steps can be outlined as follows:

- 1. Finding whether religious culture correlated significantly with each of the privacy variables (Simple correlation)
 - a. There must be a significant correlation between religious culture and outcome. If this is not significant, then there is no relationship to mediate.
 - b. If this step is not significant, then the mediation analysis is discontinued.
- 2. Is religious culture correlated significantly with awareness? (Simple correlation).
 - a. There must be a significant correlation between religious culture and awareness. If this is not significant, then these variables are not related.
 - b. If this step is not significant, then the mediation analysis is discontinued.
- 3. Is awareness correlated significantly with outcome variables? (Simple correlation).
 - a. There must be a significant correlation between awareness and the outcome variables.
 - b. If this step is not significant, then the mediation analysis is discontinued.
- 4. Is awareness a significant mediator of the relationship between religious culture and outcome variables? (Multiple regression)

a. A multiple regression was conducted to predict the outcome variables with the variables of religious culture and awareness.



Figure 2: Meditation analysis diagram

CHAPTER 4

RESULTS

Professions Response Rate

Table 2 shows the response rate for the respondents from the three professions targeted in the study. The initial target number for the sample was 300 participants. 201 responses were obtained, for a response rate of 67%; medical professionals had the highest rate of return (45.3%), while law professionals had the lowest rate (23.9%).

Table 2: Response Rate by Profession

	Frequency	Valid Percent
Sharia and Law	48	23.9
Medical and health	91	45.3
Information Technology	62	30.8
Total	201	100.0





Education Response Rate

Table 3 shows the educational level of the respondents. 38.3% held a Master's degree, while only 2.0% held a medical degree (MD). 36.8% had a Bachelor's degree and 7.0% had graduated from high school.

	Frequency	Valid Percent
High school or equivalent	14	7.0
Some college, no degree	22	10.9
Bachelor's degree	74	36.8
Master's degree	77	38.3
Doctoral degree	5	2.5
Medical degree	4	2.0
Fellowship/Board	5	2.5
Total	201	100.0

Table 3: Response Rate by Education



Figure 4: Education level by gender

Gender Response Rate

The response rate of males and females in this study was 71.1% male and 28.9% female, as shown in Table 4.

	Frequency	Valid
		Percent
Male	143	71.1
Female	58	28.9
Total	201	100.0

Table 4: Response Rate by Gender



Figure 5: Profession by gender

Age Response Rate

As shown in Table 5, 66.2% of the respondents was 25 to 34 years of age;

17.9% were 18 to 24 years old, and 0.5% was over 45 years of age.

Age	Frequency	Valid Percent
18-24	36	17.9
25-34	133	66.2
35-44	30	14.9
45-54	1	0.5
55-64	1	0.5
Total	201	100.0

Table 5: Response Rate by Age



Figure 6: Profession by age

Regional Response Rate

Table 6 shows the response rate from the main regions covered in the study. 43.8% of the respondents were from the central region, 29.4% were from the western region, 10.9% of respondents came from the eastern region, and only 6.0% came from the northern region.

	Frequency	Valid Percent
North Region	12	6.0
South Region	20	10.0
Western Region	59	29.4
Eastern Region	22	10.9
Middle Region	88	43.8
Total	201	100.0

Table 6: Response Rate by Region



Figure 7: Profession by region

Descriptive Statistics

Table 7 presents the means, standard deviations, and range of scores for each of the predictor variables assessed in the study. Reliability was reported using Cronbach's alpha. This reliability coefficient is used to assess the internal validity of each of the scales based on the average correlations among items. The values obtained suggested that the scales used to assess confidentiality, accountability, and awareness demonstrated high internal consistency; however, Cronbach's alpha values for regulations and policies, and religious culture scales fell below the recommended level of 0.70.

Measure	М	SD	Range	Cronbach's	# items
				alpha	
Confidentiality	34.41	5.60	9-40	0.88	8
Accountability	13.20	2.15	4-15	0.84	3
Regulation & Policies	35.95	5.19	21-49	0.54	11
Awareness	49.83	12.79	17-82	0.83	17
Religious Culture	5.75	2.41	1-13	0.30	3

Table 7: . Means, Standard Deviations, Scale Range, Cronbach's Alpha , Number ofItems in Scale

Hypothesis Tests

Simple regression test of Hypotheses 1 and 2

The relationships among predictor and privacy variables as hypothesized and depicted in the modified TAM Model presented in Figure 1 suggest that religious culture influences the outcome variables both directly and indirectly through its influence on awareness. Thus, the relationship between religious culture and internal factors of behavioral intentions to maintain privacy was also hypothesized to be mediated by awareness of health information privacy. The purpose of a meditation analysis is to determine whether or not there is an underlying mechanism (3rd variable/mediator) that helps to improve our understanding of the relationship between the predictor and outcome variables. As indicated above, it is possible that religious culture predicts each of the

internal factors of behavioral intentions to maintain privacy both directly and indirectly by its effects on awareness (mediator).

Table 8 summarizes the simple correlations between the three components of behavioral intention (Y), religious culture (X), and awareness (M). The results indicated that the first and second criteria for meditational analysis (significant correlation between X & Y) were not met. Thus, religious culture was not correlated significantly with any of the three outcome variables or with awareness. Therefore, there was no significant relationship to mediate, and the mediator (awareness) was not related to the primary predictor (religious culture).

	Confidentiality	Accountability	Regulations	Awareness	Culture
	-	-	-		
Confidentiality					
Accountability	0.59*				
Regulations	-0.05	0.02			
Awareness	0.29*	0.24*	-0.02		
Culture	-0.11	-0.10	-0.01	-0.01	

Table 8: Correlations between Internal Factors of Privacy, Awareness, andCulture

* p < 0.05

Test of Hypothesis 3 with One-way ANOVAs

One-way ANOVAs were conducted to assess for differences across professions for each of the outcome and predictor variables (Table 9). No significant differences were found for accountability, or regulations and policies. Significant differences between professions were found for confidentiality ($F_{2,198} = 4.91$, p = 0.008), awareness ($F_{2,198} = 3.09$, p = 0.048), and religious culture ($F_{2,198} = 7.05$, p = 0.001). As indicated in the table, post hoc analyses indicated that medical professionals reported significantly higher confidentiality than did law professionals, but significantly lower awareness, and religious culture. Law professionals were also significantly higher in religious culture than were information technology professionals. No other pair-wise comparisons were significant.

	Profession					
-	Law (n=48)		Information Tech (n=62)		Medical (n=91)	
Measure	Μ	SD	Μ	SD	Μ	SD
Confidentiality*	32.50 ^a	6.39	34.21	6.25	35.55 ª	4.30
Accountability	12.83	2.39	12.90	2.40	13.60	1.76
Regulation & Policies	34.83	4.55	37.03	5.55	35.80	5.16
Awareness*	53.73 ^a	14.20	49.16	13.86	48.23 ª	10.82
Culture*	6.77 ^{a,b}	2.97	5.10 ^b	2.05	5.66 ^a	2.14

 Table 9: Comparison of Means, Standard Deviations in One-way ANOVAs across

 Professions

* One-way ANOVA significant p < 0.05

^a post hoc test comparison of Law and Medical significant p < 0.05

^b post hoc test comparison of Law and Information Tech significant p < 0.05

Because differences were found across professions for the predictor variables of religious culture and awareness, as well as the outcome variable of confidentiality (Table

9), it is relevant to conduct analyses separately for each profession to explore the question of whether religious culture and awareness are significant predictors of each of the outcome variables. Thus, simultaneous multiple regression analyses were conducted to predict each of the outcome variables: confidentiality (Y1), accountability (Y2), and regulations and policies (Y3) with awareness and religious culture. Analyses were performed separately for law, information technology, and medical professionals.

Multiple regression analyses for confidentiality across professions

Results of multiple regressions for confidentiality indicated that awareness and religious culture were significant predictors of confidentiality among law ($R^2 = 0.28$, $F_{2,45} = 8.59$, p = 0.001) and medical professionals ($R^2 = 0.15$, $F_{2,88} = 7.70$, p = 0.001). Table 10 displays the coefficients, which indicated that only awareness contributed significantly to the predictions for both law and medical professionals. No significant effects were found for those employed in information technology.

Profession	Predictor	β	t	р
Law	Awareness	0.50	3.96	< 0.001
	Culture	-0.14	-1.07	n.s.
Medical	Awareness	0.36	3.63	< 0.001
	Culture	-0.14	-1.39	n.s.
Info. Tech	Awareness	0.24	1.84	n.s.
	Culture	0.13	1.02	n.s.

Table 10: Summary of Multiple Regression Analyses for Confidentiality

Multiple regression analyses for accountability across professions

Results of multiple regressions for accountability indicated that awareness and religious culture were significant predictors of accountability among law ($R^2 = 0.20$, $F_{2,45} = 5.55$, p = 0.007) and medical professionals ($R^2 = 0.11$, $F_{2,88} = 6.62$, p = 0.002). Table 11 displays the coefficients, which indicated that only awareness contributed significantly to the predictions for both law and medical professionals. No significant effect was found for those employed in information technology.

Results of multiple regressions for policies and regulations indicated that awareness and religious culture were significant predictors of policies and regulations.

Profession	Predictor	β	t	р
Law	Awareness	0.45	3.33	0.002
	Religiosity	0.01	0.04	n.s.
Medical	Awareness	0.31	3.08	0.003
	Religiosity	-0.18	-1.82	n.s.
Info. Tech	Awareness	0.20	1.95	n.s.
	Religiosity	0.04	0.04	n.s.

 Table 11: Summary of Multiple Regression Analyses for Accountability

CHAPTER 5

DISCUSSION

Introduction

This study addressed the effects of religious cultural factors on the privacy of healthcare information in Saudi Arabia. By focusing on the responses of three professional groups that have connections to healthcare information, the study was able to achieve its purposes. Further, the study was concerned primarily with the quality of improvements made in Saudi Arabia with regard to healthcare services. Because Saudi Arabia is a Muslim state, the study chose to enlist professionals who were familiar with the country's religious cultural values. Thus, it was the researcher's intention to explore how religious culture affects the acceptance of technology in Saudi Arabia hospitals.

Looking at the variables of the study, one can focus first on confidentiality. The concept of confidentiality is important in patient care, because it allows patients' information to remain secure; thus, several survey questions were devised to measure confidentiality. For example, questions referred to healthcare worker requirements that prohibit tampering with patient data. Further, subjects in the study were asked about disclosure of health information for use in research studies.

With regard to regulation variables, the study developed survey questions on the participants' knowledge of Saudi standards designed to protect the privacy of information. Saudi Arabia has many newly instated regulations for the protection of patient information, and their violation is punished severely

The research subjects also had to answer questions regarding accountability. In doing so, they revealed their knowledge of the accountability standards upheld by healthcare organizations in Saudi Arabia.

It was also necessary to gauge the subjects' levels of awareness of privacy issues, which was addressed in another set of questions that dealt with information concerning privacy in Saudi hospitals.

The Islamic culture of the society was also considered very important, as it is a central factor in patients' lives. Consequently, the researcher developed survey questions that concentrated on the research participants' levels of religiosity.

Influence of Religious Cultural on Privacy of Health Information

It was hypothesized that religious culture and awareness would have significant effects on privacy variables. However, this hypothesis was not supported, as there was no direct relationship between religious culture, awareness, and privacy. In fact, surprisingly, religious culture and awareness did not correlate with any outcome variable. Accordingly, one can discern that the religious culture and awareness of patients does not affect the level of privacy.

The Relationship between Religious Culture and Privacy

It was hypothesized further that the relationship between religious culture and privacy would be mediated by awareness. However, the results showed that there was no significant correlation between religious culture and the intention to maintain privacy. Thus, religious culture was not correlated significantly with any of the three outcome variables, or with awareness. Furthermore, as there was no significant relationship to mediate, the mediator (awareness) was not related to the primary predictor, religious culture.

The Variance and Effect on Related Professions

The third hypothesis argued that people in different professions would differ greatly in their attitudes with respect to each of the privacy variables. Results of the multiple regressions for confidentiality indicated that both awareness and religious culture were significant predictors for law and medical professionals. The coefficients indicated that only awareness contributed significantly to the prediction for law and medical professionals. No significant effect was found for those employed in information technology.

It follows that the results of multiple regressions for accountability indicated that awareness and religious culture were significant predictors of accountability for law and medical professionals. The coefficients indicated that only awareness contributed significantly to the prediction among respondents in both professions; again, no significant effect was found for people employed in the information technology profession.

The multiple regressions for policies and regulations demonstrated that awareness and religious culture were significant predictors of policies and regulations. Similarly, there were significant differences for confidentiality, awareness, and religious culture. Those in medical professions showed higher degrees of confidentiality than did those in law professions. However, medical professionals exhibited lower degrees of awareness and religious culture than did their counterparts in law. The law professionals had higher levels of religious culture when compared to those in information technology professions.

Results of the multiple regressions for confidentiality demonstrated that both awareness and religious culture could be classified as significant predictors of confidentiality for law and medical professionals. The findings for policies and regulations indicated that both awareness and religious culture also were significant predictors of policies and regulations.
CHAPTER 6

CONCLUSIONS

Summary

By observation of the variables' descriptive statistics, one can conclude that the internal validity of the scales used was reliable. This demonstrates the consistency of the survey employed, especially for the factors of confidentiality, accountability, and awareness. On the other hand, the scales for regulations and religious culture were not consistent internally. Moreover, looking at the modified TAM model presented in this study, it becomes evident that religious culture influenced outcome variables, such as awareness, both indirectly and directly. The analysis also allowed identification of the relationship between these outcome variables and their predictors. Accordingly, it was found that religious culture did not have a significant effect on the following variables: confidentiality, accountability, regulations, and awareness.

Overall, the study ascertained that certain professions exhibit various factors to a greater or lesser degree. Specifically, people in the law and medical professions were more apt to be affected by measures, such as confidentiality and accountability, than were those in information technology. One major finding is that it is relevant to conduct analyses separately for each profession to explore whether religious culture and awareness are, indeed, significant predictors of each outcome variable.

Limitations

One of the major limitations of this study is the fact that it focused on only three targeted groups in Saudi Arabia. Therefore, it is very difficult to generalize the results. For example, it would be difficult to compare the results of this study with those in other countries, such as the US or Canada. Another limitation concerns education. In this study, the researcher focused on the survey responses of highly educated participants. Consequently, the responses cannot be generalized to a broader population. For example, if the study had included people with less education, the outcome variables may have been less predictable.

Recommendations

It is recommended that more studies be conducted on how religious culture affects privacy in healthcare facilities. Further, the examination of more variables might be valuable to new studies in this field. The separate study of each aspect of this research might also be useful to advance the field. For example, surveying healthcare professionals, rather than information technology professionals, might produce some interesting results. Further, one could consider surveying patients themselves, as these participants would offer a more complete view of how privacy affects those directly involved with medical treatment.

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Appendix A: Questionnaire

Cover Page

السلام عليكم و رحمة الله و بركاته ادعوكم للمشاركة في هذا الإستبيان لمشروع بحثي اقوم به حاليا وهو يعنى بدراسة تأثيرات الثقافة المجتمعية على خصوصية المعلومات الصحية في المملكة العربية السعودية لا يترتب على مشاركتم اي مخاطر، و لا تستغرق المشاركة في هذا الإستبيان حوالي عشر دقائق يتطلب هذا الإستبيان اي معلومات شخصية أو وسائل إتصال، الطب و التخصصات الصحية أو :يستهدف هذا البحث السعوديين المختصين بأحد هذه التخصصات تقنية المعلومات و الحاسب الآلي أو القانون و الأنظمة الشرعية

أثمن لكم وقتكم و أشكركم مقدما على المشاركة علما أن الإستبيان متاح باللغتين العربية و الانجليزية و أثمن ايضا دعوتكم لزملائكم المختصين لهذا الإستبيان حتى نصل للهدف الأساسي من هذا البحث للبدأ اضغط في الاسفل على Next

اخوكم طالب الدكتوراة سليمان المطيري Email: almutairi.s@rutgers.edu

You are being asked to participate in a research study that is being conducted by Sulaiman Almutairi. The purpose of this study is to discuss how culture affects the privacy of health information in Saudi Arabia. You will be one of approximately 300 subjects, You must be Saudi national and specialized in one of the following specialties; Health, Information Technology and Law or shria. You will complete a survey, which will take about 10 minutes to complete. Participation in this study is voluntary. The only alternative to this study is not to participate. No risks are anticipated from taking part in this study. If you feel uncomfortable with a question, you can skip that question or withdraw from the study altogether. If you decide to quit at any time before you have finished the questionnaire, your answers will NOT be recorded.

All information you provide will be treated confidentially. No link between the survey data and identity will exist. The researcher has put in place adequate protections for your privacy in that all information provided will be kept confidential.

Again, Your participation is voluntary; you are free to withdraw your participation fromthis study at any time. If you do not want to continue, you can simply leave this website.If you do not click on the "submit" button at the end of the survey, your answers andparticipationwillnotberecorded.

If you have concerns or questions about this research study, please contact me by email: almutairi.s@rutgers.edu

By beginning the survey, you acknowledge that you have read this information and agree to participate in this research, with the knowledge that you are free to withdraw your participation at any time.

Nationality:

1) Nationality*

 () Saudi Citizen
 () Non-Saudi Citizen

Profession:

2) Are you specialized in one of following disciplines?*

() Sharia and Law

() Information Technology

() Medical and health specialties

() Other specialty

Profession specialty:

3) What is the highest level of education you have completed?

- () High school or equivalent
- () Some college, no degree
- () Bachelor's degree
- () Master's degree
- () Medical degree
- () Fellowship / Board
- () Doctorate's degree

4) In any field of law do you work?

() Judiciary

() Attorney

- () Academic sharia law and regulations
- () other: _____

5) In any field of Information Technology do you work?*

- () Information Privacy
- () IT Security
- () IS Management
- () Networking
- () Software Engineering and Programming
- () Web development
- () Databases
- () Computer Engineering
- () Design and Graphics
- () other: _____

6) In any field of medical do you work?

() Medicine - Physician

() Dentistry - Dentist

() Pharmacy

() Nursing and Allied Health professions

- () Health Informatics
- () Health Management
- () Biomedical Engineering

() other: _____

Biographic

7) Gender*

() Male

() Female

- 8) Age*
- () 18-24
- () 25-34
- () 35-44
- () 45-54
- () 55-64
- ()65+

9) What is your marital status?*

() Single

() Married

() Divorced

() Widowed

10) What is your employment status?

() Full-time Employee

() Part-time Employee

() Student

() Retired

() Unemployed

() Self-Employed

11) How many years of work experience do you have?*

() 0 -1

() 2 - 5

()6-9

() 10+

12) What is your monthly income?*

() Less than 3,000 SR () 3,000-5,000 SR () 5,000-10,000 SR () 10,000-15,000 SR () 15,000-20,000 SR () Over 20,000 SR

13) Which region do you belong to?*

() North Region () South Region () Western Region () Eastern Region () Middle Region

14) How large is your town or city?

() Large city

() Medium city

() Small city

() Village or small Town

() Suburbs

Awareness

15) What is your background in terms of information privacy?*

- () I have experience in information privacy
- () I have strong knowledge about information privacy
- () I have limited knowledge about information privacy
- () I don't have any knowledge about information privacy

16) Did you read the privacy agreement before you registering or signing-up on internet?*

- () I always read the privacy agreement
- () I often read the privacy agreement
- () Sometimes I read the privacy agreement
- () I rarely read privacy agreement
- () I don't read privacy agreement

	Strongly Not Concerned	Not Concerned	Neutral	Concerned	Strongly Concerned
Basic personal information	()	()	()	()	()
Health information and medical history	()	()	()	()	()

17) What is the level of your concern about information privacy in various uses of medical information systems in Saudi Arabia?*

Women's health information	()	()	()	()	()
Children's health information	()	()	()	()	()
The exchange of Health data between different health facilities for medical purposes	()	()	()	()	()
The exchange of Health data between different health facilities for academic research purposes	()	()	()	()	()
The exchange of Health data between different health facilities for	()	()	()	()	()

government al purposes					
The exchange of Health data between different health facilities for advertising and trade purposes	()	()	()	()	()

Select your level of your awareness by choosing from zero to five, where five is the highest number, which means you know it in advance and are completely aware of its meaning. Zero means that you have not heard about it before.

18) There are a number of regulations that protect information privacy in Saudi Arabia .. What is your awareness level of the following regulations:

	0	1	2	3	4	5
Article No. (40) from chapter five of The Basic Law Of Government "Saudi Constitution" states that: The privacy of telegraphic and postal communications, and telephone and other means of communication shall be inviolate. There shall be				()		

no confiscation, delay, surveillance or eavesdropping, except in cases provided by the Law.			

Select your level of your awareness by choosing from zero to five, where five is the highest number, which means you know it in advance and are completely aware of its meaning. Zero means that you have not heard about it before. What is your awareness level of the following regulations?

19) Article No (3) of anti-cyber crime law in Saudi Arabia states that "any person who commits one of the following cyber crimes shall be subject to imprisonment for a period not exceeding one year and a fine not exceeding five hundred thousand rivals or to either punishment":

	0	1	2	3	4	5
Eavesdropping or interception or capture any content through the electronic network systems - without legitimate authorization.	()	()	()	()	()	()
Unlawful access to a web site, or hacking a web site with the intention to change its design, destroy or modify it, or occupy its URL.	()	()	()	()	()	()
Defamation and infliction of damage upon others through the use of various information technology devices	()	()	()	()	()	()

Select your level of your awareness by choosing from zero to five, where five is the highest number, which means you know it in advance and are completely aware of its meaning. Zero means that you have not heard about it before. What is your awareness level of the following regulations:

20) Article No (5) of anti-cyber crime law in Saudi Arabia states that any person who commits one of the following cyber crimes shall be subject to imprisonment for a period not exceeding four years and a fine not exceeding three million riyals or to either punishment

	0	1	2	3	4	5
Unlawful access to computers with the intention to delete, erase, destroy, leak, damage, alter or redistribute private data	()	()	()	()	()	()

Stop or disable the network	()	()	()	()	()	()
Obstruction of access to, distortion, and causing the breakdown of services by any means .	()	()	()	()	()	()

Confidentiality

Confidentiality requirements in medical facilities

21) What is the importance of restricting all workers in medical facilitates in Saudi Arabia by the following requirements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Preventing employees to discussing or revealing patient Health	()	()	()	()	()

Information to friends or family members.					
Preventing employees to discussing or revealing patient Health Information to other employees without a legitimate need to know.	()	()	()	()	()
Prevent the disclosure of a patient presence in the hospital or other medical facility, which may reveal to disclose the nature of the disease, without a consent from the patients to unauthorized party			()	()	()

without a legitimate need to know.					
Identify confidential health information by issuing a procedural handbook clearly indicates what's confidential health information and who has authorization to access.	()	()	()	()	()

Confidentiality requirements in medical research.

22) What is the importance of restricting researchers by the following requirements before use or disclosure health information in Saudi Arabia?*

	Strongly Not Agree	Not Agree	No comment	Agree	Strongly Agree
Provide a full description of health information to be used or disclosed.	()	()	()	()	()
Identify the name or other specific identification of person and the role of each persons authorized to access, use or disclose health information.	()	()	()	()	()
Describe each purpose of the requested use or disclosure health	()	()	()	()	()

information. Researchers should note that this element must be specific research study, not for future unspecified research.				
The authorization must has expiration date or event that relates to specific research purpose of the use or disclosure of health information.	()	()	()	()

Accountability

23) What is the importance of having specific accountability standards in health organizations in Saudi Arabia for the purpose of protecting the privacy of health information?*

	Strongly Not Agree	Not Agree	No comment	Agree	Strongly Agree
Health organizations require all employees to sign a statement of adherence to privacy policy and procedures as part of the employee handbook or confidentiality statement as a prerequisite to employment	()	()	()	()	()
The statement of adherence to privacy policies and procedures in health organizations states that the employee acknowledges	()	()	()	()	()

that violations of privacy policies and procedures may lead to disciplinary action, that including termination.					
Health organizations must provide examples of potential violations of privacy policies and procedures.	()	()	()	()	()

Regulations and Policies

Governmental standards and regulations, such as HIPAA in United States, impose huge fines every year on health facilities that violate health information privacy. Even today, many countries, including Saudi Arabia, have no independent governmental standards and regulations to protect the privacy of health information.

24) Select the important	ce level of the following:
--------------------------	----------------------------

	Strongly Not Agree	Not Agree	No comment	Agree	Strongly Agree
I support the existence of a new independent standards and regulations that protect health information privacy, imposes heavy fines on violated health facilities, with addition penalties up to imprisonment for perpetrators who violate the regulations.		()		()	
I support the existence of a new independent standards and regulations	()	()	()	()	()
that protect health information privacy, imposes only heavy fines on violated health facilities.					
---	----	----	----	----	----
I support the existence of a new independent standards and regulations that protect health information privacy, imposes only small fines on violated health facilities.	()	()	()	()	()
I do not support the existence of a new independent privacy standards and regulations because the current general regulations	()	()	()	()	()

are able to			
protect health			
information			
and deal with			
the violations			
of health			
information			
privacy.			

25) What is the importance of adding more regulations to protect the privacy of women's health information in Saudi Arabia?

	Strongly Not Agree	Not Agree	No comment	Agree	Strongly Agree
I believe a unified health privacy regulations are sufficient to protect health information for both male and female.	()	()	()	()	()
I believe it's important to toughening the penalties in	()	()	()	()	()

case of privacy violations in women's health information.				
I believe it's important to add more regulations to protect the privacy of women's health information.	()	()	()	()

26) Based on your knowledge and experience, select the level of satisfaction about the role of the following government entities of protecting privacy of health information in Saudi Arabia.

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Ministry of Health	()	()	()	()	()
Ministry of Justice and the Islamic courts	()	()	()	()	()
Communicatio n and Information	()	()	()	()	()

Technology Commission					
General Bureau of Investigation	()	()	()	()	()

Cultural Background

27) How often do you read books?*

- () Reading is one of my hobbies, and I read books every day
- () Reading is not one of my hobbies, but I read intermittently
- () I rarely read books
- () I don't like reading books

28) How often do you read the holy Qur'an?*

() Every day

() 4-5 times in a week \Box

() Once in a week \square

() 2-3 times in month

() Intermittently during a year \Box

() I can't remember

29) How many chapters of the holy Qur'an did you memorize?*

() Less than one chapter

() 1-3 Chapters

() 3-10 Chapters

() more than 10 Chapters

() The whole Qur'an

30) Do you belong to a religious family?*[] My parents are both religious

[] My father is religious

[] My mother is religious

[] One or more of my siblings are religious

[] I'm a religious

[] Me and My family are not religious

Comments

31) Comments:

Thank You!

Appendix B: The sponsor's letter to deputy minister of health (The sponsor's

Jassim niversitu حامعة القم الرقم: ١٤٣٥ (١٩) التاريخ: ١٠ / ٢ / ١٤٣٥ ه كلية الصحة العامة والمعلوماتيه الصحية مكتب العميد المرفقات: الموضوع : سعادة / الدكتور وكيل وزارة الصحة للتخطيط وإقتصاديات الصحة حفظه الله السلام عليكم ورحمة الله وبركاته ،، تثمن جامعة القصيم / ممثلة بكلية الصحة العامة المعلوماتية الصحية تعاون وزارة الصحة كقطاع مشارك مع المؤسسات التعليمية ذات العلاقة وحيث أن المحاضر / سليمان بن سلمي المطيري والمبتعث حالياً دراسة الدكتوراه في تخصص المعلوماتية الصحية ويقوم حالياً برحلة علمية إلى المملكة العربية السعودية بهدف جمع البيانات اللازمة عن موضوع الرسالة وهو (خصوصية نظم المعلوماتية الصحية بالمملكة). عليه نأمل تلطف سعاتكم بالإطلاع .. والتوجيه لمن يلزم تسهيل مهمة الباحث میکی شاکرین لسعادتکم جهودکم ومقدرین تعاونکم... تقبلوا أطيب التحية ،، عميد كلية المحة العامة والمعلوماتية الص القصيم - البكيرية - سنترال: ٣٣٥٠٤١٤ - فاكس: ٣٣٥٠٤١٠

consent)