

# **Culture of Patient Safety in Public Hospitals in the Asir Region of Saudi Arabia as Perceived by Healthcare Providers and Managers: A Mixed Method Study**

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This thesis is presented for the degree of

**Doctor of Philosophy**

of The University of Western Australia

School of Population and Global Health

Faculty of Health and Medical Sciences

2018



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The work described in this thesis was funded by King Khalid University through the Saudi Arabian Cultural Mission.

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## ABSTRACT

**Background:** Many hospitalised patients around the world are vulnerable to preventable harm, yet healthcare systems that tolerate an inadequate patient safety culture still perpetuate. The World Health Organisation, using European Data from European countries on adverse events, argues that 50–70% of harm that occurs in hospitals can be prevented by improving the culture of patient safety.<sup>1</sup> The ability to improve patient safety is dependent on the safety culture in healthcare organisations.<sup>2</sup> Thus, it is important to explore and identify factors that could affect the culture of patient safety and bring about changes to prevent adverse events from occurring repeatedly.

**Aims:** This thesis aimed to assess and improve the culture of patient safety in public hospitals by identifying the impact of hospital and participant characteristics on the culture of patient safety across 15 public hospitals in the Asir Region, Saudi Arabia.

**Methodology:** An sequential explanatory mixed methods design was selected to achieve sufficient breadth and depth in understanding of patient safety culture in the Saudi context. The data was collected in two phases. Phase I involved the quantitative part of the study and used a cross-sectional survey design. Data were collected using the self-reporting Hospital Survey on Patient Safety Questionnaire (HSOPSC) and analysed using SPSS v.20 software. Statistical procedures and tests in Phase I included descriptive statistics, one-sample t-tests, ANOVA, univariate analysis and multiple regression.

Phase II involved data collection from 30 healthcare providers and managers to further explore the findings from Phase I and better understand the perceptions of safety culture. QRS-NVivo 8 was used to store and analyse the qualitative data. Thematic analysis was used in this phase.

**Sampling:** In Phase I, a stratified random sampling technique was used to collect data from 15 public hospitals. With a response rate of 70%, 1100 participants were involved in this study (including doctors, nurses, pharmacists, other allied healthcare technicians, and managers).

In Phase II, semi-structured interviews using a purposive sampling method were used to collect data from 30 healthcare providers and managers.

**Main Outcomes:** All areas of patient safety culture were considered areas for improvement except for *Teamwork within Unit* and *Organisational Learning–Continuous Improvement*. The

lowest positive responses were in *Staffing, Handoffs & Transitions, Teamwork across Units, Communication Openness, Management Support for Patient Safety, Supervisor/Manager Expectations & Actions Promoting Patient Safety, Overall Perception of Patient Safety, Feedback & Communication about Error, Non-punitive Response to Error, and Frequency of Events Reported.*

Approximately 35% of participants had not reported any adverse events in the past 12 months, and 50.5% of the participants rated their working areas as “excellent” or “very good” with regard to patient safety. However, 8.5% of respondents saw their workplace as either “poor” or “failing”.

Bivariate and multivariate analysis revealed that the work context variables and respondents’ demographic data (hospital accreditation status, working hours, staffing levels, direct contact with patients, language, and experience) were major influencing factors in the culture of patient safety. In general, accredited hospitals scored better than non-accredited hospitals on the patient safety culture scale.

The qualitative findings confirmed the quantitative results in terms of factors affecting the participants’ perception of patient safety culture. *Non-punitive Response to Error, Communication Openness* and *Staffing* were of great importance when reporting errors.

**Conclusion:** The findings from the two phases of the study illustrated that the current state of patient safety culture in the 15 public hospitals in Asir is weak and needs urgent intervention and improvement.

The factors affecting the culture of patient safety were related to the concept of the multicultural workplace. There was a significant correlation between the multicultural workplace and the dimensions of patient safety culture and links between hospital accreditation, cultural background, language, and safety culture. Cultural integration, for non-Saudi healthcare providers and managers is highly recommended to bridge gaps between local and multinational workforces.

If implemented, the recommendations presented in this study to enhance teamwork across units, communication openness, and error reporting systems, and promote non-punitive responses to errors would provide a better and safer work environment for both healthcare providers and patients.

**Significance of the research:** Many studies of patient safety in Saudi Arabia are limited to examining the perceptions of nurses and/or doctors towards patient safety. This study identified the factors that influence patient safety culture from different perspective including nurses, doctors, managers and other allied healthcare providers. The study also contributes to the existing body of research knowledge by offering findings from countries and healthcare systems that have not been adequately assessed previously and different from Western healthcare systems.

Finally, the study examined the critical role of top-level managers and their power on imposing cultural change towards patient safety culture. The study revealed, for the first time in a Saudi context, that the multicultural workforce environment affects patient safety culture. These findings could be used to develop and implement plans to improve safety culture as well as improve current survey instruments or develop new research surveys.

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## ACKNOWLEDGEMENTS

First, I thank Allah (God) for all His blessing on me and His help throughout this journey. At times, I felt that it might be impossible to complete this PhD project.

I would like to take this opportunity to thank and extend my deepest and sincerest gratitude to my supervisors, Professor David Stanley, Professor David Preen and Dr Gavin Pereira, for all their motivation, guidance, assistance, advice, contributions and encouragement. Thank you all for your endless support, both academically and socially, during my PhD journey. Thank you for your patience, constructive comments and attention. Without your valuable support, this research would not have been completed.

My genuine appreciation and thanks also goes to my parents for their support, help and cooperation for looking after my children during my absences.

I also extend my heartfelt and warm thanks to my most beloved children, Osamah, Anas, Faris, and Ibrahim for their patience and understanding. I know how difficult you found staying on your own at this age without your mum and dad, but you were in my prayers all the time.

I acknowledge Ms Jennifer Di Risio for her kindness in organising my supervisor meetings. Also, I would like to thank Dr Joanne Edmondston and the GRS staff for their continuous help and support. I extend my gratitude and thanks to the Saudi Government and King Khalid University for their provision of my Scholarship. I also owe special thanks to all my study participants for their cooperation and commitment.

My thanks also to Dr. Christine Davies of Tweak Editing for her invaluable assistance in formatting and proofreading the final version of the thesis.

Special thanks go to Mr Saeed Mahdi for his personal and managerial support to complete this project. Finally, to Mr Ali Hussain and Mr Khalid Suliman, from King Khalid University, I say thank you for your cooperation and help.

Special gratitude goes to all participants in this study for their time, patience, and participation. Without your participation, this thesis would not have been completed. Many people have contributed to the completion of my study, to all of them I say thank you.

## **DEDICATION**

I dedicate this PhD project to all healthcare providers and managers who make patient safety a priority in their daily job.



## LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
AE	Adverse Event
AHRQ	Agency for Healthcare and Research and Quality
CBAHI	Saudi Central Board for Accreditation of Healthcare Institutions
CIA	Central Intelligence Agency
HSOPSC	Hospital Survey on Patient Safety Culture
IAEA	International Atomic Energy Agency
KSA	Kingdom of Saudi Arabia
MOEP	Ministry of Economic and Planning
MOH	Ministry of Health
MOF	Ministry of Finance
MSI	Modified Stanford Patient Safety Culture Survey Instrument
NHS	National Health System
NQF	National Quality Forum
RN	Registered Nurse
PHC	Primary Healthcare Centre
SAQ	Safety Attitude Questionnaire
SHCS	Saudi Healthcare System
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
UN	United Nation
USA	United States of America
WHO	World Health Organisation

## CHAPTER 1. INTRODUCTION

### 1.1 INTRODUCTION

This thesis explores and assesses the factors affecting patient safety culture from the perspective of healthcare providers and managers at public hospitals in the Saudi healthcare system. Healthcare organisations in many countries, including Saudi Arabia, are faced with numerous challenges including patient safety. Previous research into safety culture has stressed the importance of the continuous evaluation of safety culture to improve patient safety.

A significant portion of patient safety research has come from healthcare organisations in developed countries. This study was conducted within the healthcare system of Saudi Arabia and contributes to the scholarly literature by providing valuable information on patient safety culture in a healthcare system and culture that differs from Western societies.

This chapter starts with a brief background and context to the research topic and presents the purpose and objectives of the research. This chapter also states the significance of the study and describes the other chapters of the thesis.

### 1.2 BACKGROUND

Providing high-quality healthcare is the primary purpose of all healthcare organisations. However, healthcare systems around the world are faced with many challenges in the provision of quality healthcare services. One of these challenges lies in the lack of patient safety culture. The culture of safety in any organisation represents the shared assumption and values of people towards errors.<sup>3</sup> A lack of patient safety culture can cause adverse events (AEs). In healthcare settings, AEs are described as *“an unintended injury or complication that results in disability at the time of discharge, death or prolonged hospital stay and that is caused by healthcare management rather than by the patient’s underlying disease process”*<sup>4(p1679)</sup>.

AEs are not limited to a particular discipline or area in the healthcare system and can occur due to an error of commission or error of omission. Errors of commission refer to active errors such as administering the wrong drug. Errors of omission mean failure to perform a task or responsibility, such as not giving treatment.<sup>4</sup> Most AEs in healthcare settings occur from errors

of omission rather than of commission. Understanding how errors occur can help healthcare providers and managers to minimise them and subsequently prevent or reduce harm.<sup>5</sup>

The interest in exploring patient safety culture has increased since the release of “To Err is Human: Building a Safer Health System” by the Institute of Medicine (IOM) in 1999.<sup>6</sup> This report claims that the number of deaths related to clinical errors in hospitals in the United States of America (USA) is as high as 98,000 each year,<sup>3</sup> more than those from car accidents, breast cancer or AIDS.<sup>6</sup>

A report released in the same year in the United Kingdom (UK) found that around 850,000 patients a year are harmed after admission to UK hospitals.<sup>7</sup> In Australia, hospital deaths resulting from AEs are thought to represent 16.6% of all hospital admissions. The study also found that nearly 11% of children (under 15 years) had an AE after hospital admission.<sup>8</sup>

A study conducted to determine the extent of harm associated with medical AEs used global burden of disease (GBD) measurements to estimate the number of AEs that occur worldwide each year. Of 421 million hospitalisations per year, 43 million AEs had a critical effect on the lives of patients.<sup>9</sup>

A systematic review of published research from 1976 onwards estimated that 42.7 million AEs occur each year in hospitals around the world,<sup>9</sup> with 16.8 million unsafe practices in high-income countries and 25.9 million in low- and middle-income countries.<sup>9</sup>

Despite the high number of errors in hospitals on a global scale, 50–70% of patient-related harm can be prevented by improving the culture of patient safety.<sup>1</sup> The glossary at the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Network website describes patient safety as, “freedom from accidental injuries that result from medical care”.<sup>10</sup>

The incidence of AEs in healthcare systems is not limited to developed countries. Evidence from the literature shows that thousands of in-hospital patients in developing countries face similar experiences. For instance, in a retrospective study to explore the extent of AEs in eight developing countries (Egypt, Jordan, Kenya, Morocco, Tunisia, Sudan, South Africa and Yemen), researchers examined 15,548 patient records.<sup>11</sup> The study showed that 8.2% of hospitalised patients experienced at least one adverse event (range 2.5–18.4% per country).<sup>11</sup>

In KSA, the healthcare system has evolved and expanded rapidly in the past two decades. For example, the number of hospitals increased from 74 to 415 between 1970 and 2009 and the

number of beds increased from 9,039 to 58,126.<sup>12</sup> While patient safety is a top priority for MOH, the rate of claims against medical errors continues to escalate by approximately 11% per annum. The Saudi Forensic Medicine Department reported that, on average, 11 people die each month due to medical errors in Saudi hospitals.<sup>13</sup> The only accreditation board in KSA is the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI). This board estimates a higher number of medical errors, many of which are not reported due to fear of administrative penalties and sanctions.<sup>14</sup>

Local newspapers and mass media play a significant role in the exposure of medical errors in KSA. In 2012, the Arabic-CNN reported that a 12-year-old girl received a blood transfusion infected with HIV in a public hospital in Jizan.<sup>15</sup> In 2016, Sabiq, a widely read online newspaper, reported that a 30-year old woman in Dammam City had her leg amputated after an incorrect diagnosis.<sup>16</sup>

In KSA hospitals, patient safety is one of the quality indicators used to evaluate the quality of healthcare services. It is crucial to implement a culture that facilitates and supports the quality of healthcare and improved patient safety. The assessment of safety culture will help healthcare organisations to detect cultural weaknesses and improve them to promote a higher level of safety and care. Evidence-based literature describing the significant impact of patient safety culture in healthcare settings is becoming increasingly difficult to ignore. In 2008, the World Health Organisation (WHO) declared patient safety to be a global problem with a significant global burden.<sup>17</sup>

### **1.3 PURPOSE AND OBJECTIVES**

The purpose of this study was to evaluate the current culture of patient safety by examining the factors affecting the safety culture in 15 public hospitals in the Asir Region, KSA. The following objectives were developed to meet this aim:

1. Examine how healthcare providers and managers perceive patient safety culture.
2. Investigate the awareness of healthcare providers and managers on AE reporting methods in their hospitals.
3. Determine the differences in the dimensions of patient safety culture between accredited and non-accredited hospitals.

4. Explore the relationship between participant and hospital characteristics (gender, age, education, language, nationality, working hours, direct contact with patient, professional tenure, organisational tenure, hospital size, and hospital accreditation) and the four dimensions of patient safety culture.
5. Estimate the capacity of participants and hospital variables to predict the positive perception of patient safety culture dimensions.
6. Present recommendations for healthcare managers and leaders on strategies to improve patient safety culture among healthcare providers in public hospitals.

#### **1.4 STUDY SIGNIFICANCE**

This project explored the culture of patient safety in public hospitals among healthcare clinicians and managers in Saudi Arabia. The healthcare system in Saudi Arabia has adopted some Western patient safety strategies and programs to improve safety. However, these programs were designed for a different culture and may not necessarily improve patient safety in the Saudi Arabia context. Validated measures will help to transform the organisational culture to improve clinical practice, support benchmarking and sharing of best practices, and facilitate priority areas for future research. Ongoing evaluation and improvement of patient safety culture will likely improve the overall safety and patient outcomes.

This research also will contribute to the scholarly literature by providing valuable information on patient safety culture from a different healthcare system and culture to that of Western societies. At an administrative level, it will add to the knowledge on planning, development and implementation of new culture-change strategies, enable decision makers to target areas for improvement within the healthcare system, and eventually contribute to better patient care with low risk of harm. The findings of this study are likely to have relevance not only for Saudi public hospitals but hospitals in other Middle Eastern countries, where culture, conditions and issues of quality of care may be similar.

In addition, to the researcher's knowledge, this is the first study that includes a group of small and remote hospitals in the Saudi healthcare system.

## 1.5 THESIS STRUCTURE

This thesis consists of eight chapters:

Chapter 1 introduces the study, describing the extent of the problem at a global and local scale. The aim, objectives and significance of the study are described.

Chapter 2 presents the historical background of Saudi Arabia including, culture, politics and details on the healthcare system. It also presents general information and concepts about unwanted medical AEs and how accidents occur in the healthcare system.

Chapter 3 is the literature review, which is divided into two parts. The first part provides a comprehensive literature review related to patient safety culture. The second part presents a systematic literature review of the factors affecting patient safety culture and highlights gaps in the literature.

Chapter 4 explains the methodology adopted in this study, specifically the sequential mixed methods design. It starts with a general background to mixed methods research and the rationale for using a mixed method design. The chapter also identifies the study sites, target population and ethical considerations. Part 1 of this chapter describes the process used in the quantitative phase (Phase I) of the study. It outlines the research method, describes the study sample, and explains the data collection and analysis. Part 2 presents the process of the qualitative phase (Phase II) of the study. It describes the methods, participant recruitment, data collection process, data analysis and emergent themes.

Chapter 5 presents the major findings of Phase I of the study. The quantitative results are displayed in this chapter.

Chapter 6 shows the result of Phase II of the study. The qualitative results are highlighted in this chapter.

Chapter 7 discusses and integrates the research findings in relation to the study objectives.

Chapter 8 examines the limitations and contributions of the study. It also provides recommendations for policymakers and the implication for future research.

## **1.6 SUMMARY**

This chapter offered a brief overview of the extent of the problem related to patient safety culture within the healthcare system in different countries and presented the study aim, objectives and significance.

The next chapter includes a brief description of the context of the study. It describes the Kingdom of Saudi Arabia, its location, culture, demographics, economics and the healthcare system.

## CHAPTER 2: SAUDI ARABIA AND HEALTHCARE SYSTEM PROFILES

### 2.1 INTRODUCTION

This chapter is divided into two sections. The first section provides relevant information to the Kingdom of Saudi Arabia (KSA) as the location and context of the study. This information includes a brief description of the demographic features, economy and culture of KSA.

The second section presents an overview of the Saudi healthcare system, the historical perspective, current context, healthcare system structure, levels of care and healthcare accessibility.

### 2.2 SAUDI ARABIA PROFILE

#### 2.2.1 LOCATION AND UNIFICATION

The Kingdom of Saudi Arabia, more commonly known as Saudi Arabia, is situated in Southwest Asia between Africa, Asia and close to Europe. It is the largest Arab country in the Middle East and occupies around 80% of the Arabian Peninsula<sup>18</sup> with a landmass of approximately 2.25 million square kilometres (see Figure 2.1). KSA shares its borders with the Arabian Gulf, United Arab Emirates, Qatar and Bahrain to the east, the Red Sea to the west, Kuwait, Iraq and Jordan to the north, and Oman and Yemen to the south. KSA is divided, geographically, into five provinces that are subdivided into 13 regions each with a capital city as a regional major administrative centre.<sup>19</sup>

King Abdulaziz Al-Saud unified KSA in 1932, and it remains a Monarchy today. In 1992, the late King Fahad introduced a national Consultative Council as a new ruling method in the nation.<sup>20</sup> KSA has acquired international significance for two reasons: (1) the two most holy places for Muslims around the world (Makkah and Al-Madinah Al-Munwarah) are in Saudi Arabia<sup>20</sup> and (2) the commercial quantities of oil reserves have considerable influence in the modern world.<sup>20</sup>





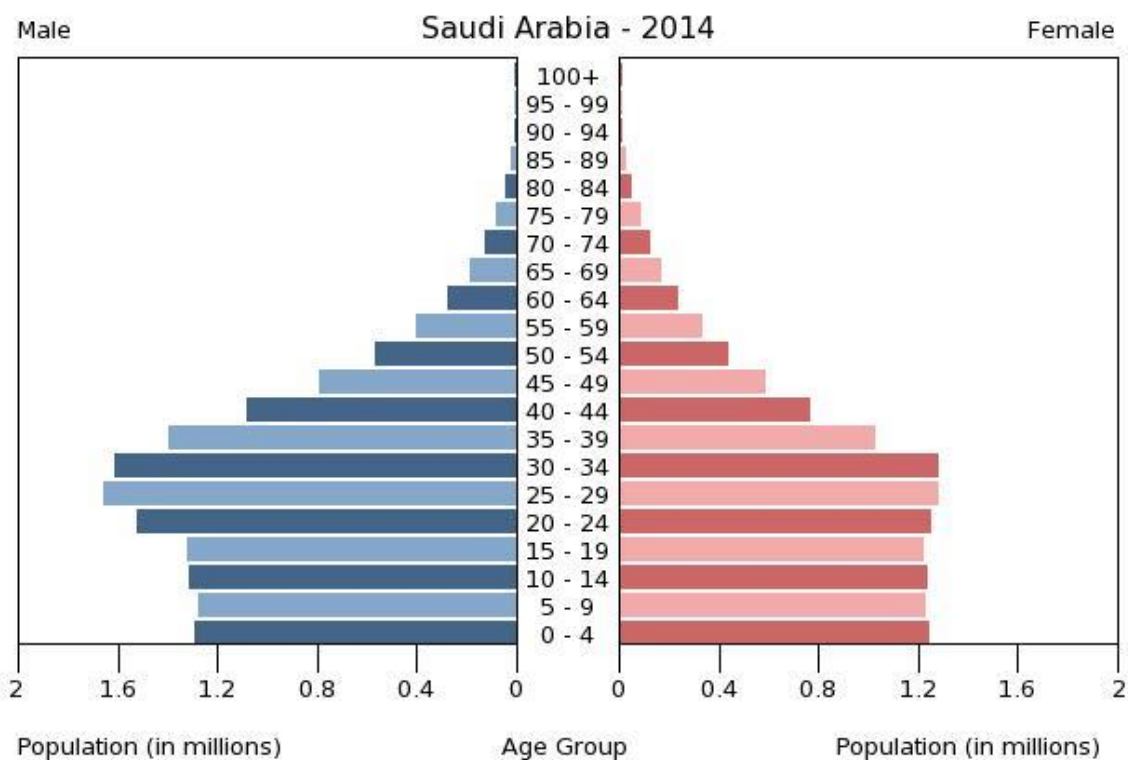
Figure 2.1 Kingdom of Saudi Arabia, adapted from World Atlas<sup>21</sup>

### 2.2.2 POPULATION

The official language in KSA is Arabic, but English is widely spoken as many non-Arabic expatriates work in different professions and industries. The total population according to the 2016 census is 31,752,308 compared to approximately 9.8 million in 1980.<sup>19</sup> The United Nation (UN) expects that the KSA population will continue to increase, reaching around 39.8 million by 2025.<sup>22</sup>

The population growth rate in KSA has shown an unstable trend over the last decades, being 5.98% from 1980–1985, 1.63% from 1995–2000, 4% from 2000–2005, and 2.7% from 2005–2010.<sup>19</sup> Approximately 70% of the Saudi population is under the age of 35. The population pyramid in Figure 2.2 shows the population structure based on age and sex in KSA.<sup>19</sup>

In Figure 2.2, the population is distributed along the horizontal axis, with males on the left and females on the right. The expected population growth will increase the demand for essential services and facilities, including healthcare services. In KSA, there are more than eight million immigrants from all over the world.<sup>19</sup>



**Figure 2.2** Saudi Arabia Population, Source: CIA, The World Factbook<sup>23</sup>

### 2.2.3 ECONOMY

The KSA economy developed dramatically after the discovery of oil in 1938. Since then, KSA has been the world's largest oil producer and exporter, accounting for more than 85% of the country's exports.<sup>20</sup> However, KSA has diversified its economy and exports a variety of industrial goods. The huge oil production and export market makes KSA a key player in oil prices in the world market,<sup>20</sup> which has the largest economy in the Arab world. The estimated annual value of total oil exports is 1,525,587 million Saudi Arabian Riyal. The World Bank classified KSA as a high-income country based on the living standard indicator and the per capita GDP around SAR 91,328 (US\$ 24,354).<sup>24</sup> The high global oil demand has enabled the KSA to adopt different development plans in both public and private organisations, which increased employment and the socio-economic status of its citizens.<sup>20</sup> The sustainable economy enables KSA to offer all its citizens free access to all levels of healthcare in the country.<sup>20</sup>

#### 2.2.4 CULTURE

Culture in its simplest definition means the values and behaviours that are shared by a group of people in a given place.<sup>25</sup> According to this definition, culture can be shaped and affected by many factors including race, economy, religion and geographic location. In KSA, the culture is affected by all these factors. For example, the desert, nomadic life and religion has greatly influenced the Saudi culture. The Saudi society is conservative and revolves around home and family. In the Islamic context, Muslims are significantly encouraged to keep contact with their family members (i.e., grandparents, uncles, aunts). It is expected that family members visit regularly and offer support when needed. Family members are also expected to be compassionate and show appropriate respect and cheerfulness.<sup>20</sup>

The Saudi culture has been affected by rapid changes and transformation in the last few years. The cultural change has introduced new values, behaviours, lifestyles and health problems. Most notably are the significant increase in junk food consumption and decrease in the level of physical activity.<sup>20</sup>

### 2.3 HEALTHCARE SERVICE IN SAUDI ARABIA

#### 2.3.1 HISTORY AND DEVELOPMENT

The official healthcare system in KSA was established in 1925 as the first form of organised health service, which aimed to provide free and comprehensive healthcare services for the population and pilgrims visiting the two holy cities (Makkah and Al-Madinah).<sup>26</sup> At that time, KSA income was relatively low and the delivered healthcare was insufficient and did not meet the high demand. This resulted in most people continuing to depend upon traditional medicine for many years.<sup>27</sup> In fact, the national income was a great challenge to achieve major advances in healthcare. The incidence of epidemic diseases remained relatively high among the population and pilgrims.<sup>27</sup>

However, the economic boom after the discovery of oil led to the establishment of MOH in 1950.<sup>20</sup> Twenty years later, Five-Year Development Plans were introduced by the Saudi Government,<sup>20</sup> which aimed to improve all sectors of the nation, with a special focus on healthcare services. The health services in KSA continued to increase and have improved significantly.<sup>28</sup> It is important to note that the Saudi MOH adopted English as the formal language in all healthcare facilities because the newly adopted health system was built on the

principles of the Western medicine and dependent on expatriate healthcare workers who did not speak Arabic.<sup>20</sup>

### 2.3.2 CURRENT HEALTHCARE SYSTEM

Healthcare services in KSA have improved significantly in terms of quality, quantity and access. For instance, between 1970 and 2012, the number of hospitals increased from 74 to 259 and primary healthcare centres (PHC) increased from 1,925 to 2,259.<sup>29</sup> In addition, the total number of hospital beds expanded from 9,039 to 35,828 for the same period.<sup>29</sup> Huge financial support from the government to the health department was notable and obvious. Approximately 18% of the government budget in 2015 (160 billion SAR or US\$ 43 billion) was allocated to develop the healthcare industry in KSA.<sup>29</sup> Today, the number of hospitals in KSA is 453 with a bed capacity of 67,997.<sup>29</sup> Gallagher describes the development of healthcare in KSA as:

*“Although many nations have seen sizable growth in their healthcare systems, probably no other nation [other than Saudi Arabia] of large geographic expanse and population has, in comparable time, achieved so much on a broad national scale, with a relatively high level of care made available to virtually all segments of the population.”<sup>30(p182)</sup>*

In 2000, the WHO ranked the healthcare systems of 190 countries around the world, with the KSA healthcare system ranked 26<sup>th</sup>, coming before many other international healthcare systems such as Canada (30), Australia (32) and New Zealand (41).<sup>31</sup>

The MOH in KSA supervises 20 regional General Directorates of Health Affairs throughout the country. The role of these Health Directorates includes implementing health policies, managing and supporting health services, creating plans and programs, supervising and organising the private health sector and coordinating with other relevant bodies. In KSA, the healthcare system can be classified as a national healthcare system in which the government provides healthcare services in a number of public hospitals and primary healthcare centres. MOH is the main government agency that provides preventive, curative and rehabilitative healthcare services in KSA. These services comprise almost 59% of the total health services in Saudi Arabia. Other government bodies providing healthcare services in KSA include referral hospitals (e.g. King Faisal Specialist Hospital and Research Centre [KFSH & RC]) and Army

Forces Medical Services, which provide around 20% of healthcare services.<sup>20</sup> The private sector also provides around 21% of the total healthcare services, particularly in big cities. The 2012 MOH statistical records identify 127 private hospitals with a capacity of 12,817 beds. However, there is multiplicity in providing healthcare services in KSA and communication or coordination among these parties are not clear.<sup>20</sup>

Figure 2.3 illustrates the organisational structure and relationship of departments within the Saudi Healthcare System.

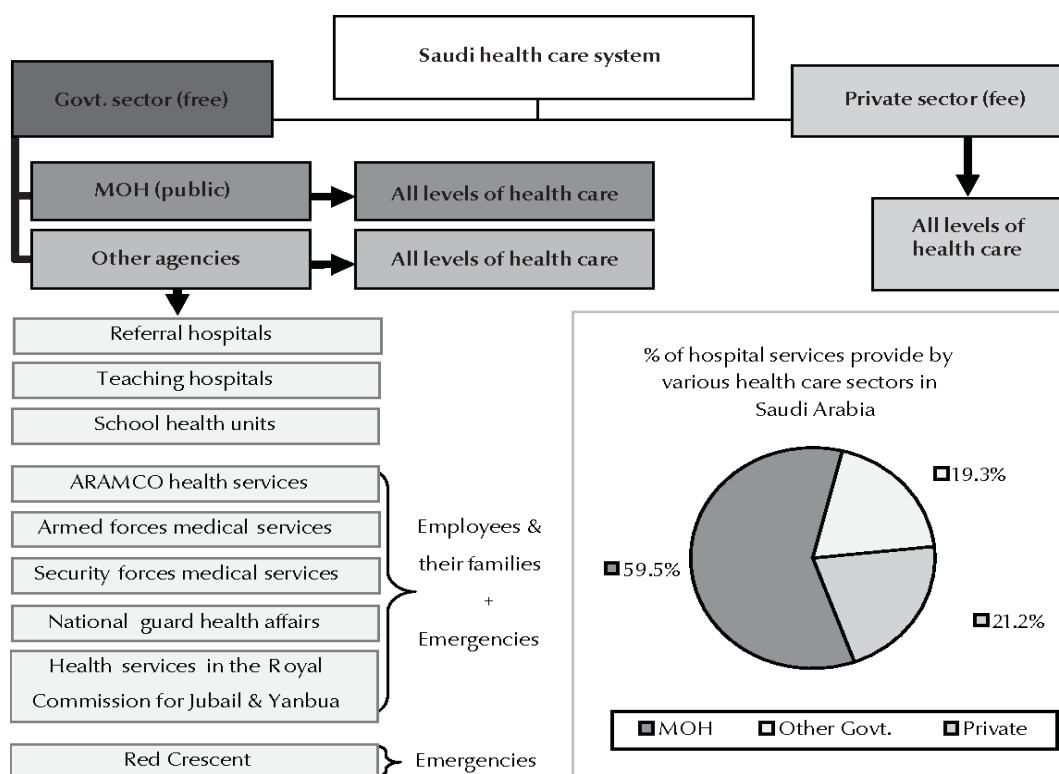
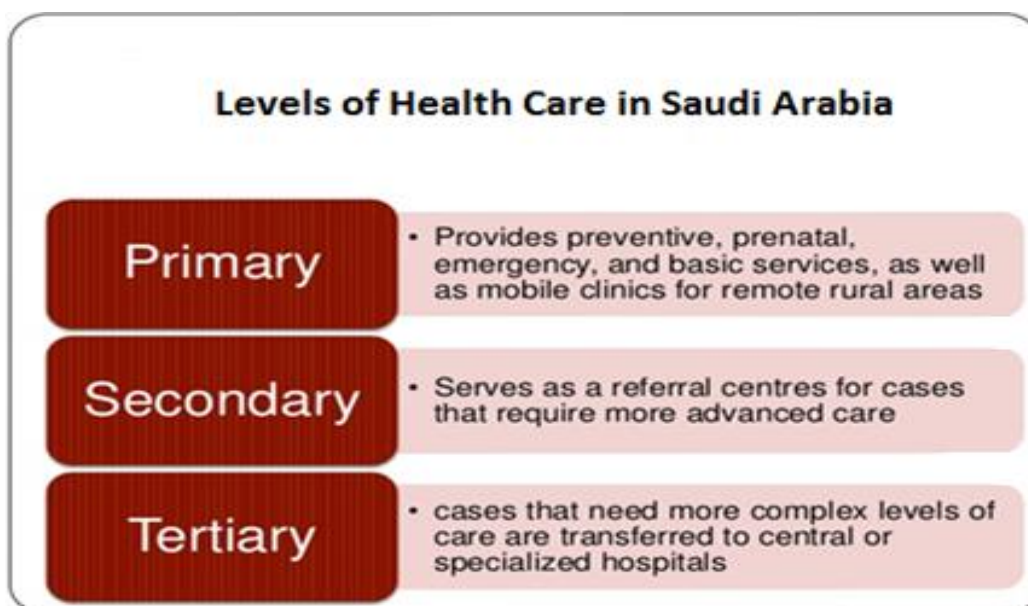


Figure 2.3 Structure of the Healthcare System in Saudi Arabia<sup>26(p93)</sup>

The need for healthcare services in KSA exceeds the available services.<sup>32</sup> Some of these needs are unique to KSA, and some are common to other countries with a strong economy. For instance, the country is experiencing rapid growth in population, and high numbers of visitors from around the world each year to Makkah and Madinah.<sup>20</sup> This increases the demand on healthcare services. Another challenge that faces the current healthcare system is the absence of clear communication and coordination between the many healthcare service providers.<sup>33</sup>

### 2.3.3 HEALTHCARE LEVELS

The available healthcare services in KSA are categorised into three levels: primary, secondary and tertiary (Figure 2.4).<sup>34</sup> Primary care services aim to provide basic or primary preventive and curative services. These services are supplied to the Saudi population through primary healthcare centres. Chronic diseases, vaccination and prenatal care are provided and treated at this level. However, cases requiring higher levels of care such operations or surgeries are referred to public hospitals or the secondary level of care. The tertiary level of care provides more complex and specialised healthcare services such as cancer cases or open-heart surgery. The relationship between these levels is organised bottom-to-top, with a top-to-bottom relationship not being demonstrated. For example, there are no communication channels between tertiary and primary levels of care. In fact, there is a gap between the top-to-bottom levels of healthcare services in KSA and more effort is needed to reform it. Figure 2.4 shows the top-to-bottom administration communication channel.



**Figure 2.4:** Levels of Healthcare Services in KSA<sup>26</sup>

### 2.3.4 HEALTHCARE ACCESSIBILITY

The distribution of healthcare services in KSA, in general, is based on equity and the intensity of the population in each region. However, MOH statistics indicated a misdistribution in both

the provided healthcare services and the number of health professionals, particularly in remote areas.<sup>35</sup> The waiting time for specific healthcare services and facilities is another problem in the healthcare system in KSA.<sup>36</sup>

Additionally, there is a lack of services for disadvantaged groups such as the elderly, people with special needs such as disability, and adolescents.<sup>35</sup> In fact, some people cannot access healthcare facilities in some places in KSA. Nonetheless, the distribution strategies of healthcare services in KSA need a holistic reform to improve accessibility to healthcare services in some remote areas.

### 2.3.5 HEALTH WORKFORCE

One of the chronic challenges in the KSA healthcare system is the shortage of local healthcare professionals such as registered nurses (RN) and doctors.<sup>37</sup> It is estimated that three-quarters of RNs and doctors in KSA are expatriates (expatriates being people who work or live in different countries other than their own country) with a high rate of turnover.<sup>37</sup> According to MOH<sup>38</sup> statistics, the total number of healthcare providers in public hospitals and primary healthcare centres is 303,578 (including 211,219 physicians and nurses). Saudi physicians and nurses represent only 32.1% ( $n = 67,847$ ) of this number. The number of physicians per 10,000 of the population is 10 whereas the rate of nurses to 10,000 of the population is 22.3. The Saudi health system, therefore, will continue to rely heavily on international healthcare workers for the next few decades. In addition, the proportion of Saudi healthcare providers in the national healthcare system is expected to decrease in the future due to significant expansion in healthcare facilities around the country.<sup>38</sup> However, the effect of multi-nationals and cultural differences between healthcare providers on patient safety is evident.<sup>39,40</sup>

### 2.3.6 SUMMARY

This chapter presented a brief introduction to the Saudi profile with regard to the country's location, population, economy and culture. The chapter also briefly overviewed the history of the healthcare system in Saudi, its development, level of healthcare services, accessibility and workforce.

The following chapter reviews the literature on patient safety culture and the factors affecting safety culture in KSA.

## CHAPTER 3. LITERATURE REVIEW

### 3.1 INTRODUCTION

This chapter presents a review of the literature relevant to the inquiry of the study. Safety culture is a complex and broad topic. The term “culture” has been used extensively in different topics and context beyond the original anthropological perspective. In the available literature, “culture” can be used to describe a wide range of social aspects including specific behaviour, nations, societies or perception such as safety or organisational culture. Therefore, this chapter is organised into four main parts to assist the reader to develop a broad understanding of the topic. Part I presents the definitions of organisational culture, its types and levels. Part II explains safety culture, safety climate, and the differences between the two. Part III explains the concepts of patient safety, its models and assessment methods, and presents a brief overview of patient safety in KSA and other developing countries. Part IV presents a systematic search of the literature to examine the factors affecting patient safety culture in healthcare organisations and overviews patient safety in KSA.

### 3.2 PART I: WHAT IS ORGANISATIONAL CULTURE?

#### 3.2.1 DEFINITION

The concept of culture within an organisation is nebulous, yet it significantly influences all aspects of any organisation. It is widely accepted that culture is described as the deeply rooted values, assumptions and beliefs that are shared by personnel in any organisation. The current literature offers some definitions and descriptions for organisational culture.

One of the most simple and commonly known definitions is the way we do things around here.<sup>41</sup> Organisational culture is defined as, “*the pattern of beliefs, values and learned ways of coping with experience that have developed during an organisation’s history, and which tend to be manifested in its material arrangements and the behaviours of its members*”.<sup>42(p9)</sup>

Schein offered a definition of organisational culture, that he called, “*an empirically based abstraction*”, being a “*pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well*



*enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”*.<sup>43(p10)</sup>

Hofstede offers a different view and defines organisational culture as, *“the collective programming of the mind which distinguishes the members of one human group from another”*.<sup>44(p21)</sup> Hofstede also developed a model called “culture dimensions” to describe the impact of a society’s culture on the values of its population. Cultural dimensions were developed as a result of adopting a factor analysis to investigate the results of a worldwide survey conducted between 1978 and 1983 by IBM. According to this view, every country has been placed in a position that enables comparison between countries based on the score on each dimension. Of particular interest is the significant correlation that was observed between culture according to the “Hofstede Dimensions” and people’s personality.<sup>45</sup> People are mainly affected by their society, which also affects their job attitude and understanding towards their work.

The Hofstede work shows that culture is a fundamental property of an organisation and it has a powerful influence on human behaviours. It is, therefore, one of the most critical issues for a highly successful organisation.

Wei and Baiyin<sup>46</sup> describe four stages in which cultures evolve and work. The first stage starts with the values, beliefs, aspirations and vision of the organisation. In this stage, the inspiration is used as a driver to translate the managers’ or leaders’ assumptions to values and then to symbols. The second stage is the implementation, where values are embedded into the system, practice and policies. Maturity is the third stage and occurs as a result of negotiations (the drivers). Maturation appears when the organisation becomes stable, and the subculture of the organisation is defined. In this stage, the meanings of values change, based on the outcome of the negotiations and new artefacts. Transformation is the last stage. It arises with the restoration of basic assumptions to the new unified area of growth.

While culture is invisible and operates outside the awareness of people, leaders should understand that, at the organisational level, it is best to avoid possible conflicts that can negatively affect safety practices and perception of organisational rules, norms and values.

### 3.2.2 TYPES

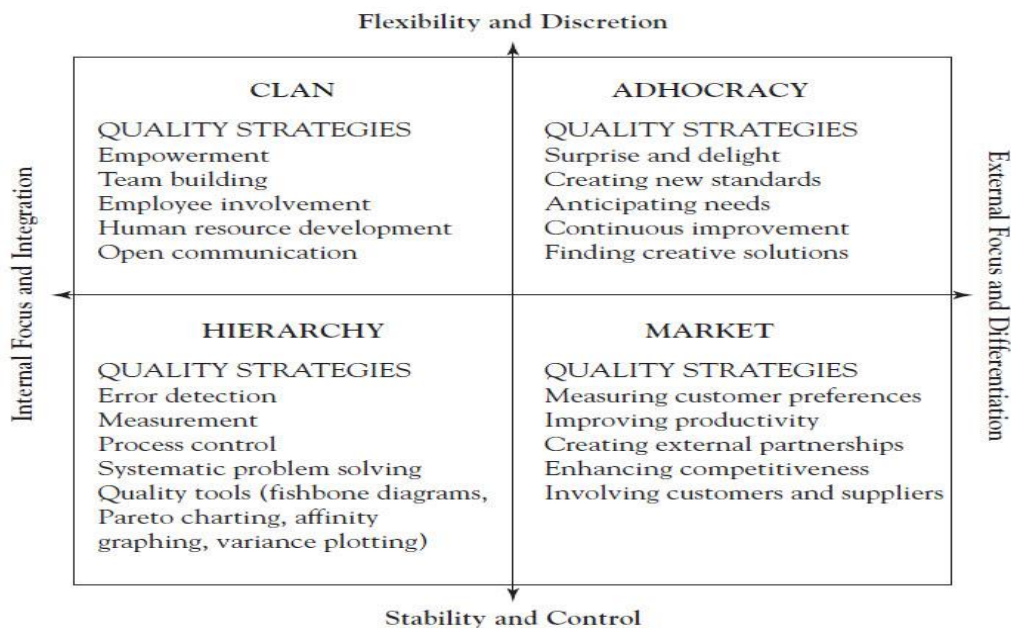
After the development of the “Competing Values Framework” to explore the major indicators of employee effectiveness, Cameron and Quinn<sup>47</sup> identified four major cultural types: Clan Culture, Adhocracy Culture, Market Culture and Hierarchy Culture. The four cultural types were placed on vertical and horizontal lines as shown in Figure 3.1. The four types of culture are based on four criteria: stability and control; flexibility and discretion; internal focus and integration, and external focus and differentiation. Each type is characterised by certain principles.

The Clan Culture is similar to being in an extended family and characterised by its internal focus and flexibility of values.<sup>47</sup> The Clan Culture encourages cooperation between people, supports organised teamwork, the safety of people and open communication. It also emphasises people development and bonds employees by morals. The leader’s role is to facilitate, mentor and build teams.

The Adhocracy Culture, with its external focus and flexibility in values, is described as a dynamic, continuously improving and creative workplace.<sup>47</sup> Employees take risks and leaders are innovators and risk takers. It responds rapidly to changes in the outside environment. Within the organisation, experiments and innovation are the bonding materials.

The Market Culture has a strong external focus and is a results-based organisation. Employees within this culture are aggressively competitive and focused on goals.<sup>47</sup> Its main purpose is to increase productivity, profits, success, reputation and increase customer satisfaction.

The Hierarchy Culture has a strong internal focus and is known for its structured work environment.<sup>47</sup> Employees work under reliable internal procedures and control mechanisms. Leaders are the main coordinators and organisers, and improvement strategies are usually based on error detection.



**Figure 3.1** Competing Values Framework<sup>47(p32)</sup>

### 3.2.3 LEVELS

In 1980, Schein<sup>48</sup> examined organisational culture and developed a model to describe the culture and make it more visible within an organisation. Organisational culture was classified into three levels: (1) artefacts and symbols, (2) espoused beliefs and values, and (3) underlying assumptions (Figure 3.2). These levels related to the degree that culture could be perceived (“very tangible” to “deeply embedded”). Artefacts and symbols refer to the visible elements in the organisation to the employee and to external parties. These elements may include the organisation’s logo, uniform, and structure. However, while this level is easy to notice, it is difficult to decipher. The second cultural level is espoused beliefs and values. These are characterised by standards, values, rules of conduct and championed leaders. Nonetheless, problems can arise when the views and ideas of managers conflict with the basic assumptions of the organisation. The final level of culture relates to the basic underlying assumption. It is deeply embedded in the culture of an organisation and is the source of the values. This level shapes people’s behaviour within the organisations. In practice, the organisational cultural model levels are sometimes represented as an “Onion Model” being based on different layers. Figure 3.2 shows the three levels of culture as described by Schein.<sup>49</sup>

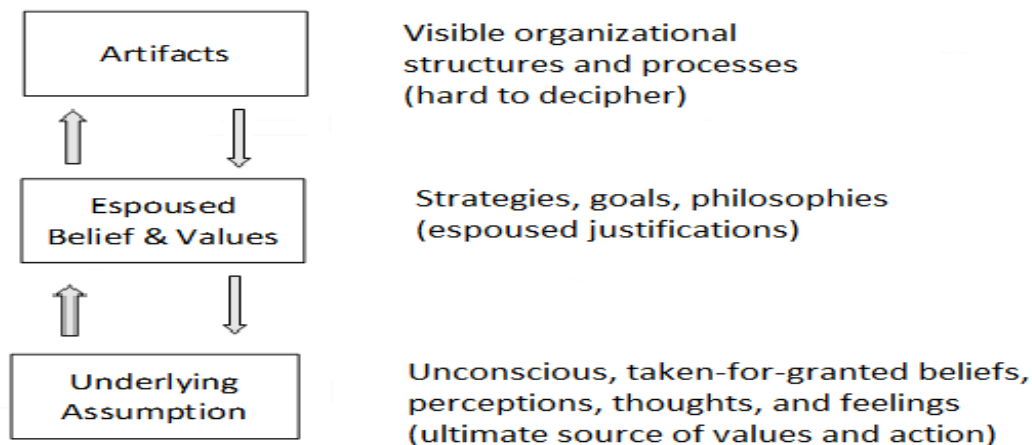


Figure 3.2 Levels of Culture<sup>49</sup>

### 3.3 PART II: SAFETY CULTURE

#### 3.3.1 DEFINITION

The term *safety culture* was initially coined within the energy industry and introduced by the International Atomic Energy Agency (IAEA) in 1991 after the nuclear reactor accident at Chernobyl.<sup>50</sup> The safety culture concept was then quickly used in various other industries such as petrochemical, steel, aviation and health. As a result, some safety culture definitions have been developed.

IAEA defined safety culture in the context of the Chernobyl disaster as, “*an assembly of characteristics and attitudes in organisations and individuals which established that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance*”.<sup>51</sup>

A further meaning of safety culture is “*the set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimising the exposure of employees, managers, customers and members of the public to conditions considered dangerous or injuries*”.<sup>52</sup> Likewise, Hudson<sup>53</sup> claimed that safety simply means, “*just make sure people don’t get hurt*”.<sup>(p2)</sup>

In addition to the above safety culture definitions, Wiegmann, Zhang, Von Thaden, Sharma and Gibbon<sup>54</sup> reported 13 different definitions. The commonalities across these definitions

include: 1) safety culture is the responsibility of everyone in an organisation at every level; 2) the behaviours of workers towards safety is affected by the safety culture in their organisation; 3) safety culture is affected by the management and supervisory system; 4) the concept of safety culture refers to the shared values among all members and groups of the organisation; 5) safety culture stresses the connection between the reward systems and safety performance; 6) safety culture of an organisation is reflected in its readiness to develop and learn from errors; 7) safety cultures are fairly stable and resistant to change.

The term “safety culture” is usually associated with some of the following terminologies:

- Safety behaviour: the behaviour needed to undertake an activity safely.
- Safety competency: the ability and capability to complete a safety assignment efficiently.
- Safety management: well-defined actions and processes to assist, train and evaluate the performance of employees in the workplace.
- Safety-critical position: a management position that has an important safety leadership role.

In safety culture literature, the most commonly cited dimensions are:

- Teamwork
- Leadership and management commitment to safety
- Openness of communication based on trust
- Organisational learning and development
- Non-punitive response to error
- Accountability
- Shared belief and value in the importance of safety

The above-listed safety culture dimensions vary in the literature, and some authors described them as subcultures, types of safety cultures, or aspects of safety culture. For instance, Reason,<sup>55</sup> debates that safety culture consists of five interdependent subcultures: a just culture, a learning culture, an informed culture, a flexible culture, and a reporting culture.

### 3.3.2 SAFETY CLIMATE

Flin, Mearns, O'Connor and Bryden<sup>56</sup> defined safety climate as the attitude and perception of workers at a given place and time. The authors added that safety climate is a snapshot of the state of the safety culture of an organisation.

One of the shortest definitions of safety climate is presented by Dedobbeleer<sup>57</sup> *“molar perceptions people have of their work settings.”*<sup>57(p97)</sup> Another common definition for the safety climate is offered by Griffin and Neal<sup>58</sup>:

*“Safety climate should be conceptualised as a higher order factor comprised of more specific first-order factors. The first-order factors of safety climate should reflect perceptions of safety-related policies, procedures, and rewards. The higher order factor of safety climate should reflect the extent to which employees believe that safety is valued within the organisation.”*<sup>58(p348)</sup>

From the definition above, some of the most common dimensions connected with safety climate are:

- Importance of safety training
- Employee commitment to safety
- Effective safety communication within the organisation
- Risk level awareness by employee
- Perceived effects of encouragement or promotion

### 3.3.3 SAFETY CULTURE VERSUS SAFETY CLIMATE

There is an overlap between the definition and concept of safety culture and safety climate.<sup>59</sup> Safety culture and safety climate are often used interchangeably in the literature, and in fact, some researchers argue that they describe the same concept.<sup>59</sup>

Historically, safety culture and climate were derived from organisational culture and climate in the 1970s. According to Guldenmund,<sup>60</sup> safety climate is used to evaluate safety attitude, and safety culture shapes that attitude.

Mearns and Flin<sup>61</sup> argued that safety climate explains staff attitudes and describes their perceptions towards safety, it can be measured quantitatively to provide a general view of safety status, whereas safety culture is a complex and enduring trait reflecting shared beliefs,

values, and underlying assumptions and expectations that require in-depth exploration. Guldenmund<sup>60</sup> conducted a comprehensive review of the literature related to safety culture and safety climate to investigate their differences. The author argued that safety climate is represented more by safety attitudes whereas a safety culture is represented more by the strong beliefs that underlie the attitudes.

In the current study, and to avoid the necessity for a complex discussion, the term safety culture will be used as it is the broader concept<sup>60</sup> that includes the assessment of thoughts, attitudes, and the effect of staff practices and behaviours towards patient safety.<sup>60</sup>

### **3.4 PART III: PATIENT SAFETY**

#### **3.4.1 DEFINITIONS OF PATIENT SAFETY**

Patient safety is a fundamental principle of healthcare. The extent of AEs in healthcare systems has been long recognised. However, the degree to which these events are acknowledged varies significantly across countries and healthcare systems. The landmark study “To Err is Human” by the IOM<sup>6</sup> in the USA, is a noteworthy work to improve the concept of patient safety in the healthcare system. Since the release of this report, some healthcare systems around the world have taken on the mission to create a patient safety culture in their health organisations.<sup>62</sup> Patient safety became a discipline and a main focus area for healthcare leaders, managers and policymakers.<sup>62</sup>

The meaning of patient safety varies among health professionals and systems. The simplest definition of patient safety is offered by the WHO Regional Office for Europe,<sup>63</sup> as the prevention of errors and AEs associated with healthcare. In 2004, WHO launched a Patient Safety Program to improve and facilitate the development of patient safety worldwide<sup>64</sup> and a new definition of patient safety emerged as, “*the absence of preventable harm to a patient during the process of healthcare*”.<sup>64</sup> Likewise, Kohn, Corrigan and Donaldson<sup>65</sup> define patient safety as “*the prevention of harms to patients*”.<sup>65(p7)</sup>

The AHRQ describes patient safety as “*the absence of the potential for, or the occurrence of, healthcare-associated injury to patients, created by avoiding medical errors and taking action to prevent errors from causing injury*”.<sup>66</sup> More definitions of patient safety are in Table 3.1.

**Table 3.1** Patient Safety Definitions

Authors	Discipline	Definition
Montoya & Kimball <sup>67</sup>		<p><u>Medicine &amp; Nursing:</u> Freedom from accidental injuries stemming from the processes of healthcare</p> <p><u>Clinical laboratory:</u> Medical errors that may occur in pre-analytical, analytical and post-analytical phases</p> <p><u>Pharmacy:</u> Reduction in medication errors and errors related to medication distribution</p> <p><u>Physical therapy:</u> Avoidance of common practice errors and seek to explore approaches for prevention</p> <p><u>Occupational therapy:</u> Errors that occur as part of standard operating procedures</p>
Gaal, Vestappen & Wensing <sup>68</sup>	Nursing & Medicine	Do not harm the patient
Runciman <sup>69</sup>	Healthcare Quality & Patient Safety	Reduction in risk of unnecessary harm associated with health
Emanuel <sup>70</sup>	Healthcare Quality & Patient Safety	Minimises the incidence and impact of and maximises recovery from AEs
Cronenwett <sup>71</sup>	Nursing	Minimises the risk of harm to patients and providers through both system effectiveness and individual performance
Heckinger <sup>72</sup>	Home Health & Disease Management	Prevention of harm to patients and reduction of errors of commission or omission
Pronovost <sup>73</sup>	Medicine/Healthcare Quality & Patient Safety	<p>Absence of the potential for, or occurrence of, healthcare-associated injury to patients.</p> <p>Created by avoiding medical errors and taking action to prevent errors from causing injury</p>
Woolf <sup>74</sup>	Medicine	Freedom from injury
Mohr, Baltaledn & Barach <sup>75</sup>	Healthcare Quality & Patient Safety	Prevention of harm caused by errors of commission and omission



### 3.4.2 PATIENT SAFETY MODELS AND FRAMEWORK

Patient safety has become a focus for clinical improvement within healthcare systems and organisations in recent years. As a result, some patient safety models were created. In this section, widely used models and frameworks of patient safety are described.

#### 3.4.2.1 The Donabedian Model of Patient Safety

In 1980, Donabedian<sup>76</sup> assessed the quality of performance in healthcare settings in his article “The Quality of Care: How Can it be Assessed” and based on this work, he developed the Donabedian Model of Patient Safety. According to the model, improvement in the structure of healthcare will improve the clinical process and eventually improve patient outcomes.

Donabedian’s model is a conceptual model that offers a framework for assessing the quality of care. It has been widely used, and focuses on three segments of the healthcare system, being structure, process and outcome (Figure 3.3).



**Figure 3.3** Donabedian Model of Patient Safety<sup>76</sup>

In this model, structure refers to the healthcare organisation where patients receive healthcare services; it includes medical equipment, staff, finance and building.<sup>76</sup> Process is the medical procedures or approach used to deliver or provide healthcare services and treatment to patients, and outcome means the impact of the provided healthcare services on patient health status.<sup>76</sup> It may also refer to the improvement of patient knowledge, behaviour and satisfaction.<sup>76</sup>

Donabedian’s model enables healthcare providers and managers to explore the risks and hazards embedded in the organisational culture and how likely these factors can cause injury or harm to patients.

### 3.4.2.2 Reason's Swiss Cheese Model

This model is based on the assumption that every system has weakness within its process and can lead to failure.<sup>77</sup> In this model, every system or process is linked to slices of Swiss cheese laid side by side, and the holes represent potential weakness or risks in each layer of the system (Figure 3.4). Some of the holes are classified as “latent” in which weakness in the system is inherent, such as weakness in the organisational design, whereas other holes are considered “active” where an individual makes an error.<sup>77</sup> This model works as a series of barriers and against errors (protective layers). For example, if an error passed through one of the holes or weakness (where a failure occurs at that point), the layer behind will stop or block any further damage or failure. In fact, holes open and close at random and each layer acts as a defence system against further failure. However, if the holes in each layer or slice of cheese align, then failure at every stage or layer of the system become inevitable.<sup>77</sup>

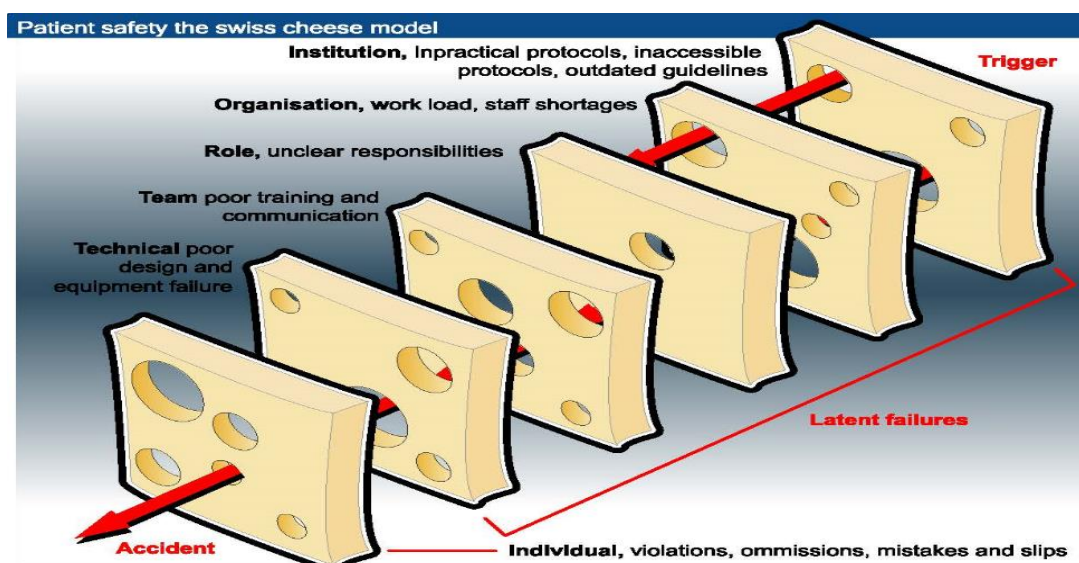


Figure 3.4 Reason's Swiss Cheese Model<sup>78</sup>

### 3.4.2.3 Manchester Patient Safety Framework

The Manchester Patient Safety Framework (MaPSaF) is a tool that can assist healthcare providers and managers to assess the culture of the patient safety improvement process. MaPSaF was initially developed at the University of Manchester to help the NHS in the UK to improve team and organisational culture.<sup>79</sup> It consists of nine dimensions, which aid

healthcare providers and managers to understand the concept of safety culture. MaPSaf can facilitate discussion within the team about problems related to safety culture.<sup>79</sup>

#### 3.4.2.4 *Assessment of Patient Safety*

The assessment of patient safety culture is considered a critical step for improving the quality of healthcare organisations. A patient safety culture assessment aims to detect weaknesses and strengths of the safety practices in healthcare organisations. It is critical to evaluate the commitment of healthcare providers and managers to safety elements to create a positive safety culture. According to Smits et al.,<sup>80</sup> if the safety culture and infrastructure of the healthcare organisation need improvement, then redesigning the hospital structure and clinical guidelines is not sufficient to achieve safe system and practice.

The most common method for evaluating safety culture is through questionnaires.<sup>81</sup> Indeed, many different types of questionnaires can be used to evaluate safety culture. There are no hard-and-fast rules to distinguish the most relevant tool.<sup>82</sup> However, with the plethora of instruments, some researchers recommend using psychometrically validated tools.<sup>83-85</sup>

These reviews helped to choose the instrument for the current study. It was important to find a tool that could be: 1) subjected to psychometric validation; 2) used in different cultures and contexts, as this study was conducted in a different culture than the Western countries where most studies have been conducted; 3) used with healthcare providers and managers at the same time.

Ginsburg et al.<sup>85</sup> and Fleming<sup>86</sup> emphasised the dominance and superiority of three instruments, namely: 1) the Hospital Survey on Patient Safety Culture (HSOPSC), 2) the Safety Attitude Questionnaire (SAQ), and 3) the Modified Stanford Patient Safety Culture Survey Instrument (MSI). Likewise, Halligan and Zecevic<sup>81</sup> argued that HSOPSC, SAQ, MSI and the Patient Safety Culture in Health Organisations (HPSCO) survey are the most commonly and widely used instruments. The Health Foundation UK<sup>87</sup> and European Network for Patient Safety (EUNetPaS)<sup>88</sup> also report that the HSOPSC, PSCHO and SAQ are the most rigorously tested and well-known tools. Table 3.2 lists the recommended tools for evaluating patient safety culture.

**Table 3.2** Reviews of Survey Instruments

Author	Included instruments	Concluding comments
Colla et al. <sup>83</sup>	Nine instruments compared on set criteria (n=24) covering four areas: Instrument characteristics, dimensions covered, psychometric testing, and how it was used	Instruments varied for the last two sets of criteria: SAQ (n=23); HSOPS (n=18)
Fleming <sup>86</sup>	Reviewed four instruments based on recommendations from Canadian Council on Health Services Accreditation by presenting description, weaknesses and strengths	HSOPSC and SAQ had similar weaknesses and strengths; main strength was benchmarking data; main weakness was length
Flin et al. <sup>89</sup>	12 instruments identified	Concluded that all reviewed instruments were at an early stage of development and needed more testing
Singla et al. <sup>82</sup>	13 instruments identified	Commonalities and differences were identified; HSOPS and SAQ advantaged from benchmarking data and psychometric properties
Halligan & Zecieve <sup>81</sup>	12 instruments identified; the review focus was concerned with patient safety in general	The most widely used were SAQ, HSOPSC, PSCHO and MSI
Jackson et al. <sup>90</sup>	Reviewed SAQ, HSOPS, PSCHO and HSC as widely used instruments	Most used: SAQ & HSOPSC, both proven at the unit level PSCHO proven at the hospital-level HSC used for workplace exposure injuries
EUNPS <sup>88</sup>	19 instruments reviewed to make recommendations for use in European Union	Recommended SAQ and HSOPS Manchester patient safety assessment framework

The patient safety assessment instruments in Table 3.2 vary in their focus and length, ranging from 7–99 safety items and 1–12 dimensions.

However, most of the reviewed literature relating to patient safety recommended the use of HSOPSC or SAQ due to their validity, psychometric properties and applicability to safety culture research. Jackson, Sarac and Flin<sup>90</sup> argued that HSPSC, SAQ and the PSCHO survey are the most appropriate tools to explore safety culture.

HSOPSC was the survey tool used in this study due to its validity, wide use and ability to be used in different cultures (Appendix A). It was developed in the USA by AHRQ after a comprehensive review of the literature on safety, patient safety, accident, medical malpractice, error reporting, safety climate, and safety culture.<sup>91</sup> HSOPSC contains 42 items and 12 dimensions to evaluate the culture of patient safety at the unit and hospital levels. The self-administered survey has been available to the public through the AHRQ website since 2004. AHRQ developed a comparative database in 2006 that can be used to compare results between different healthcare systems. By 2011, there were 472,397 respondents from 1032 hospitals in different countries.<sup>91</sup>

In addition, HSOPSC has been used in many countries around the world including Arab countries such as Saudi Arabia, Oman, Jordan, Egypt, Libya and Palestine.

#### *3.4.2.5 Patient Safety in Developing Countries*

Some studies have investigated patient safety in KSA,<sup>92-96</sup> using various tools and different dimensions to reveal different findings. The aims of these studies have ranged from attempts to develop new tools,<sup>97,98</sup> to using validated tools such as HSOPSCS or AQ.<sup>92-96</sup>

Al-Saleh and Ramadan<sup>97</sup> developed a tool to examine the impact of “human engineering intervention”<sup>97</sup> on safety in 16 Saudi hospitals. Authors claimed that the tool was valid, but it has not been used since and no further information was supplied. The study also showed different assumptions between staff in the frontline and managers in terms of the level of training and education, response to errors and the level of participation in decision making. These differences between management and staff may be an important indicator of the distance between the two groups. Managers believed that they provided adequate support, while the staff were asking for support.

It is important to note that management support is a recurrent issue in the literature on patient safety in Saudi Arabia. Walston et al.<sup>98</sup> found that the lack of management support, inadequate resources and poor reporting systems are the main influencers of patient safety. They showed that Saudi public hospitals performed better than private hospitals on the investigated measures.<sup>98</sup> This contradicts another Saudi study conducted by Al-Ahmadi<sup>92</sup> who concluded that private hospitals had more positive perceptions of overall patient safety grades (72.7% rated good or excellent) than public hospitals (58.2%). One explanation for this is the difference in measurements; Walston et al. used their tool whereas Al-Ahmadi adopted HSOPSC. Al-Ahmadi indicated that management support, organisational learning, communication and feedback about errors, and teamwork were the main contributors to the overall patient safety score.

Al-Ahmadi<sup>99</sup> conducted a study to evaluate staff attitudes towards patient safety in 13 public and private hospitals in Riyadh, KSA. The *Teamwork within Units, Feedback & Communication about Error* and *Organisational Learning–Continuous Improvement* were dimensions of strength. However, *Non-punitive Response to Error, Teamwork across Units, and Staffing* were areas with potential for improvement. Similar results were reported by Aboshaiqah and Baker<sup>96</sup> in a study using HSOPSC to identify the factors perceived by nurses as contributing to patient safety culture in a tertiary hospital in Riyadh, KSA. The study showed two areas of strength; *Organisational Learning–Continuous Improvement* and *Management Support for Patient Safety*. However, the authors did not indicate whether these two dimensions were considered contributing factors to patient safety culture. Both studies suggested that the “zero” responses to the number of errors reported in the past 12 months were a significant sign of the under-reporting culture.

Almutairi, Gardner and McCarthy<sup>100</sup> collected data from nurses in a tertiary hospital in KSA to explore staff attitude towards patient safety. The result showed that nurses perceived safety climate as “unsafe”<sup>100(p187)</sup>, and there were significant differences in nurses’ perceptions of the safety climate based on their nationality.

Another two studies examined nurses’ attitudes towards the safety climate in KSA by adopting different versions of the Safety Attitude Questionnaire. Zakari<sup>95</sup> used the ambulatory version in four units and Alayed, Loof and Johansson<sup>101</sup> used the intensive care unit (ICU) version. In his study, Zakari found significant differences between nurses and nurse managers in all safety

dimensions. Alayed, Loof and Johansson concluded that all safety dimensions needed improvement. Both studies offered recommendations to improve patient safety such as improve staffing levels, provide more equipment, encourage teamwork concept, improve communication system, and increase management support towards safety.

### **3.5 PART IV: FACTORS AFFECTING PATIENT SAFETY CULTURE**

#### *3.5.1 INTRODUCTION*

This review was conducted in a systematic method to explore the common factors affecting patient safety culture. It also explored how these factors affect safety practice among healthcare providers and managers in healthcare organisations. In addition, it aimed to identify the gap in the current body of knowledge related to safety culture. It starts with a description of the literature search strategy, selection of research studies, and discusses search outcome.

#### *3.5.2 SEARCH STRATEGY AND DATA SOURCES*

A comprehensive search was conducted to fulfil the aim of this literature search. The search began by identifying keywords and terms relevant to the subject matter. A combination of search keywords was used to explore the literature thoroughly. The search keywords were as follows:

("patient safety culture" OR "culture of patient safety" OR "patient safety" AND factor\* AND effect\* OR influenc\* AND "perception" OR "attitude" AND health\* AND provider\* OR staff\* OR work\* OR manag\* OR nurs\* or doctor\* OR allied AND measure\* OR assess\* OR evaluat\* OR explor\* OR stud\* OR examin\*).

The literature search was performed using the "OneSearch" multi-database search engines accessed through The University of Western Australia (UWA). The resources accessed in this search were electronic databases including Ovid-MEDLINE, Ovid PsycINFO, PubMed, ProQuest and Nursing and Allied Health Literature (CINAHL Plus).

#### *3.5.3 SELECTION OF RESEARCH STUDIES*

The search was restricted by some inclusion criteria to keep it focused on the study aim. Only articles/publications that met the inclusion criteria were included (see Appendix B). The inclusion parameters were: full article available online, written in English, publication date

from 2007 to 2017, and used in human research. The rationale to limit the time span for the review to 10 years was based on the fact that during this period there had been significant advances worldwide concerning the need for patient safety awareness. However, while the search was restricted to English, a number of the articles retrieved were from non-English speaking countries but published in English.

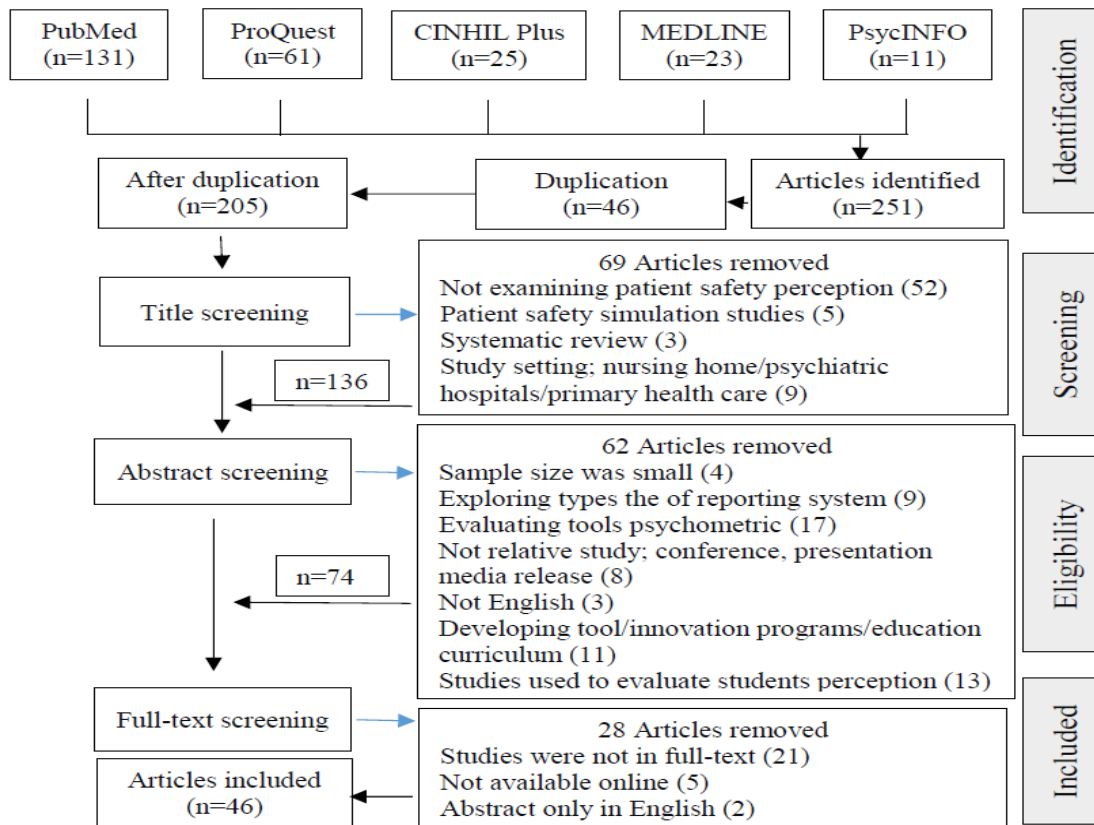
To maintain the focus on the aim of review, the search for the keywords “patient safety culture OR culture of patient safety of patient safety” was limited to the title of the article/publication. In addition, any study conducted in military or hospice or psychiatric facilities were excluded as most are not public, private or have special healthcare protocols. Finally, there were some exclusion criteria for the types of papers reviewed, i.e. unpublished studies or unreleased media were not included.

#### *3.5.4 SEARCH OUTCOME AND ABSTRACTING DATA*

After applying the inclusion and exclusion parameters, 251 articles were identified. Figure 3.5 shows the flow chart of the article selection process.

Abstraction of the retained studies was completed in two stages: (1) all included studies had to fulfil and meet the inclusion criteria, and (2) summary data about the study characteristics were collected using a structured form developed for this review and included author(s), year, location, title, sample, setting, method of data collection, study design, data analysis and results (see Appendix B).





**Figure 3.5** Flow Chart of the Literature Selection Process

In keeping with the aim of this section of the review, the findings from the literature were organised under eight main headings:

1. Hospital management (Leadership) support for patient safety
2. Error reporting and non-punitive response
3. Organisational learning
4. Communication openness and feedback
5. Handoffs and patient transition
6. Teamwork
7. Staff level
8. Other factors

#### 3.5.4.1 *Hospital Management (Leadership) Support for Patient Safety*

The review confirmed the importance of the management team in promoting patient safety.<sup>102</sup> According to the National Quality Forum (NQF), healthcare managers have both legal and “moral obligations”<sup>103p(15)</sup> to ensure that they implement high-quality systems in their hospitals. In fact, managers are in a position that enables them to mandate policies and procedures related to the culture of patient safety in their workplaces.<sup>104</sup> A study conducted in Palestinian hospitals investigated the relationship between the dimension of patient safety culture and the rate of AE reporting among 316 health staff.<sup>105</sup> The findings revealed that healthcare providers working with managers supporting patient safety were more likely to report AEs in their work.<sup>105</sup>

Merrill<sup>106</sup> conducted a study to investigate the association between nurse-manager leadership style and safety practices among 466 RNs in 40 nursing departments across nine hospitals. The bivariate and regression analysis indicated that leadership style was a positive contributor to patient safety practices.<sup>106</sup> Similar findings were revealed in a study conducted in China that investigated the attitude of 463 RNs towards AE reporting.<sup>107</sup> The study showed, in the multiple logistic regression model, a significant correlation between the positive perception of hospital management for patient safety and the frequency of errors reported by nurses. The positive perception of managers has improved the reporting of errors and subsequently improved patient safety culture.

Frankel et al.<sup>108</sup> evaluated the impact of WalkRounds (WalkRounds is the visit activity of hospital executives to patient-care areas to improve and discuss safety issues with healthcare providers) on patient safety climate in 21 patient-care areas in two hospitals in the USA.<sup>108</sup> The results demonstrated significant improvements in patient safety dimensions, specifically in error reporting awareness, learning from errors, discussing patient safety concerns, and feeling encouraged to report errors.<sup>108</sup> It could be argued that a positive perception of patient safety among managers/leaders/management team is associated with better safety practices among healthcare providers.

In the Arabian health context, two studies were conducted to explore the role of leadership and patient safety culture. One study by Alahmdai<sup>92</sup> examined the extent to which hospital culture supported patient safety in Riyadh hospitals, KSA, which involved 223 healthcare

professionals and managers. The second study by El-Jaradli<sup>109</sup> was undertaken to understand the relationship between patient safety predictors and outcomes among 6807 hospital employees in Beirut, Lebanon. Both studies used the HSOPSC instrument to collect data. Findings from these studies showed a significant relationship between the positive perception of safety culture among respondents and the amount of management support towards patient safety. In addition, both studies emphasised that the existence of safety culture in hospitals depended mostly on the support of hospital management.<sup>92,109</sup>

The relationship between the management team and staff behaviour is important for improving safety culture, particularly in KSA where culture affects management styles and behaviours.<sup>110</sup> Hofstede proposed that people are affected by their culture and called it the effect of power distance. Power distance is defined as *“a measure of the interpersonal power of influence between a superior and a subordinate as perceived by the subordinate”*.<sup>90(p72)</sup>

According to Hofstede, countries are divided into high or low power distance on the power distance index (ranged from 1 = low to 100 = high). In high power distance countries, it is expected that power will be distributed unequally, everyone will have a specific place in the hierarchy of power, people will easily accept autocratic and paternalistic power relations, and a subordinate will acknowledge the power of superiors based merely on their position in the hierarchy of authority. KSA is classified as a high power distance country (scoring 95 out of 100).

The ability of the management team to exercise power over employee perception in KSA is very high and, consequently, staff will react to the behaviour of top-managers, as they perceive them. Involving healthcare managers and policymakers is one of the most significant factors to improve patient safety culture in the Saudi context. In this study, it was important to consider managers as a contributing factor to patient safety and include them in the two phases of data collection.

#### 3.5.4.2 *Error Reporting System and Non-Punitive Response*

The main purpose of the error reporting system in hospitals is to improve patient safety by examining the data that were collected. Reporting errors and non-punitive responses to these errors are important dimensions when evaluating patient safety culture.<sup>111</sup> Data collected from error reports will be used as an opportunity to learn from these errors and increase

accountability and adopt a new policy.<sup>112</sup> However, the absence of good reporting systems will decrease improvement opportunities,<sup>113</sup> and the same errors may occur repeatedly.<sup>112</sup> According to Walston et al.,<sup>98</sup> proper error reporting systems and adequate resources in healthcare settings are essential patient safety standards.

In Canada, Cook, Dunscomb and Lee<sup>114</sup> conducted a quantitative study among 125 healthcare professionals in a major academic cancer centre to evaluate staff perception on incident analyses, their personal experience, and to what extent they learned from these incidents. The study concluded that learning from errors plays a crucial role in improving patient safety culture and reducing the rate of errors significantly. However, the study sample size ( $n = 125$ ) was relatively small, which may affect the generalisation of findings.

AEs reporting systems are ubiquitous in healthcare organisations and the mainstay of activities to explore patient safety errors and quality problems.<sup>115</sup> Reporting systems offer data that can be used as a quality indicator and staff performance monitor.<sup>116</sup> However, a poor reporting culture or punitive response to errors will affect the staff reporting rate.<sup>117</sup> Kaldjian et al.<sup>117</sup> collected data on medical errors to investigate actual reporting of errors from 338 participants in USA. The results revealed that 17.8% of participants had reported an actual minor error and only 3.8% admitted not reporting actual major errors.<sup>117</sup> Noteworthy, only 54% of participants knew the proper method for reporting errors, and only 39.5% knew the types of errors to report. The results also indicated that the willingness to report errors was significantly associated with believing that reporting improves patient care.<sup>117</sup>

Flotta et al.<sup>118</sup> investigated the knowledge of 696 doctors and nurses about patient safety and their attitude towards error prevention and reporting. Authors indicated that respondents showed a low rate of error reporting due to system failure, workload, stress, working hours, and fear of malpractice litigations.<sup>118</sup>

In a focus group, a qualitative study involved 16 Canadian nurses to understand their perception of incident reporting practices and to identify factors that facilitate or constrain this practice. Waters et al.<sup>119</sup> reported that nurse perception was strongly affected by their work culture and teamwork practices. Nurses described errors as out of their control and could lead to many incidents. However, fear of litigation affected nurse perception and the

reporting of these incidents. In addition, participants indicated that poor and inappropriate reporting tools and unit culture were barriers to reporting errors.

A significant barrier to reporting errors is the punitive response to errors.<sup>101</sup> Potylycki et al.<sup>120</sup> reported that administrators tend to blame staff rather than the system, and the fear of incident consequences hinders staff from reporting. Hartnell, MacKinnon, Sketries and Fleming<sup>121</sup> from Canada also carried out a study to examine the barriers to medication error reporting in four community hospitals. They identified a number of factors including; professional identity (the fear of appearing incompetent before colleagues and patients), reporting processes (time and work involved, information about the process), organisational culture (how things are done within the organisation because of reporting), and the fear of reprisal or malpractice suits.<sup>121</sup> However, the author claimed that healthcare professionals were more willing to report AEs if the reporting process was more straightforward, if they received adequate training about reporting, and if they received feedback about errors. One possible explanation to justify the reluctance of health professionals to report errors could be differences in power, the relationship between different professionals and socio-cultural barriers.<sup>121</sup>

The effect of the socio-cultural issues on the tendency of reporting errors was studied in three Arabic countries: Lebanon,<sup>109</sup> KSA<sup>92</sup> and Jordan.<sup>122</sup> These studies assessed the attitudes of nurses and other healthcare providers towards patient safety culture and medication errors. All of these studies were quantitative and used questionnaires to collect data. The results indicated that healthcare professionals perceived the dimension of non-punitive responses to errors in their organisation negatively. Therefore, they tended to fail to report their errors because they were afraid to lose their jobs or to be subjected to any form of disciplinary action.

This review has revealed a strong relationship between non-punitive responses to errors, reporting systems and patient safety. AE data can be used to find solutions to problems. Data can be shared with a broader audience, regionally or internationally, e.g. the “Data Linkage” system in the Department of Health in Western Australia. Data Linkage is a sophisticated technique developed by highly specialised computer programs that enables the collection of data about persons, families, places or events, and at the same time protects personal privacy. It offers demographic data and clinical data, and can be used to track information, conduct

research, investigate potential projects, and/or monitor the outcome of diseases. If such systems are adopted in the healthcare system in KSA, it will motivate health providers and managers to report errors more often and facilitate more research in healthcare areas.

#### *3.5.4.3 Organisational Learning and Continuous Patient Safety Improvement*

Continuous organisational learning and improvement is an important dimension in patient safety culture.<sup>123</sup> It can be described as the process of improving organisational performance, through the efficiency and effectiveness of shared knowledge and skills.<sup>92</sup> In healthcare organisations, AEs can occur more frequently than other organisations and may harm a single patient rather than a large group.<sup>124</sup> Therefore, continuous learning and safety improvement must be an organisational aim and priority in all healthcare facilities.<sup>124</sup> However, the lack of reporting, blame culture, and poor reporting systems are factors affecting the learning and improvement process in healthcare facilities.<sup>124,125</sup>

Gagnon et al. conducted an exploratory case study to examine the effect of introducing a learning organisation program in a health and social services centre in Canada.<sup>126</sup> The authors used a purposive sampling approach to interview ten people face-to-face. The study revealed that the learning organisation program was associated with positive nurse practices and improved quality of patient care.<sup>126</sup> Emanuel et al.<sup>70</sup> confirmed that the lack of consistent reporting or learning systems in healthcare organisations would result in the persistent repetition of the same medical errors.

Clark et al.<sup>127</sup> conducted a study to examine the effect of AE learning systems, and patient safety improvement provided further evidence on the importance of organisational learning. The study examined 2,506 reports of patient safety incidents over five years and reported that the adoption of a learning approach in health organisations had contributed significantly to reducing the rate of errors. However, Clark et al. suggested that the application of organisational learning policy is subjected to the existence of an effective error reporting system.<sup>127</sup>

Benn et al.<sup>128</sup> agreed that the role of feedback in improving patient safety in hospitals is important. Feedback from the management level is a critical factor to reinforce a sense among healthcare providers that their error reports and recommendations are considered useful and helpful for improving patient safety culture.<sup>128</sup>

The aim of organisational improvement and learning is to identify the causes of errors with the aim of reducing errors, improving reporting methods, analysing error reports, and implementing and monitoring new policies. The actual implementation of policies to ensure that errors are learned from is not always easy in healthcare organisations, particularly in developing countries.<sup>129</sup>

#### 3.5.4.4 *Communication Openness and Culture of Patient Safety*

Communication openness is an integral part of patient safety culture and requires cooperation between healthcare teams to achieve the desired outcomes.<sup>130,131</sup> However, a lack of communication or communication failure is considered a leading cause of AEs.<sup>132,133</sup> AEs have the potential to cause harm to patients, even unexpected death.

An extensive review of the literature revealed that effective communication does not continually occur in healthcare organisations. For instance, a study conducted by Sutcliff, Lewton and Rosenthal showed that role ambiguity, hierarchical differences, and conflicting roles contribute to communication failure.<sup>134</sup> Another study showed that verbal communication between healthcare providers is inconsistent.<sup>135</sup>

It can be argued that many AEs can be traced to ineffective communication and poor teamwork.<sup>136</sup> For example, the language differences between healthcare teams and patients in KSA has been demonstrated as a barrier to effective communication in patient care.<sup>136</sup> In addition, a review of reports from the European Commission project revealed that ineffective communication and poor teamwork between healthcare providers is at the root of 25–40% of AEs.<sup>137</sup>

Reader, Fline, Mearns and Cuthbertson<sup>138</sup> conducted a cross-sectional study to examine nurse and doctor perception of inter-disciplinary communication in four hospitals in the UK. The study surveyed 136 nurses and 48 doctors working in Intensive Care Units (ICU) that identified a low level of communication between doctors and nurses and between trainee doctors and more senior doctors.

The literature also showed that communication problems could occur between healthcare staff and managers, e.g. a study by Braaf et al.<sup>139</sup> in three general hospitals in Australia that aimed to understand the perception of service providers of organisational communication and recognise areas for improvement among 281 healthcare professionals. The results showed

that respondents were dissatisfied with the communication process from the hospital's top-level management and they perceived the communication of information to be inadequate. Moreover, the results showed that patient safety might be compromised by poor documentation of patient information and handoff procedures during shift exchange. Researchers concluded that patient safety in these hospitals could be affected by inappropriate organisational communication policies and process.<sup>139</sup>

However, communication problems and associated harm and effects on patient safety can be minimised using communication tools.<sup>140</sup> For example, Clark et al.<sup>141</sup> performed an intervention study to evaluate and describe the PACT (Patient Assessment, Assertive Communication, Continuum of Care, and Teamwork with Trust) project to improve communication between staff at handoff in a private hospital in Victoria, Australia. In the baseline assessment, 85% of nurses reported that communication between staff needed improvement. After the implementation of the SBAR (Situation, Background, Assessment and Recommendation), the results showed that 68% of nurses believed that the handoff process had improved and 80% were more confident to communicate with doctors.<sup>141</sup>

No doubt, communication is a critical aspect of patient safety culture, especially in a multidisciplinary environment where professionals from different countries work together at the same time on the same patient. Nonetheless, continuous evaluation of the communication process in healthcare organisations can help to identify areas for improvement and prevent communication failure.

#### 3.5.4.5 Handoffs and Patient Transition

Patient handoffs and transition from one place to another in healthcare settings are critical processes in patient safety culture.<sup>142</sup> Handoff in clinical settings refers to *“the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis”*.<sup>143(p197)</sup> There are different forms for handoffs and transition within healthcare settings.<sup>144</sup> For example, inter-departmental handoffs, such as between the emergency services department and patient admission ward. Another form of handoffs is in inter-shift in which healthcare can be handed over to another professional, for example between an anaesthetist and the surgeons in an operating room. Finally, a handoff could be an exchange



that takes place between medical shifts or when a patient is discharged from hospital to home.<sup>144</sup>

The number of clinical handoffs is very high to ensure the continuity of patient healthcare. For example, each year, it is estimated that >300 million handoffs occur in the USA,<sup>145</sup> >100 million in England<sup>146</sup> and >40 million in Australia.<sup>147</sup> These numbers make clinical handoffs arguably the most significant critical point in the communication process between healthcare providers in the delivery of patient care.

However, handoffs can be a high-risk process that negatively affects the continuity of patient care and may lead to unwanted events if performed unprofessionally. Bost, Wallis, Patterson and Chaboyer<sup>148</sup> conducted a systemic review about clinical handoff procedures between ambulance services and emergency departments in the USA. In this review, researchers explored 252 documents of the clinical handoffs. The review revealed issues associated with handoff procedures, which were presented in three themes: (1) important information about patient care could be overlooked or missed during clinical handoffs, (2) structural handoffs (written and/or verbal) can improve information exchange between health staff, and (3) a multidisciplinary handoff education program can improve the quality of handoff information about patient healthcare. The authors recommended some practices to improve handoff procedures, such as the use of notes, adoption of a formal and standardised format during handoffs, and development of national handoff guidelines.<sup>148</sup>

A similar qualitative study was conducted in Denmark to explore the factors that affect patient handoffs from ambulance services to hospitals in Denmark.<sup>149</sup> Siemsen et al.<sup>149</sup> asked 47 physicians and nurses in semi-structured interviews about their attitudes and experience towards clinical handoffs. They found that important clinical information about patient care can be missed during handoffs. Furthermore, eight risk factors were identified in handoff situations including organisational factors, infrastructure factors, professional development, communication weakness and teamwork awareness. However, the researcher observed that a structured handoff, such as the written handoff process, can improve patient information exchange between staff. They highlighted that multidisciplinary education programs about handoffs might improve the handoff process and eventually improve patient safety.<sup>149</sup> In another study that adds weight to the previous findings, Pezzolesi et al.<sup>150</sup> reached similar results in which human factors were critical in the handoff process, including communication

problems between healthcare staff and poor teamwork policies. The authors suggested that the handoff process can be improved with standardised handoff instruments and continuous staff development programs.<sup>150</sup>

As revealed in the literature review, education programs and staff development are the main keys in the improvement of handoff processes. Nagpal et al.<sup>151</sup> conducted an observational study that sought to improve the post-operative handoff practice in one hospital in the UK. They examined 90 handoff processes in different departments in British hospitals and introduced 40 new handoff protocols but kept 50 old handoff practices. Staff were given a series of education and training sessions about the new protocols and the findings showed significant improvement in the quality of handoffs, particularly in relation to teamwork and communication processes. In addition, the rates of information omissions and task errors were reduced.<sup>151</sup>

#### *3.5.4.6 Teamwork and Patient Safety Culture*

Teamwork between healthcare providers is critical to patient safety when providing healthcare services.<sup>152</sup> Teamwork in healthcare settings can be described as two or more healthcare providers who interact interdependently sharing the same purpose and working towards a defined aim that benefits from leadership and maintains stability through discussion and problem-solving<sup>153</sup> In fact, healthcare, by definition, is the provision of health services by a multidisciplinary profession in which doctors, nurses and other healthcare professionals should communicate and work as a team to provide safe healthcare services.<sup>154</sup>

Studies have evaluated the effect of teamwork on patient safety and proven the importance of teamwork in healthcare practice.<sup>155-157</sup> To explore the importance of teamwork, Bristowe et al.<sup>158</sup> ran focus groups in four large maternity departments in England to evaluate the experience of healthcare staff towards the effectiveness of teamwork during medical emergencies. The results demonstrated that an effective teamwork approach in emergency cases required good team leadership. The study participants described a good team leader as one who has good communication skills to communicate with both staff and patients.<sup>158</sup>

In Korea, Hwang and Ahn<sup>159</sup> conducted a cross-sectional study to examine the relationship between error reporting and the level of teamwork among nurses in a Korean hospital. Of the 674 nurses that participated in this study, 522 reported that they had at least one AE in the

last six months and only 53% indicated that they always or usually reported errors. However, the teamwork dimension was significantly associated with better reporting among nurses. In particular, nurses who had a higher teamwork communication score were more likely to report AEs.<sup>159</sup>

A similar study conducted in Jordan with 381 RNs produced a positive correlation between teamwork and patient safety culture. The study also showed a positive correlation between teamwork and nurse perceptions of providing good quality healthcare for their patients. Another study conducted in Jordan which examined the perception of 242 nurses in five hospitals to patient safety.<sup>160</sup> The results showed that teamwork, as a safety dimension, had the highest average percentage of positive responses. In addition, the teamwork dimension was positively and significantly associated with the four outcome dimensions of safety culture, namely the overall perception of safety culture, the frequency of error reporting, patient safety grade, and the number of errors reported in the last 12 months.<sup>160</sup>

Improving the perception of teamwork and training could significantly improve patient safety and reduce AEs.<sup>161</sup> Teamwork educational interventions and training programs can promote a positive perception of teamwork and a better understanding of the principles of teamwork. However, teamwork barriers, such as professional hierarchies, staffing levels, culture, and background characteristics can affect teamwork and may lead to patient harm.<sup>162</sup>

#### *3.5.4.7 Staffing Level and Patient Safety*

*Staffing* is a significant dimension in the culture of patient safety.<sup>163-165</sup> There is strong evidence that shows that staffing levels in healthcare settings play an important role in the quality of care and patient safety.<sup>165,166</sup> However, shortages in the number of health professionals is considered a serious factor that is a threat to patient safety.<sup>167</sup>

In Sweden, a study was conducted to examine how 9,236 nurses working in patient-care units in 79 acute hospitals assess patient safety in their workplace and to identify the work factors that related to their assessment.<sup>168</sup> The study revealed that work factors (staffing and resources) were significantly related to the nurses' perception of patient safety.

It is vital to examine the prevalence of "left undone care" due to staff shortages. Ball et al.<sup>169</sup> examined the nature and prevalence of patient care that was left undone by nurses in the UK National Health Service among 2,917 RNs in 401 wards of 46 general hospitals. Almost two-

thirds (86%) of nurses indicated that one or more healthcare activities had been overlooked due to lack of time. The ratio of patients per nurse was significantly linked with the incidence of “left undone care”.<sup>169</sup>

The above findings are supported by a study by Cimiotti, Aiken, Sloane and Wu<sup>170</sup> that showed the effect of staffing levels on patient quality of care and outcomes. The study was conducted in 161 hospitals in the USA, with 7,076 RNs involved in the estimation of the incidence rate of urinary tract and surgical site infections. The results showed a significant association between patient to staff ratios and the incidence of hospital infection. It also indicates that the hospitals with an adequate level of nurses had fewer hospital infection incidences.<sup>170</sup>

There is a lack of the research related to staffing levels and “left undone care” in Arab countries. However, significant research was conducted by Al-Khandari and Thomas<sup>171</sup> in Kuwait that involved 780 RNs from five hospitals and showed a positive correlation between the workload of nurses and the prevalence of errors. Another study conducted in KSA involved a sample of 1,224 health professionals in public and private hospitals and showed similar findings.<sup>99</sup> The study also showed that *Staffing*, as a dimension of safety culture in public and private hospitals, had a negative effect on patient care and is an area that requires urgent improvement.<sup>99</sup>

#### 3.5.4.8 Other Factors Affecting Patient Safety

There is evidence to suggest that job and demographic characteristics of healthcare providers and managers influence the positive perception of patient safety culture such as job satisfaction,<sup>172</sup> working hours,<sup>173</sup> direct interaction with patients,<sup>174</sup> education level,<sup>175</sup> years of work experience,<sup>176</sup> gender,<sup>177</sup> nationality,<sup>178</sup> staff position<sup>172</sup> and age.<sup>179</sup> Aboshaiqah and Baker,<sup>96</sup> in their study to identify factors that nurses perceive as contributing to patient safety culture in a hospital in Riyadh, KSA, reported significant differences in the perception of safety culture based on age, years of work experience, language spoken and length of shift.<sup>96</sup> A similar study in Jordan showed that older nurses responded better to patient safety than younger nurses.<sup>180</sup> However, this study was limited to nurses, although patient safety is the responsibility of everyone in the healthcare organisation. Holden, Watts and Walker reached similar conclusions in their study conducted in four US Air Force ambulatory care facilities among 213 health professionals.<sup>181</sup> They examined the differences between professional

groups towards patient safety climate and identified significant differences in the safety score based on age where younger staff scored lower scores on the overall safety scale than the older age group.<sup>181</sup>

Another study by Raftopoulos and Pavlakis<sup>182</sup> evaluated the safety culture in Intensive Care Units (ICU) in five regional public hospitals in Cyprus, which indicated that participant age and work experience were influencing factors on the perception of patient safety culture. Nonetheless, only nurses were selected as participants and the sample size was 132, which may limit the generalisability of the findings.

Education level is another factor that influences the perception of patient safety culture. Pringle et al.<sup>124</sup> conducted a survey using Likert scale questions to evaluate how healthcare settings use safety climate information to improve patient safety culture in 25 western Pennsylvanian hospitals. The results identified variations in the safety attitude among healthcare providers, and education level was an influencing factor such that staff who had a higher level of education were more likely to agree that management in their organisations made patient safety a priority and their hospital's culture encouraged AE reporting. Haugen et al.<sup>183</sup> from Bergen, Norway also had similar findings, where staff in operating rooms with lower levels of education and no direct contact with patients had negative perceptions of the patient safety climate.

Work experience has been connected to the positive perception of safety culture in some studies.<sup>184,185</sup> For example, In-Sook et al.<sup>186</sup> identified that healthcare providers in Korea who had spent more years in their current unit had a significantly higher positive response score on the patient safety survey. In another study, supporting the effect of work experience on safety perception, conducted by Shaw et al.<sup>187</sup> in the USA, showed that nurses and doctors with <3 years of work experience had a higher safety climate score than others with more experience.

Job satisfaction is a further factor that affects patient safety.<sup>172,188,189</sup> A study conducted in a hospital in Spain that examined the relationship between job satisfaction and safety culture showed a significant effect of job satisfaction on participants' perception of safety culture.<sup>190</sup> Higher scores for job satisfaction were positively correlated with higher perceptions of safety

culture. However, socio-demographic characteristics had little effect on the perception of safety culture.<sup>190</sup>

### **3.6 GAPS IN LITERATURE**

The literature review shows patient safety is a worldwide public health problem. In Western countries, the review identified that counterfeit and substandard drugs, health care-associated infections and the challenges of ensuring a trained and knowledgeable workforce needed special attention.<sup>63</sup> As a result, a number of patient safety strategies were developed and implemented to address these challenges.

However, many of these methods cannot be applied to different countries in the Middle East as they are costly or inappropriate to the local culture, context and circumstances. It is therefore important to identify priorities at the local level and revise the global list of patient safety periodically to benchmark any changes.

It is significant to investigate the effect of manager perception and their management style on patient safety culture. Most of the available studies in the field of patient safety focus on the perception of healthcare providers rather than the actual culture of patient safety. Further research on the limitations and challenges affecting the abilities of leaders and managers to improve the safety culture among their employees and to manipulate the associated challenges such as low reporting rate, poor communication and a shortage of staff is needed. In addition, there is a dearth of patient safety studies among healthcare providers and managers in small and remote hospitals not only in KSA but in the available literature.

### **3.7 SUMMARY**

After exploring the literature on organisational culture and organisational climate, the distinction between the two constructs is not sharp. Rather, it overlaps and, to some extent, has different research traditions. The exact distinction between the two constructs remains a matter of debate.<sup>191</sup>

This chapter reviewed the relevant literature on patient safety culture. The first part explained the concepts, types and levels of culture. It then defined patient safety culture and the differences between safety culture and safety climate. In addition, it highlighted the

dimensions and models of patient safety culture and illustrated patient safety assessment methods and current patient safety in Saudi Arabia.

The second part detailed the systematic search for factors affecting patient safety culture. It presented the literature search strategy, data sources and search outcomes. In addition, it identified the importance of management support for patient safety, the necessity of error reporting systems in hospitals, and the role of organisational learning in promoting patient safety. Furthermore, it discussed the importance of communication openness and feedback, teamwork, and the effect of staff levels on patient safety.

Chapter 4 presents a detailed discussion of the research methodology that was adopted in this study.

## CHAPTER 4. METHODOLOGY

### 4.1 INTRODUCTION

This chapter explains the research design and methods used to achieve the research aim and objectives stated in Chapter 1. The chapter is divided into three sections to help the reader understand the flow of the research process. The first section offers an overview of the study and includes the research design, study settings, study population, inclusion criteria and ethical considerations. The second section explains the quantitative phase (Phase I) of the study and details the quantitative research design, data collection tool, reliability and validity of the data collection tool, tool translation process, pilot study, sampling method, data collection, response rate and data analysis. The third section explains the qualitative phase (Phase II) of the study and describes the qualitative approach, sampling technique, data collection methods and procedure, interview process, qualitative data analysis and rigour.

### 4.2 SECTION 1: OVERVIEW OF THE STUDY

#### 4.2.1 RESEARCH DESIGN

This study aimed to identify the factors affecting patient safety culture in 15 public hospitals in the Asir Region, KSA. A mixed method approach was used, adopting an explanatory sequential design. This approach was implemented in two phases: Phase I involved quantitative data collection and analysis and Phase II involved qualitative data collection and analysis.<sup>192</sup>

The use of the mixed method approach in social and behavioural sciences has been well established since the 1960s<sup>193</sup>. As this concept has grown, the literature has expanded and presented different definitions and designs. One of the most cited definitions of the mixed method research is “...the type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and corroboration.”<sup>194(p123)</sup>

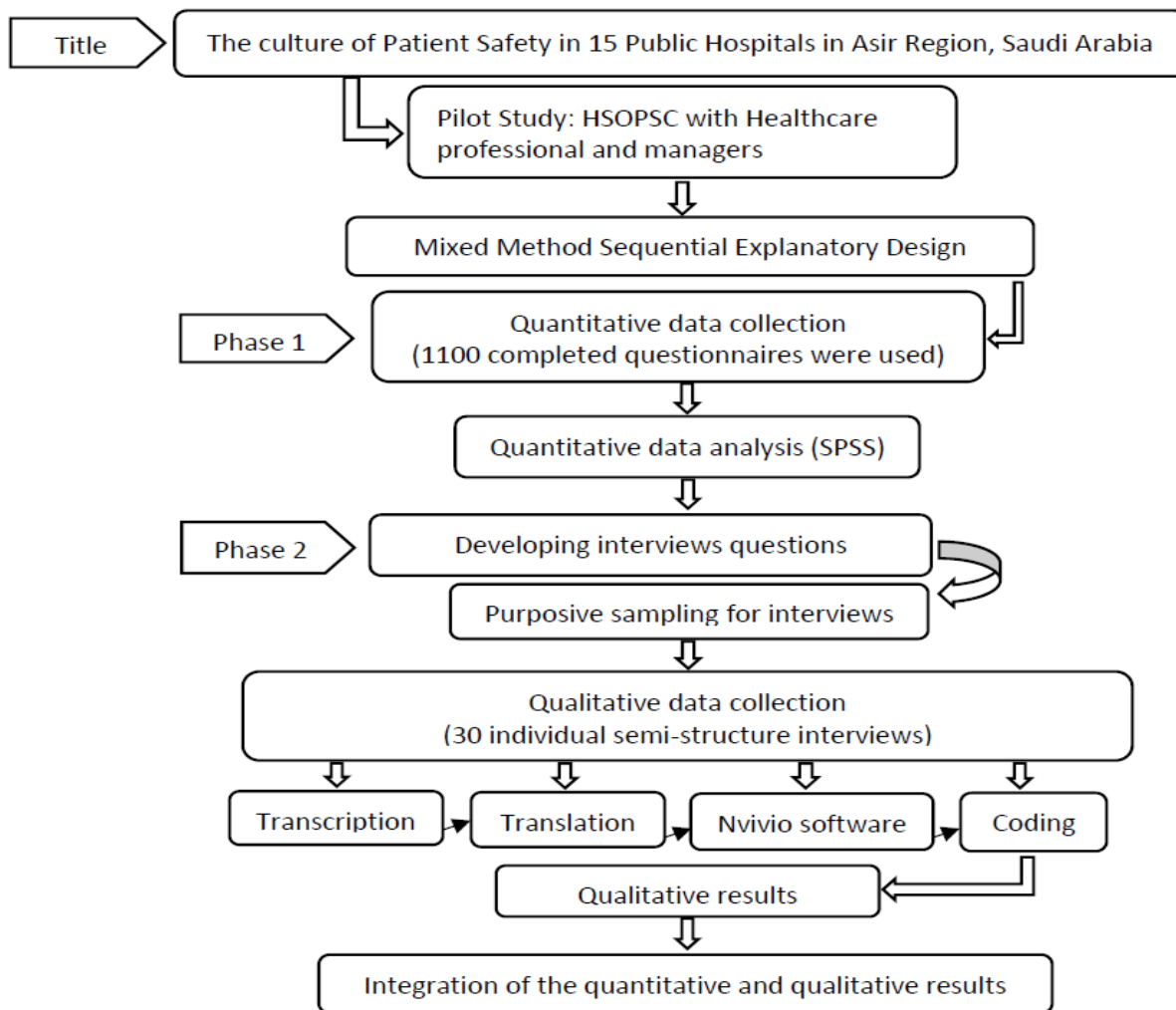
The mixed methods design can increase the potential to detect invisible causes of a phenomenon that might otherwise be missed. It was selected for this study because patient safety culture is quantitatively oriented and a validated tool is used to evaluate the constructs



of patient safety culture.<sup>81,195</sup> In addition, qualitative research is used to complement the quantitative research to help explain the findings and enable a greater degree of understanding.<sup>192</sup> Creswell and Plano-Clark<sup>192</sup> argue that a combination of quantitative and qualitative approaches offers a greater understanding of the research topic than just one method. The quantitative method can identify factors that are statistically related but might fail to explain why they are related. Thus, combining a qualitative method can help to identify important concepts and corroborate the results from the statistical analysis.<sup>196</sup> This type of research is classified as a quantitative dominant mixed method research design (QUAN-qual).<sup>197</sup> By selecting this method, the researcher depends mainly on quantitative data while adding qualitative data to integrate the findings for a deeper understanding of the research problem.<sup>198</sup>

The QUAN-qual method is acceptable in the social and health disciplines, and considered applicable for evaluating the factors that influence patient safety culture.<sup>192</sup> The findings are likely to make an important contribution to the safety literature generally and, more particularly, to the literature on patient safety culture.

The mixed method design of this study is presented in Figure 4.1. It is divided into two phases. Phase I involved the collection and analysis of the quantitative data using a validated self-administrated questionnaire, namely the Hospital Survey on Patient Safety Culture questionnaire (HSOPSC). This instrument is explained in detail in Section 4.3. The results from this phase were then used as a framework to design and conduct Phase II (qualitative data collection and analysis) of the research. The statistical evidence from Phase I was combined and connected with the personal experience from Phase II to build a greater understanding of patient safety culture in public hospitals. For example, interview questions in Phase II were developed following the analysis in Phase I. In addition, potential participants for face-to-face interviews were selected and/or asked to join the interviews in Phase II. The quantitative and qualitative phases of this study are discussed in detail later in this chapter.



**Figure 4.1** Visual Model for the Study Design

4.2.2 STUDY SETTINGS

The research was conducted in 15 public hospitals situated in the southern region of KSA. The MOH manage all these hospitals, which were classified as large or small hospitals based on their bed capacity. Hospitals with  $\geq 50$  beds were classified as large and those with  $\leq 49$  beds were classified as small. In addition, hospitals were further classified as accredited or not based on their health accreditation status. At the time of data collection, there were six large hospitals and nine small hospitals, of which seven were accredited and eight were not accredited.

### 4.2.3 *STUDY POPULATION*

The targeted population was any healthcare professional including nurses, doctors, physiotherapists, radiologists, pharmacists, medical laboratories staff and managers working in the 15 public hospitals in the Asir Region, KSA. Based on the salary name and list for the MOH administration, the potential target population was 4,817 healthcare providers and managers.

### 4.2.4 *INCLUSION AND EXCLUSION CRITERIA*

Some inclusion and exclusion criteria for respondents and organisations were applied to maintain the value of the research findings, which are outlined below:

#### 4.2.4.1 *Respondent Criteria*

- Respondents must have completed at least one year of work experience in the Asir Region hospitals prior to their participation in this study.
- All healthcare providers and managers were invited to participate in this study regardless of their nationality, gender, age, education level, or cultural background.

#### 4.2.4.2 *Organisational Criteria*

- All hospitals should be public hospitals
- All hospitals should be managed by MOH
- All hospitals should be located in the Asir Region of Saudi Arabia.

### 4.2.5 *ETHICAL CONSIDERATIONS*

Prior to the data collection, ethical approval was obtained from the Human Research Ethics Commute at UWA (approval number: RA/4/1/6245, see Appendix C). In addition, permission was obtained from the Saudi Health Department in the Asir Region and Kind Khalid University (see Appendix D).

Prior to data collection and interview, all participants in this study were provided with written information about the study including its aim and objectives, contact details for the researcher, student's supervisor names and contact details in case participants needed to discuss any issue concerning the study (Appendix E).

The study was anonymous, and responses were not linked to individuals. All personal data related to the participants were de-identified, and their privacy was assured at all times. In

addition, no names were sought or required from any participant, and they were informed that their participation was voluntary, and they could withdraw at any stage without any obligation. This study was classified as low risk by the University of Western Australia Human Research Ethics Committee (Approval #: RA/4/1/6245).

The collected data were stored securely at UWA. Electronic files were also saved on a computer at UWA and protected by a password. All data will be maintained and locked in a secure filing cabinet for five years and then destroyed in accordance with the UWA HREC policy.

Any findings reported in this study and/or in future publications will contain no identifiable data and the researcher will adhere to the National Statement on Ethical Conduct in Human Research by the National Health and Medical Research Council (NMRC), Australian Research Council, and Australian Chancellors' Committee.

Finally, in terms of using copyright for the data collection tools, permission was granted in 2013 with the original authors (see Appendix F).

### **4.3 SECTION 2: PHASE I. QUANTITATIVE STUDY**

#### **4.3.1 DESIGN**

The quantitative part of this study was conducted as Phase I, being a cross-sectional survey design in which a self-administrated questionnaire was used to evaluate the perception of participants towards patient safety culture in their hospitals and to identify the factors related to their perception. The cross-sectional design is the process of collecting data at a certain point in time.<sup>196</sup> The data was collected from multiple people which allows systematic comparison and aggregation of findings.<sup>199</sup> There are a number of advantages and disadvantages of the cross-sectional studies. For example, cross-sectional studies can be very cost effective as they are completed in a short period, they commonly use surveys to collect data and they do not require participants to be assigned to groups, they also can help researcher to examine a number of variables in the one study, data can be generated in short period of time and when these studies are based on a sample of the entire population, they enable results to be generalised to the whole group. However, the major limitation to a cross sectional study is that it does not allow evaluation of changes in patient safety or safety culture over time.

In general, the quantitative approach was chosen in Phase 1 for several reasons, which are summarised below.

It has been argued that quantitative research pursues the causes of social phenomena regardless of subjective matter related to the individual.<sup>200</sup> In addition, quantitative research is easy to implement, provides summarised data that supports the phenomenon under study, and preserves the confidentiality and anonymity of respondents.<sup>200</sup>

Furthermore, a quantitative survey facilitates the explanation of differences between participants in terms of their perception of patient safety culture. It also enables the evaluation of the study's problem with a consistent tool.<sup>201</sup>

In quantitative research, there is a greater chance of minimising the influence of the researcher upon the phenomena under investigation.<sup>201</sup> Finally, quantitative research can help to evaluate variables that are not usually observable and describe the characteristics of a large population.

There are some disadvantages of survey research. For example, ambiguously worded questions and low response rates are considered problems with questionnaires.<sup>199</sup> To avoid these concerns, a pilot test of the questionnaire was conducted to assess the readability before the actual data collection. In addition, a follow-up plan every two weeks after distribution of the questionnaire was implemented for six weeks to improve the response rate.

#### *4.3.2 SAMPLING AND RESPONSE RATE*

A stratified random sampling method was used to collect data from more than one discipline. This method of sampling can be described as the process of dividing the study population into smaller groups called strata.<sup>202</sup>

Using this sampling method enabled the researcher to select a representative sample of the target population, and allowed every participant an equal probability of being selected.<sup>202</sup> The targeted population was divided into groups or stratum based on their professional characteristics (i.e. doctor, nurse, manager, and allied healthcare provider). Participants were then pooled from each stratum to form one random sample. Table 4.1 shows the number of

each job position (stratum). A proportionally stratified sample technique was used to determine the sample size based on the size of the study population. The proportional stratified sample is the process whereby the proportion of each stratum in the target sample is proportionate to the size of the stratum in the study population. The number of study participants needed from each stratum was then calculated (see Table 4.1).

The random sampling method was selected to reduce selection bias and ensure that each stratum of the study population had been accurately represented. The following conditions were followed to ensure sample randomisation:

1. All job positions were clearly defined (doctor, nurse, health manager, and allied healthcare provider).
2. The sample size from each subgroup was calculated based on its representation within the population as a whole.

**Table 4.1** The Stratified Sample of all Populations

Profession	Positional number	Relative frequency	Sample size
Nurses	2,186	45.3%	450
Doctors	554	11.5%	110
Allied health	2,007	41.6%*	420
Health managers	70	1.4%*	20
Total	4,817	100%	1000

\*Rounded number

The total estimated number of the study population was 4,817 healthcare providers and managers. The sample size was calculated based on a power analysis to achieve 95% power to detect a medium effect size of  $d = .4$  using regression analysis. The revealed estimated sample size was of at least  $n = 785$ .

The effective response rate at the end of this study was 78.5% which was higher than the expected response rate. The researcher distributed 1,400 questionnaires in the 15 public

hospitals in the Asir Region, KSA. Of the 1,320 returned surveys, 1,100 were completed and used in the final analysis while 220 were excluded from the analysis. The questionnaires were excluded if they were not complete or if the participant selected one answer in all items.

#### 4.3.3 DATA COLLECTION TOOL

The Hospital Survey on Patient Safety Culture (HSOPSC) was used to evaluate patient safety culture. The HSOPSC was developed by the Agency for Healthcare Research and Quality (AHRQ), and can be applied at both hospital and unit level.<sup>10</sup> The HSOPSC is a five-point Likert scale of agreement, ranging from 1 “strongly disagree” to 5 “strongly agree” or as a scale of frequency (1=never to =5 always). It contains 42 items to evaluate 12 patient safety culture composites (eight independent variables and four dependent variables) (see Appendix A) and two-single outcome questions.<sup>10</sup> The HSOPSC evaluates the following dimensions of safety culture (Table 4.2):

**Table 4.2** Safety Culture Dimensions in the HSOPSC

No	Dimensions	Item
<b>Dimensions at Departmental Levels</b>		
1	Supervisor/Manager Expectations & Actions Promoting Patient Safety	4
2	Organisational Learning–Continuous Improvement	3
3	Feedback & Communication about Error	3
4	Non-punitive Response to Error	3
5	Communication Openness	3
6	Teamwork within Units	4
7	Staffing	4
<b>Dimensions at Hospital Levels</b>		
1	Management Support for Patient Safety	3
2	Teamwork across Units	4
3	Handoffs & Transitions	4
<b>Outcome Safety Culture Dimensions</b>		
1	Overall Perception of Patient Safety	4
2	Frequency of Events Reported	3

3	Patient Safety Grade	1
4	Number of Events Reported in the Last 12 Months	1

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Moreover, participants were requested to grade overall patient safety in their workplace on a five-point Likert scale ranging from “Excellent” to “Failing”.



The HSOPSC was selected to collect data in Phase I of the study because:

1. It has been widely used and validated in different countries around the world.
2. It helps to identify the factors affecting patient safety culture.
3. It can be used as a baseline assessment tool to evaluate the current picture of safety culture.
4. It works better with large samples from the target population of the study.
5. The HSOPSC can evaluate safety culture at the hospital level as a whole and/or unit level within the hospital.
6. It has been used to evaluate the impact of patient safety intervention and improvement over time.

#### 4.3.4 INSTRUMENT RELIABILITY AND VALIDITY

The HSOPSC was used as a data collection instrument in this study. It showed significant reliability and validity. The term reliability refers to the degree in which an assessment tool yields stable and consistent findings or always receives the same results.<sup>203</sup> The reliability measurement contains three aspects: equivalence, stability and internal consistency (homogeneity).<sup>202</sup>

The equivalence aspect indicates the level of agreement between two or more of the data collection tools when used at the same time.<sup>202</sup> In addition, the stability aspect means the similarity in findings if the tests are repeated on the same group of respondents. The internal consistency (homogeneity) aspect has been widely described in the literature but controversially defined.<sup>202</sup> It refers to *“the degree to which each rating category domain contains behaviourally similar elements (internal homogeneity), versus behaviourally dissimilar elements (internal heterogeneity)”*.<sup>202(p490)</sup> Internal consistency can be evaluated by applying the Kuder-Richardson or the split-half reliability index.

To evaluate the questionnaire reliability of this study, Cronbach’s alpha was used. It evaluates the average of the questionnaire’s items and their correlation with their scale.<sup>202</sup> It has been suggested by some researchers<sup>202,204,205</sup> that the higher the Cronbach alpha score (closer to 1.0), the more reliable findings of the study. However, they also claimed that if the reliability value was low (below 0.6) then the research findings might be unreliable.<sup>205</sup>

The validity of the HSOPSC questionnaire is evident in the literature. It had been tested and piloted among 1,419 hospital employees from 20 different hospitals in the USA.<sup>206</sup> The results revealed that the tool had a high level of reliability among all 12 dimensions (Cronbach's alpha ranged from 0.63 to 0.84).<sup>206</sup> Moreover, several studies from different countries have indicated that the HSOPSC has good psychometric properties. For example, Sorra and Dyer<sup>207</sup> examined survey data from 50,513 respondents from 2,267 units within hospitals in the USA to evaluate the psychometric properties of the HSOPSC items and composites scores. The results showed good psychometric properties at all levels of analysis among the 12 dimensions and 42 items of the HSOPSC instrument.<sup>207</sup>

In addition, the psychometric properties, reliability and validity of the Arabic version of the HSOPSC were tested by Najjar et al.<sup>208</sup> The researchers collected data from 2,022 healthcare providers and managers in 13 hospitals in Palestine. The researchers argued that the Arabic version of the HSOPSC had low internal consistency in some of the composites scales compared to the English version.<sup>208</sup> However, they concluded that the Arabic questionnaire had good validity and acceptable reliability with Cronbach alpha scores ranging from 0.41 to 0.87. The researchers concluded that the Arabic HSOPSC was an appropriate tool for evaluating patient safety culture in Arabic speaking countries.<sup>208</sup> Table 4.3 shows the Cronbach alpha scores of the original HSOPSC and the Arabic translated version.

**Table 4.3** Reliability Score of the Original HSOPSC Survey Compared to the Arabic Version

Dimensions		Items	Cronbach alpha of the original HSOPSC	Cronbach alpha of Arabic HSOPSC
1	Frequency of Event Reporting	3	0.84	0.87
2	Overall Perceptions of Safety	4	0.74	0.43
3	Supervisor/Manager Expectations & Actions Promoting Patient Safety	4	0.75	0.75
4	Organisational Learning–Continuous Improvement	3	0.76	0.79
5	Teamwork within Units	4	0.83	0.77
6	Communication Openness	3	0.72	0.41
7	Feedback about Error	3	0.78	0.69
8	Non-punitive Response to Error	3	0.79	0.59
9	Staffing	4	0.63	0.65
10	Hospital Management Support for Patient Safety	3	0.83	0.66
11	Teamwork across Units	4	0.80	0.61
12	Handoffs & Transitions	4	0.80	0.73

Sources: Sorra & Dyer<sup>207</sup> & Najjar et al.<sup>208</sup>

#### 4.3.5 TOOL TRANSLATION AND VALIDATION

While English is the formal language in MOH hospitals in Saudi Arabia, the HSOPSC questionnaire was contextualised and translated into the Arabic language to meet the multicultural environment of the workforce in the Asir Region. The tool went through a rigorous translation and validation process. Both languages were incorporated into a single form to accommodate the study population and convey a sense of cultural understanding to the participants. However, one of the most common deficits in using questionnaires usually lies in the translation into different languages.<sup>209</sup> To avoid this, the translation process adopted the WHO<sup>210</sup> method in the translation of the questionnaire or data collection instrument. The three translation steps that were used are explained below.

Step 1 involved **Forward Translation**. At this stage, an independent professional translator translated the HSOPSC questionnaire from English to Arabic for the first time. The newly

translated questionnaire was examined for cultural equivalency. The translator spoke both languages (English and Arabic) fluently, and his mother tongue was Arabic.

Step 2 involved the formation and consultation of **Expert Panel and Cognitive Interviewing**. In this step, a bilingual expert panel was invited to revise the first draft of the translated questionnaire in Step 1. The panel consisted of four members including the researcher and three healthcare professionals. The expert panel met on a regular basis on three occasions to review and evaluate the questionnaire development process. In each meeting, the panel examined all sections of the questionnaire to identify and resolve unclear questions. In the first meeting, the panel highlighted some concerns about the translation and provided recommendations. The panel met again and evaluated the modified questionnaire. In addition, they compared it to the original English version. The panel examined the questionnaire for its clarity and accuracy in terms of the words and sentences. The expert panel approved the final draft of the Arabic version of the questionnaire.

Step 3 involved the **Assessment of Content Validity** of the translated questionnaire. This is a crucial method for evaluating the quality of the scale. The content validity index (CVI) was used to calculate the relevance of the translated items as recommended by Lynn.<sup>211</sup> To do this, the researcher contacted six healthcare professionals and managers (one doctor, one registered nurse, two health managers and three academic researchers from King Khalid University) to establish another expert panel and compute the relevance of the translated items. All items in the scale were examined to test their representation of each dimension. The panel deemed that the content validity of the questionnaire was appropriate for this study and no comments were suggested.

In addition to the above steps, an independent translator back-translated the Arabic questionnaire into English. The back-translated draft was then compared with the original English version of the questionnaire to find any discrepancies. However, both versions had remarkable similarity with no further modification being required (Appendix A).

#### 4.3.6 PILOT STUDY

A pilot study was conducted to examine the validity and clarity of the translated questionnaire.<sup>212</sup> In addition, it aimed to identify any procedural problems during the distribution and collection of questionnaires in the targeted hospitals. One hospital in Abha was randomly selected to undertake the pilot study. This hospital was excluded from the current study to eliminate compromising the validity of the results.

Before the pilot study, posters were placed inside the hospital to recruit participants. In total, 50 questionnaires were distributed to healthcare professionals and managers. After two weeks, 33 questionnaires had been returned (66% response rate). All questionnaires were examined for their completeness. On average, participants completed the questionnaire in about 20–25 minutes. The participants were requested to write any suggestions or comments about the clarity of the questionnaire. No comments or feedback were received about the questionnaire. All data from questionnaires were analysed using the Statistical Package for Social Service (SPSS) Version 20. The questionnaire reliability was evaluated and showed significant results in all dimensions of the scale. In addition, the split-half reliability test was conducted and showed an average inter-item correlation of at least 0.770 which is regarded as acceptable.<sup>213</sup> The results of the pilot study confirmed the data collection tool to be reliable and suitable for use in this study.

#### 4.3.7 DATA COLLECTION

Healthcare professionals and managers were recruited from 15 public hospitals in the Asir Region, KSA to participate in this study. Prior to accessing the study sites, permission was obtained from the General Directorate of Health Affairs in the Asir Region (see Appendix D) to facilitate this study. In addition, the researcher held several meetings with the hospitals and nursing directors at each site to explain the aim of the study and seek their support during data collection. The researcher hand-delivered surveys to healthcare professionals and managers with an information letter and instruction sheet on where and how to return the completed survey and provided return envelopes.

A follow-up plan was made with each hospital to improve the response rate. The researcher contacted the heads of departments at two, four, and six weeks to ascertain if any questionnaires had been submitted. Small collection boxes were placed in the secretary's

office of each department. These boxes were collected-back several weeks after the initial distribution.

All questionnaires were printed on paper and distributed manually rather than an online survey to avoid any barriers such as the lack of the internet services in some remote hospitals.

#### 4.3.8 DATA CODING AND CLEANING

All returned questionnaires were examined to check their completeness. Any uncompleted questionnaires were excluded. In addition, each returned questionnaire was given a unique identification number prior to the data entry process. All questionnaire responses were coded numerically and entered into SPSS v.20 software. SPSS v.20 was used to check and clean the quantitative data of coding errors or any typographical errors or inconsistencies with single and multiple field frequency analyses. Subsequently, to check the accuracy of data entry, 5% of the cases were selected randomly and compared to the original questionnaire responses and showed no differences.<sup>214</sup>

The assumption of normality was not of great importance in this study due to the large sample size ( $n = 1100$ ). Many researchers argue that the violation of normality assumption with a large enough sample size, *“often do not noticeably impact results”*.<sup>215(p1),216-218</sup> It was evaluated graphically with histogram and normal plots using explore analysis in SPSS v.20. In addition, the normal probability plots were examined visually. No clear sign of skewness was observed with the presence of a cluster around a straight line. Therefore, the sample was considered approximately normally distributed.<sup>219</sup>

The sample was also scanned for any missing values. There were few cases with missing values. Two steps were taken to maintain the accuracy of data analysis. Firstly, missing values were replaced with a zero when calculating composite scores. Secondly, as the multivariate analysis could not be conducted with missing values, missing values were imputed with mean scores using SPSS v.20 software (using the Transform - Replace Missing Value option). The missing values were not in a systematic pattern, thus imputation with mean scores was not considered to bias the findings.<sup>220,221</sup>

The sample was also checked for outliers. Outliers were any cases with standardised residual values of  $\pm 3.3$ . However, Pallant<sup>216</sup> emphasises that it is not common with large sample sizes to detect a few outlying residual values that need intervention. Across all cases, only one was

observed as an outlier (case #478, Std. residual = 3.38). However, no further action was considered.

#### 4.3.9 DATA MANAGEMENT AND CONSIDERATION TO IMPROVE ANALYSIS

The SPSS v.20 software was used to manage the quantitative data. In addition, some consideration was given to improving the data analysis process, which are discussed in the subsequent paragraphs.

The dimensions of safety culture extracted from the HSOPSC questionnaire contain 42 items to construct 12 patient safety dimensions. The questionnaire dimensions were operationalised by adding up the scores for the items that constituted each dimension. All data were numerically coded (operationalised) for statistical analysis.<sup>222</sup> Participants' demographic characteristics and hospital characteristics were numerically labelled, collapsed and categorised. Table 4.4 shows the new categories of variables.

In the initial data, the age of respondents was collected according to exact age in years before being categorised into four groups. However, for the regression analysis, the continuous variable of age was used.

The educational levels were initially collated into five categories: Postgraduate Degree, Bachelor's Degree, College Degree, Health Institute Degree, Other Degree. For analysis, the last three categories were collapsed into one category: Diploma Degree or less (n = 384, 34.9%). For the regression analysis, the education level was dichotomised into two groups: Bachelor's Degree or higher, and Diploma Degree or lower.

The variables of professional tenure and hospital tenure were divided into three categories for each variable including  $\leq 5$  years, 6 to 10 years, and  $\geq 11$  years.

The monthly income variable was divided into three categories:  $\leq 5,000$  SAR, 5,001 to 10,000 and  $\geq 10,001$  SAR.

The *Patient Safety Grade* variable was collected during the initial data collection in five categories: Excellent, Very Good, Acceptable, Poor, and Failing. For regression analysis, this variable was dichotomised into two categories as (0) Poor/Failing and (1) Good/Acceptable.

Likewise, the *Number of Events Reported in the Last 12 Months* was collected in six categories: No event reported, 1 to 2 event reports, 3 to 5 events reports, 6 to 10 events reports, 11 to

20 events reports, and 21 or more event reports. For regression analysis, this variable was collapsed into two categories: (0) No event reported in the last 12 months, and (1)  $\geq 1$  event reported in the last 12 months.

The variable *Number of Working Hours per Week* was initially collected in six categories as less than 20 h/week, 21 to 39 h/week, 40 to 59 h/week, 60 to 79 h/week, 80 to 99 h/week, and 100 h/week or more. Then it was collapsed into three categories as  $\leq 20$  h/week, 20 to 39 h/week, and  $\geq 40$  h/week.

**Table 4.4** Operationalisation of Participants and Hospital Variables

Characteristics	Category	Numerical code
Gender	Female	0
	Male	1
Nationality	Other nationality	0
	Saudi	1
Language	English	0
	Arabic	1
Staff position	Doctor	1
	Nurse	2
	Hospital management	3
	Unit management	4
	Other	5
Age group	20 to 29	1
	30 to 39	2
	40 to 49	3
	50 or more	4
Working hours	Less than 20 h/week	1
	20 to 39 h/week	2
	40 or more h/week	3
Education level	Postgraduate degree	1
	University degree	2
	College degree	3
	Institute degree	4
	Diploma	5



Characteristics	Category	Numerical code
Profession years	5 years or less	1
	6 to 10 years	2
	11 years or more	3
Hospital years	5 years or less	1
	6 to 10 years	2
	11 years or more	3
Patient contact	No	0
	Yes	1
Hospital size	Small	0
	Large	1
Hospital accreditation	Not accredited	0
	Accredited	1
Error reporting system/method	Yes	1
	No	2
	Don't know	3

#### 4.3.10 DATA ANALYSIS

A descriptive and inferential statistical analysis was conducted to address the research objectives listed in Table 4.5. The analysis was based on the responses to the questionnaire (see Appendix A) using the variables listed in Tables 4.6 and 4.7.

**Table 4.5** Research Objectives

Research Objectives
1. Evaluate how healthcare providers and managers perceive patient safety culture.
2. Evaluate the awareness of healthcare providers and managers about the methods of AE reporting in their hospitals
3. Determine the differences in the dimensions of patient safety culture between accredited and non-accredited hospitals
4. Investigate any significant relationships between the variables of participant and hospital characteristics (gender, age, education, language, nationality, working hours, direct contact with patient, professional tenure, organisational tenure, hospital size, and hospital accreditation) and the four outcomes dimensions of patient safety culture

5. Estimate the capacity of the demographic and hospital characteristics in predicting the positive perception of patient safety culture dimensions
6. Present recommendations for healthcare managers and leaders on strategies to improve patient safety culture among healthcare providers in public hospitals

**Table 4.6** Latent Variables

No.	Latent Variable	Abbreviation
1	Overall Perception of Safety	OPPS
2	Frequency of Events Reported	FER
3	Teamwork within Units	TWU
4	Supervisor/Manager Expectations & Actions Promoting Patient Safety	ME&APPS
5	Organisational Learning–Continuous Improvement	OLCI
6	Management Support for Patient Safety	MSPS
7	Feedback & Communication about Error	FCAB
8	Communication Openness	CO
9	Teamwork across Units	TAU
10	Staffing	ST
11	Handoffs & Transitions	HT
12	Non-punitive Response to Error	NPRTE

**Table 4.7** Participant Characteristics

No.	Participant Characteristics
1	Gender
2	Staff Position
3	Age Group (Years)
4	Nationality
5	Language
6	Educational Level
7	Awareness of Error Reporting Policy/Method
8	Marital Status
9	Years in Same Hospital
10	Years in Profession
11	Hours Worked per Week
12	Patient Contact
13	Hospital Size
14	Hospital accreditation status

#### 4.3.10.1 Operationalisation of Latent Variables

Confirmatory factor analysis was used to analyse the factorial structure of the questionnaire items using SPSS v.20. Twelve factors (latent variables) were extracted. Factorial validity was established by (a) factor loadings  $\geq 0.5$  for all of the items that contributed to each latent variable; (b) the variance explained in each factor was  $\geq 50\%$ , and (c) the eigenvalues for each factor were  $> 1.0$ . Good internal consistency reliability was indicated by Cronbach's alpha  $> .6$ .<sup>223</sup>

#### 4.3.10.2 Descriptive and Inferential Statistics

The quantitative analysis was performed using SPSS v.20 and the AHRQ guidelines.<sup>10</sup> The AHRQ analysis guidelines indicate that the highest response categories for a positively worded item can be combined (such as "strongly agree" and "agree", or "most of the time" and "always"). Similarly, the lowest response categories for reverse worded items can be combined (such as "strongly disagree" and "disagree" and "never" and "rarely"). The score for each item and dimension were calculated and reported in frequencies. According to the AHRQ, higher scores indicate positive perceptions of patient safety culture. In terms of evolution, the AHRQ categorised the culture of patient safety into two categories. Firstly, any dimensions (or item) with a positive response rate of a 75% or more are "areas of strength" in patient safety culture. Secondly, any dimensions (or items) with 50% or less positive responses are considered areas that "require improvement" in patient safety culture.

In addition, descriptive and inferential statistics were computed using IBM SPSS v.20 using the protocols described by Field.<sup>223</sup> The frequencies distributions (counts and percentages) of the categorical characteristics of the participants were tabulated.

To address Research Objective 1, descriptive statistics (mean scores  $\pm$  95 confidence intervals) were computed.

To address Research Objective 2, frequency distributions were computed to determine the awareness of error reporting system/method.

To address Research Objective 3, the positive responses to the HSOPSC were compared between accredited and non-accredited hospitals to detect any differences. Cross-tabulation and chi-square tests were used to compare differences in the frequency of events reported in the last 12 months and patient safety grades based on the hospital's accreditation status.

To address Research Objective 4, Cramer's  $V$  coefficients were computed to evaluate the correlations between categorical variables. The conventional interpretation was that  $V < 0.2$  indicated little, if any, correlation;  $V = 0.2$  to  $0.3$  indicated weak correlation;  $V = 0.3$  to  $0.5$  indicated moderately strong correlation and  $V > 0.5$  indicated strong correlation. The advantage of Cramer's  $V$  is that it factors out the sample size, so it does not automatically increase in magnitude when the sample size is large. Analysis of Variance (ANOVA) was used to compare the mean scores for perceptions on patient safety culture (the dependent variable measured at the scale/interval level) with respect to hospital characteristics (measured at the nominal/ordinal level). The results were declared statistically significant at  $\alpha = 0.05$  if  $p \leq 0.05$  for the  $F$ -test statistics. SPSS v.20 computed the effect sizes for each independent variable in ANOVA or one-sample  $t$ -test in the form of Partial Eta Squared statistics.<sup>217</sup> It is essential to measure and interpret effect sizes when conducting ANOVA.<sup>224</sup> The reasons for determining effect sizes are that, unlike  $p$ -values, effect sizes are not a function of the sample size. The  $p$ -value only determines whether the data deviate from randomness, and usually decreases when the sample size increases. In contrast, effect sizes are stable values that do not increase or decrease in relation to sample size. Effect sizes also permit evaluation of practical significance (i.e., the strengths of the relationships between the variables, indicating the meaningfulness or the results). The interpretation of effect sizes for ANOVA and one-sample  $t$ -test were as follows: 0.04 is "the minimum effect size representing a practically significant effect for social science data", whereas 0.5 represents a "moderate effect", and 0.64 represents a "strong effect".<sup>223</sup> The ANOVA assumption that the variances are homogeneous was supported when  $p > 0.05$  using Levene's test.<sup>217</sup> In addition, post hoc tests were used to compare the means of two or more groups or levels in the independent variable.

To address Research Objective 5, a matrix of Pearson's  $r$  bivariate correlation coefficients was computed as a preliminary stage. Bivariate correlation coefficients only measure the direction and strength of the relationship between two variables on a standardised scale ranging from  $-1$  to  $+1$ . The binary logistic regression was conducted with two categorical outcomes variables (*Patient Safety Grade* and *Number of Events Reported in the Last 12 Months*). The multiple regression analyses were used to explain the effects of more than one independent variable on one continuous dependent variable.<sup>225</sup> More specifically, a multiple regression analysis was used to examine: (a) how a set of variables can predict a particular dependent

continuous variable, and (b) in a set of variables, what are the significant predictors of the dependent variable.<sup>225,226</sup> The multiple regression assumptions were checked before interpreting the output of the analysis. These assumptions were outliers, multicollinearity, normality, homoscedasticity, linearity, case ratio to the independent variables, and independence of residuals.<sup>219,227</sup>

#### **4.4 SECTION 3: PHASE II. QUALITATIVE STUDY**

##### **4.4.1 INTRODUCTION**

This section discusses the qualitative method used in Phase II of this study. Qualitative data were collected through semi-structured face-to-face interviews. Combining quantitative and qualitative methods to collect data allows deeper and broader understanding of the problem related to patient safety culture than only one approach.<sup>228</sup>

Qualitative research is interpretive, focusing on context by using different methods in a humane way.<sup>229</sup> It aims to uncover the actual causes of a social phenomenon that affects human interactions and behaviours.<sup>230</sup> It can be used when a researcher is *“interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences”*.<sup>231(p5)</sup> Qualitative research is defined by Schensul<sup>232</sup> as *“the tools qualitative researchers use to investigate their research topic and construct their argument and the decisions they make as to how to use those tools and with whom”*.<sup>232(p85)</sup> In qualitative research, the researcher is considered the primary tool or instrument to collect data.<sup>230,233</sup> Therefore, the role the researcher in qualitative research is very important. However, to avoid the subjectivity in qualitative research, the concept of trustworthiness needs to be established.<sup>234,235</sup> The interview questions were extracted from the findings of Phase I.

This section starts by explaining the recruitment methods of participants, data collection process, data analysing and the methods followed to validate qualitative data.

##### **4.4.2 SAMPLING, RECRUITMENT OF PARTICIPANTS AND DATA COLLECTION**

A purposive non-probability sampling method was adopted to recruit participants to participate in this study. The purposive sampling technique enables the researcher to choose participants purposely, to serve the aim of the research,<sup>192</sup> represent the different groups of healthcare providers and managers, and maintain even distribution of participants according

to the size and location of hospitals.<sup>192</sup> The aim of this part of the study was to ascertain the findings from Phase I to clearly understand the factors affecting the culture of patient safety in public hospitals in KSA. According to Patton,<sup>236</sup> the power of purposeful sampling lies in the selecting of information-rich cases for the study.

There was only one inclusion criterion to improve the quality of qualitative data. Participants should have had at least one year of work experience in their workplace and their professional position prior to the interview. Recruiting participants from different nationalities and job categories was planned to add more insight and understanding about the effect of background on patient safety practices. All recruited interviewees were deliberately selected from Phase I of the study to gain more insight and explanation of the results from Phase I.<sup>192</sup>

The data were collected in semi-structured interviews from 30 healthcare providers and managers. This method is a common way to collect data for qualitative research.<sup>237</sup> It was selected because it is flexible and has the capacity to select cases that can provide in-depth details about the study topic. In addition, researchers can gather more detail on the feelings, experiences and views of participants.<sup>238</sup> The interview method is an opportunity for each participant to explain their perspectives on a range of topics and share stories and experiences.<sup>239</sup> More details on participant characteristics are in the qualitative results section in Chapter 6.

After obtaining data collection approval from the General Directorate of Health Affairs in the Asir Region, the head of each hospital was contacted to support the recruitment process. Several meetings were conducted with healthcare providers and managers to provide an overview of the study and encourage participation. The purpose and nature of the study were explained, and the contact details of the researcher distributed to potential candidates. After the meetings, the researcher made himself available for any inquiries, clarifications and discussion for the remainder of the day in the allocated hospital.

#### *4.4.3 QUALITATIVE PILOT STUDY*

A pilot study was conducted with four healthcare providers and managers in one hospital in the Asir Region. Participants were selected randomly from the employee list. This allowed the researcher to identify any difficulties during the interview process. Minor changes were made mainly in the language of the questions. These participants were not included in the final

qualitative interview and data collection. The average time for each interview was around 15 minutes for each participant.

#### 4.4.4 *INTERVIEW SCHEDULE*

As mentioned earlier, several meetings were conducted in each hospital to organise the interview time with the selected participants based on their availability. The interview schedule was developed to guide the interview process and time. Before the interview, a meeting plan was developed and sent to all potential participants. Some modifications and changes were made due to the nature of each participant's job and their availability to meet.

#### 4.4.5 *INTERVIEW PROCESS*

From January to March 2015, interviews were conducted with 30 participants in 15 public hospitals. The interviews ranged from 10 to 350 minutes. Of the 30 interviews, nine were conducted in English and 21 in Arabic. At the beginning of each interview, the participant was provided with a detailed letter about the research including the purpose and aim of the study, their right not to participate or to withdraw at any time. As well, the researcher initiated a general conversation to build rapport and encourage the interviewee to share experiences and knowledge.

The face-to-face interviews were conducted on an individual basis. The interviews were conducted in Arabic or English according to the participant's preference. The choice of language provided the opportunity for participants to communicate effectively and minimise the possibility of misunderstanding due to language differences. With the permission of participants, interviews were recorded on a digital voice recorder.

Before the interview, the digital voice recorder was checked in terms of its battery charge and functionality to avoid unnecessary interruption of the interview or loss of data. No personal details were asked, nor the name or the job number. The interview contained 22 open-ended questions based on the findings from the first part of this study. All interviews were recorded in a private office in each hospital with the support of hospital management.

The interview started with the researcher introducing himself and the study aim. He then moved to the consent form, reading and explaining its content to make sure that the respondents understood the consent form and agreed to participate. The consent form was signed and retained by the researcher.

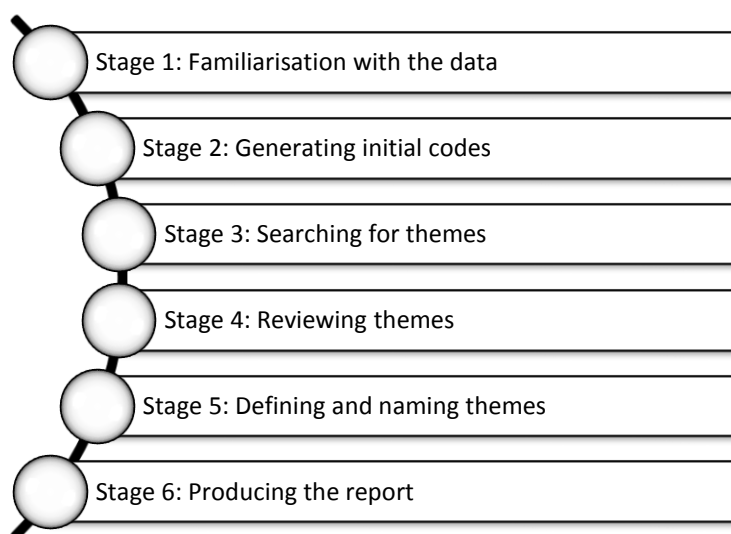
Where necessary, the researcher repeated some participants' answers to confirm and understand their meaning accurately. At the end of each interview, the researcher asked some background questions about participants such as speciality, qualifications, years of work experience and nationality. Finally, the researcher recapped the main issues discussed to confirm his understanding of the participant's perception. The participants were thanked for their participation.

#### 4.4.6 QUALITATIVE DATA ANALYSIS

The purpose of the qualitative data analysis was to gain insight into how the participants perceived, explained, and understood the results from Phase I. The sequential mixed analyses include the examination of one data type from another.<sup>198</sup>

Before recording the interviews, participants were given ID codes to maintain their anonymity. In addition, all hospitals and professions were given codes (such as 1 for nurses or hospital number 1). No names were used in the data analysis process. All audio data were transcribed and subjected to data analysis.

There are different methods for analysing qualitative data. In this study, the researcher adopted the inductive thematic method. This technique uses data to generate codes and drive thematic analysis. This method is a common method of qualitative data analysis, which can facilitate theme identification without prior assumptions.<sup>240,241</sup> Thematic analysis was conducted in a systematic process in six stages as shown in Figure 4.2.



**Figure 4.2** Theme Development Stages



In Stage 1, the data was examined thoroughly by listening to the recorded interviews many times to gain more understanding and familiarity of the data. After that, the data was transcribed and compared to the audio files to check the accuracy of the transcription. All Arabic interviews were translated into English and then transcribed. While it was hard to listen, transcribe and translate the interviews, it enabled the researcher to become more familiar with the data. After the completion of the translation process, 20% of the translated and transcribed interviews were given to an independent translator to check the accuracy of the translation. A few changes were recommended, mainly related to the local Arabic language in KSA.

In Stage 2, the codes were produced from the raw data. To produce codes, the researcher read and re-read the transcribed text several times. All text segments related to the findings in Phase I were coded and grouped. The QSR-NVivo version 21 software was used to facilitate the coding process.

Stage 3 analysed all the codes identified in Stage 2 and combined them into potential themes. There were some codes with insufficient supporting evidence to generate additional themes. Similarly, few codes did not fit into any defined themes and had inadequate supporting evidence. The researcher concluded that they were essential for understanding the inferences in Part 1 of this research. Therefore, they were retained in the data analysis and interpretation. With the help of QSR-NVivo version 21 software, mind maps were used to visualise codes and sort them into themes.

Stage 4 revised the themes to identify any modifications or rejections. Braun and Clark<sup>242</sup> recommend conducting two reviews for all themes that emerge. The first review evaluates the relevance of the extracted data to its theme and finds any coherent patterns. The second review involves re-reading the transcribed data and the codes to detect any missed codes that could be aligned to the themes. At the end of this process, the final thematic map was created, and some themes were collapsed into one theme.

Stage 5 defined and named the generated themes. The themes were also examined to highlight any relationships with inference to Phase I of this study.

Stage 6 produced the study report. All themes and sub-themes were supported by relevant comments from participants, and any repeated and incomplete statements were deleted.

Grammatical errors were corrected to provide a readable text without manipulating the intended meaning.

The translation of interviews from one language into another “*is essentially a boundary crossing between two cultures*”.<sup>243</sup> For instance, the same words might have different meanings to people from different cultures. The cultural factor is important and should be recognised in the translation process.<sup>244</sup> Thus, during the translation process, the researcher maintained the exact meaning of words to reflect the original meaning as intended by the interviewee.

Phase II of the research aimed to understand the invisible factors that affect the culture of safety as perceived by the study participants. Table 4.8 shows the qualitative interview questions.

**Table 4.8** Qualitative Interview Questions

No.	Dimensions	Questions
1	Teamwork within Units	<ul style="list-style-type: none"> <li>• How do you describe your experiences with teamwork in your work area? When you are busy &amp; need support in your work unit, do you find others supportive?</li> </ul>
2	Manager Support	<ul style="list-style-type: none"> <li>• Do managers &amp; supervisors in your hospital appreciate your job when performed according to patient safety procedures?</li> <li>• Do managers consider staff suggestions about patient safety?</li> <li>• Do managers sometimes overlook any patient safety issues?</li> <li>• Do you think hospital management is interested in patient safety?</li> </ul>
3	Learning and Improvement	<ul style="list-style-type: none"> <li>• Do you think that changes in patient care are based on report of AEs?</li> <li>• Do you evaluate any changes related to patient safety?</li> </ul>
4	Perception of Patient Safety	<ul style="list-style-type: none"> <li>• Do you think the procedures and systems in your workplace are effective at preventing errors from happening?</li> <li>• Do you have any patient safety problems in your unit?</li> <li>• Do you (yourself) sometimes overlook patient safety to get more work done?</li> </ul>
5	Feedback & Communication	<ul style="list-style-type: none"> <li>• Have you ever received any feedback about errors in your unit?</li> <li>• Do you discuss ways to prevent errors from happening again?</li> </ul>

No.	Dimensions	Questions
		<ul style="list-style-type: none"> <li>• Do you discuss ways to prevent errors from happening again?</li> </ul>
6	Error Reporting	<ul style="list-style-type: none"> <li>• Do you have systematic methods to report errors?</li> <li>• Do you think people report all types of errors that happened in your units?</li> </ul>
7	Teamwork across Units	<ul style="list-style-type: none"> <li>• From your own experience, how do you describe your experience working with other units in terms of cooperation and coordination?</li> </ul>
8	Staffing	<ul style="list-style-type: none"> <li>• Is there enough staff in your unit?</li> <li>• Do you think that the length of hours you work impacts patient safety or quality of care?</li> </ul>
9	Handoffs & Transitions	<ul style="list-style-type: none"> <li>• Do you think that important patient care information is lost during handoffs &amp;/or patient transfer from one unit to another?</li> </ul>
10	Just Culture	<ul style="list-style-type: none"> <li>• Do you feel that your mistakes are held against you or kept in your file records?</li> <li>• Do they look at the reasons of problem or error and fix it or they punish the staff?</li> </ul>
11	Demographic Data and its Relationship with Reporting Errors	<ul style="list-style-type: none"> <li>• Do you think that there is a relationship between healthcare providers' gender, language, nationality, education level, working hours, direct contact with patient and the frequency of reporting errors?</li> </ul>

#### 4.4.7 QUALITATIVE DATA VALIDATION

Qualitative data can be validated with numerous techniques.<sup>245</sup> In this study, the validity of the qualitative data was established using the purposive sampling method. This method allowed the researcher to improve the quality of data by selecting the individuals who would provide rich information about the study problem. All participants were provided with a summary of the interview “member checks” which helped to validate the data.<sup>246</sup> This technique enabled participants to review their answers and correct any misinterpretations or misunderstandings. In addition, peer debriefing was used to maintain the qualitative data validity. According to Lincoln and Guba,<sup>247</sup> peer debriefing can enhance the overall trustworthiness of the findings. In this study, peer debriefing was achieved through discussion with the study’s supervisors who had experience in qualitative research.

#### 4.4.8 TRUSTWORTHINESS

In qualitative research, there are four elements of trustworthiness, as discussed by Lincoln and Guba.<sup>235</sup> Despite criticism of the four elements, they are still recognised as the main principles related to trustworthiness in qualitative research. The application of these elements to the current study are discussed below.

##### 4.4.8.1 Credibility

Credibility in qualitative research refers to the level of confidence and trustfulness in the findings and interpretations of the collected data.<sup>235</sup> Trustfulness is gained when interviewees describe their lived feelings and experiences towards any problem. It is important that the descriptions of the lived feelings and experiences are perceived similarly and recognised by others who shared similar experiences.<sup>248</sup> Credibility is assumed as one of the most critical principles in the assessment of qualitative research.<sup>249</sup> The important assumption of credibility is based on the existence of many realities that require being represented exactly as revealed by the participants.<sup>235</sup>

It was taken into consideration by the researcher to present credible findings. Therefore, the data collection planning and sampling method were based on this assumption. Participants were allowed to share their lived experiences towards patient safety culture as perceived. In addition, the researcher adopted the following two techniques to maintain credibility:

1. Analyst triangulation: the researcher's supervisors have reviewed the findings of the qualitative results. This helped to illuminate blind spots in the interpretive analysis and improve the qualitative research outcomes.
2. Member-checking: this technique will share findings with the interviewees. It helped the participants to clarify their thoughts and ideas, and provide additional information, if needed.

##### 4.4.8.2 Transferability

Transferability means the ability to extend or generalise research findings to wider groups or contexts<sup>235</sup>. To establish transferability in qualitative studies, Lincoln and Guba recommended to provide "thick description".<sup>235</sup> Thick description is a technique in which the qualitative

researcher provides a detailed collection experience of the research settings and interview process.<sup>235</sup>

To fulfil this assumption, the researcher provided details of the sampling process, interview process and location of data collection settings. This will help the reader to apply the findings to similar settings and make the research findings transferable. In addition, the description of the cultural and social contexts that surrounded the data collection will help the reader to understand the study context from the participants' answers. This enables other researchers and readers to make the transferability and judgements through their understanding of the research context and settings.<sup>250</sup>

#### *4.4.8.3 Dependability*

The term dependability indicates the stability of the research results over time. To ensure dependability, an interview protocol was followed. For example, the data were digitised, recorded, transcribed, and audited by another investigator.

Throughout the research process, the researcher's supervisors acted as auditors and provided important comments that maintained and improved the dependability of the research. In addition, the steps taken throughout the data collection, transcription, analysis and interpretation of the results are documented in detail. The findings will be examined and supported by direct quote to confirm the accuracy of the results.

#### *4.4.8.4 Conformability*

Conformability indicates the reflective analysis of the methods adopted by the researcher to collect qualitative data.<sup>235</sup> Conformability aims to eliminate researcher bias and increase confidence in the findings. To ensure conformability of the Phase II findings, a number of steps were employed including:

- The researcher's supervisors provided critical reflective comments about the research process
- Adequate description of the data collection process is presented
- All voice-recorded data has been inspected thoroughly and compared to the transcribed data
- NVivo software was used to store and analyse the transcribed data, and link the themes with their sub-themes and nodes

- Explanatory letter and consent form were provided to each participant (Appendix E).

#### **4.5 SUMMARY**

This chapter detailed the research methodology used to complete this study. It was organised into three sections. Section 1 presented an overview of the study and showed the phenomenological research paradigms adopted in the two phases of data collection. It also detailed the study settings, population, inclusion criteria and ethical considerations.

Section 2 discussed the quantitative phase (Phase I) of the study. It detailed the quantitative research design, data collection tool, instrument, reliability and validity of the data collection tool, tool translation process, pilot study, sampling, data collection, response rate and data analysis.

Section 3 discussed the qualitative phase (Phase II) of the study and described the qualitative approach, sampling, data collection methods and procedure, interview process, qualitative data analysis and rigour.

The next two chapters present the research findings from the two phases of the study and highlight the factors affecting patient safety culture in 15 public hospitals in the Asir Region, KSA.

## CHAPTER 5. QUANTITATIVE PHASE RESULTS

### 5.1 INTRODUCTION

This chapter addresses the quantitative results of this study. It starts by describing the profiles of the participants and hospitals followed by an overview of the positive response on the HSOPSC questionnaire. Further results are presented at the item level of the HSOPSC questionnaire.

The chapter is guided by the research objectives as follows:

1. Evaluate how healthcare providers and managers perceive patient safety culture.
2. Evaluate the awareness of healthcare providers and managers on the methods of AE reporting in their hospitals.
3. Determine any differences in the dimensions of patient safety culture based on the health accreditation status of hospitals.
4. Investigate any significant relationships between the participant and hospital characteristics variables (gender, age, education, language, nationality, working hours, direct contact with patient, professional tenure, organisational tenure, hospital size, and hospital accreditation) and the two selected outcome variables (overall perception of patient safety and frequency of events reported).
5. Estimate the capacity of the demographic and hospital characteristics in predicting the positive perception of patient safety culture dimensions.
6. Present recommendations for healthcare managers and leaders on strategies to improve patient safety culture among healthcare providers in public hospitals.

### 5.2 OVERVIEW OF THE SAMPLE PROFILE

A total of 1,100 participants completed the HSOPSC questionnaire. Table 5.1 summarises the self-reported characteristics of who worked at the 15 public hospitals. More than half the participants were nurses ( $n = 600$ , 54.5%) and more than one-half were female ( $n = 645$ , 58.6%). Around one-fifth were doctors ( $n = 219$ , 19.9%), with relatively few unit or hospital managers ( $n = 91$ , 8.2%).

Most of the participants came from countries such as India, Philippines, Egypt, Syria, Sudan and Pakistan ( $n = 629$ , 57.2%); about one-half of the participants ( $n = 546$ , 49.6%) spoke English while the remainder spoke Arabic. Nearly all participants were qualified with Postgraduate, University, College, or Institute degrees ( $n = 986$ , 89.7%), and the most common qualification was a Bachelor's degree ( $n = 456$ , 41.5%).

**Table 5.1** Participant Characteristics

Level	Count ( $N=1100$ )	%
<b>Staff position</b>	<b><math>n = 1088</math></b>	
Doctor	219	20
Nurse	600	54
Hospital Management	50	4
Unit Management	41	4
Other	178	16
<b>Gender</b>	<b><math>n = 1059</math></b>	
Male	414	38
Female	645	59
<b>Nationality</b>	<b><math>n = 1072</math></b>	
Saudi	443	40
other	629	57
<b>Language</b>	<b><math>n = 1067</math></b>	
Arabic	521	47
English	546	50
<b>Education</b>	<b><math>n = 1053</math></b>	
Postgraduate Degree	213	19
Bachelor's Degree	456	41
College Degree	223	20
Institute Degree	94	8
Other	67	6

The participants' experience ranged from <5 to >20 years, with the majority having worked for  $\geq 10$  years ( $n = 812$ , 76%) and relatively few for 21 years or more ( $n = 75$ , 7%). Interestingly, while many participants indicated that they had more than 6 years' experience ( $n = 739$ , 67.2%), most emphasised that they had spent  $\leq 5$  years ( $n = 528$ , 31%) at their current hospital



at the time of data collection. In general, participants tended to have more years of experience in their profession than tenure in their hospital. In addition, participants worked from <20 to  $\geq 100$  hours per week, but most worked for 40 to 59 hours per week ( $n = 873$ , 79.4%). Table 5.2 shows more detail on work experience and working hours per week.

**Table 5.2** Participants' Work Experience and Working Hours per Week

Time worked in the hospital (years)	n	%	Typical time worked (hours per week)		
			N	%	
Less than 5 years	528	49%	Less than 20 hours	18	2%
6 to 10 years	284	27%	20–39 hours	48	4%
11 to 15 years	77	7%	40–59 hours	873	81%
16 to 20 years	104	10%	60–79 hours	65	6%
21 years or more	75	7%	80–99 hours	43	4%
			100 hours or more	31	3%

Approximately two-thirds of the participants worked in hospitals classified as “large” ( $n = 702$ ), while the remainder worked in “small” hospitals ( $n = 398$ ). Seven hospitals had an accreditation status at the time of data collection while eight did not.

The age of respondents ranged from 20 to 65 years. Nearly 47.1% and 24.3% were in the 26–35 and 36–45 age-groups, respectively. These two age-groups collectively accounted for almost three-quarters (71.4%) of the total sample, indicating that most of the public hospital workforce is young (i.e. <40 years of age). The mean age of the sample was 34 years, with a standard deviation of 8.67. Figure 5.1 illustrates the age distribution of the participants.

Participants were requested to indicate their direct interaction with patients in their workplace. The results showed that most of the respondents ( $n = 863$ , 81%) had direct contact with patients.

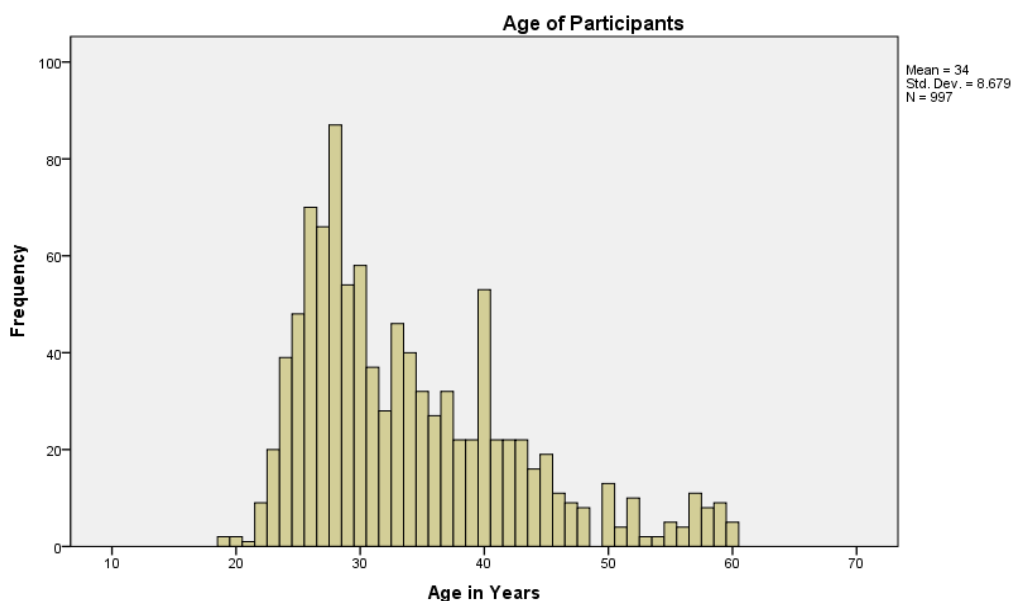


Figure 5.1 Age of Participants

### 5.3 SURVEY FINDINGS

#### 5.3.1 OVERALL RESPONSE TO EACH DIMENSION OF PATIENT SAFETY CULTURE

Descriptive analysis and the AHRQ Hospital Survey Excel Tool v.2 were used to analyse scale responses and calculate the percentage of positive responses to determine the areas of strength. The results ranged between 64% in the *Teamwork within Units* dimension and 24% in the *Staffing* dimension (Table 5.3).

The responses indicated that only two areas were considered areas of strength in the 15 public hospitals: *Teamwork within Units* (64%) and *Organisational Learning–Continuous Improvement* (62%) (Table 5.3). All the remaining dimensions were considered areas for improvement. The very low positive responses were in *Staffing* (24%), *Handoffs & Transitions* (26%), *Teamwork across Units* (32%), *Communication Openness* (33%), *Management Support for Patient Safety* (36%), *Supervisor/Manager Expectations & Actions Promoting Patient Safety* (38%), *Overall Perception of Patient Safety* (42%), *Feedback & Communication about Errors* (42%), *Non-punitive Response to Error* (42%) and *Frequency of Events Reported* (45%).

**Table 5.3** Positive Responses on Patient Safety Culture Dimensions

Patient safety culture dimensions	Average percentage of positive responses
Teamwork within Units	64%
Organisational Learning–Continuous Improvement	62%
Frequency of Events Reported	45%
Non-punitive Response to Error	42%
Feedback & Communication about Error	42%
Overall Perception of Patient Safety	42%
Supervisor/Manager Expectations & Actions Promoting Patient Safety	38%
Management Support for Patient Safety	36%
Communication Openness	33%
Teamwork across Units	32%
Handoffs & Transitions	26%
Staffing	24%

5.3.2 OVERALL RESPONSE TO EACH ITEM OF PATIENT SAFETY CULTURE

5.3.2.1 Teamwork within Units

The *Teamwork within Units* dimension had four positively worded items. This dimension aimed to examine the perception of participants towards the teamwork concept within hospital units. The majority of respondents (71%) agreed that they support each other in their work areas. Around 61% of respondents indicated how they cooperate as a team to get the work done quickly and 52% agreed that they treat each other with respect (Table 5.4).

**Table 5.4** Positive Response to *Teamwork within Units*

Safety culture dimensions	Responses		
	Positive	Neutral	Negative
<b>1. Teamwork within Units (4 items)</b>			
1. People support one another in this unit (A1)	71%	12%	17%
2. When a lot of work needs to be done quickly, we work together as a team to get the work done (A3)	61%	13%	26%
3. In this unit, people treat each other with respect (A4)	70%	12%	18%
4. When one area in this unit gets really busy, others help out. (A11)	52%	24%	24%




5.3.2.2 *Supervisor/Manager Expectations & Actions Promoting Patient Safety*

Table 5.5 indicates the perception of healthcare providers and managers towards *Supervisor/Manager Expectations & Actions Promoting Patient Safety*. This dimension had four items, two of which (B3 and B4) are negatively worded.

Less than half of the respondents (43%) felt that their supervisor or manager appreciates their compliance with patient safety guidelines. However, as much as 38% felt unappreciated while 19% did not agree or disagree with this item.

In another item about staff suggestions to improve patient safety, only 45% of the respondents agreed with this view, while 55% did not agree or answer. Interestingly, 47% of participants agreed that their managers want them to work faster even if it affects patient safety. The results also revealed that 42% of participants think that their manager overlooks patient safety issues that occur repeatedly.

**Table 5.5** Staff perception of *Supervisor/Manager Expectations & Actions Promoting Patient Safety*




Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>2. Supervisor/Manager Expectations &amp; Actions Promoting Patient Safety (4 items)</b>			
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures (B1)	43%	19%	38%
2. My supervisor/manager seriously considers staff suggestions for improving patient safety (B2)	45%	22%	33%
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts (B3R)	31%	23%	47%
4. My supervisor/manager overlooks patient safety problems that happen over and over (B4R)	32%	26%	42%

Note: "R" = A negatively worded item

5.3.2.3 *Organisational Learning—Continuous Improvement*

Table 5.6 presents the responses of respondents to three items of the *Organisational Learning and Continues Improvement* dimension. Overall, participants showed positive perception in this dimension. More than three-quarters (78%) of the sample agreed that they do things actively to improve patient safety. The findings also indicated that almost one-half of participants (47%) disagreed or preferred not to answer about the evaluation of changes to improve patient safety. However, 53% of participants agreed that the effectiveness of any changes related to improving patient safety were not evaluated or assessed to measure their impact on patient safety practices.

**Table 5.6** Staff Perception of *Organisational Learning—Continuous Improvement*

Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>3. Organisational Learning—Continuous Improvement (3 items)</b>			
1. We are actively doing things to improve patient safety (A6)	78%	9%	13%
2. Mistakes have led to positive changes here (A9)	54%	18%	28%
3. After we make changes to improve patient safety, we evaluate their effectiveness (A13)	53%	20%	27%

### 5.3.2.4 Management Support for Patient Safety

Management support for patient safety is an important factor. The *Management Support for Patient Safety* dimension had three items, of which one item (F9) was negatively worded (Table 5.7). This dimension aimed to examine the perception of participants towards management efforts to support patient safety.

As many as 38% of participants thought that management provides a work climate that supports or improves patient safety. On the other hand, 38% had a negative perception of this item, and 24% preferred not to answer, which can be interpreted as a negative perception. Surprisingly, 58% of the respondents agreed that “hospital management seems interested in patient safety only after an adverse event happens” (Table 5.7).

**Table 5.7** Staff Perception of *Management Support for Patient Safety*

Safety culture dimensions	Responses		
	Positive	Neutral	Negative
<b>4. Management Support for Patient Safety (3 items)</b>			
1. Hospital management provides a work climate that promotes patient safety (F1)	38%	24%	38%
2. The actions of hospital management show that patient safety is a top priority (F8)	47%	20%	33%
3. Hospital management seems interested in patient safety only after an adverse event happens (F9R)	21%	20%	58%

Note: “R” = A negatively worded item

5.3.2.5 Overall Perception of Patient Safety

Table 5.8 shows the overall perception of patient safety among all participants. This dimension aims to explore the perception of safety culture among participants. It consists of four items, two of which are negatively worded (Table 5.8).

More than one-third of the respondents (38%) agreed that they have patient safety problems in their hospitals and 41% agreed that it is “just by chance that more serious mistakes don’t happen” in their hospitals. In addition, 39% admitted that their procedures and systems are not good at preventing errors from happening.

**Table 5.8 Overall Perception of Patient Safety**




Safety culture dimensions	Responses		
	Positive	Neutral	Negative
<b>5. Overall Perception of Patient Safety (4 items)</b>			
1. It is just by chance that more serious mistakes don't happen around here (A10R)	41%	27%	32%
2. Patient safety is never sacrificed to get more work done. (A15)	57%	21%	22%
3. We have patient safety problems in this unit. (A17R)	38%	21%	41%
4. Our procedures and systems are good at preventing errors from happening. (A18)	31%	30%	39%

Note: “R” = A negatively worded item

5.3.2.6 *Feedback & Communication about Error*

According to 41% of the respondents, they are not informed when errors occur in their unit (Table 5.9) indicating a lack of communication and feedback about error. In addition, 41% of the respondents confirmed that they do not discuss ways to prevent errors and 21% preferred not to answer this item (Table 5.9).

**Table 5.9** Staff Perception of *Feedback & Communication about Error*




Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>6. Feedback &amp; Communication About Error (3 items)</b>			
1. We are given feedback about changes put into place based on event reports (C1)	55%	24%	21%
2. We are informed about errors that happen in this unit (C3)	38%	21%	41%
3. In this unit, we discuss ways to prevent errors from happening again (C5)	32%	43%	25%



5.3.2.7 *Communication Openness*

Effective communication is vital for success in patient safety culture. Nearly two-thirds (60%) of respondents agreed that they do not “feel free to question the decisions or actions of those with more authority” (Table 5.10). Likewise, 42% think that they cannot “freely speak up if they see something that may negatively affect patient care”.

**Table 5.10** Staff Perception of *Communication Openness*




Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>7. Communication Openness (3 items)</b>			
1. Staff will freely speak up if they see something that may negatively affect patient care (C2)	36%	22%	42%
2. Staff feel free to question the decisions or actions of those with more authority (C4)	18%	22%	60%
3. Staff are afraid to ask questions when something does not seem right (C6R)	45%	28%	27%

Note: “R” = A negatively worded item

5.3.2.8 Frequency of Events Reported

Table 5.11 shows how healthcare providers and managers perceived error reporting in their hospitals. Almost half of the respondents (49%) indicated that they would report a mistake that could harm the patient compared to 23% who would not report the error and 28% preferred not to answer. Moreover, 47% of respondents will not report errors that were caught and corrected before affecting the patients, while 39% will not report any errors if there is no potential to harm the patient. These findings indicate how healthcare clinicians and managers perceive AE reporting and may explain the low rate of AE reports.




**Table 5.11** Staff Perception of Frequency of Events Reported

Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>8. Frequency of Events Reported (3 items)</b>			
1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? (D1)	47%	24%	29%
2. When a mistake is made, but has no potential to harm the patient, how often is this reported? (D2)	39%	26%	34%
3. When a mistake is made that could harm the patient, but does not, how often is this reported? (D3)	49%	28%	23%

5.3.2.9 Teamwork across Units

This dimension of safety culture reflects the view of participants towards teamwork and the level of cooperation occurred between different units within their hospital. A high level of cooperation and teamwork can ensure or maintain adequate and safe patient care. Table 5.12 demonstrates how staff perceived the *Teamwork across Units* concept. This dimension contains four items (two negatively worded items, F1 and F3). As shown, 38% of participants agreed that hospital units do not coordinate well with each other compared to 33% who disagreed. Similarly, 39% disagreed that the units cooperate well together to provide good patient care while 26% agreed. Moreover, one-third (33%) of respondents felt that it was unpleasant working with staff from other units in the hospital.

**Table 5.12** Staff Perception of *Teamwork across Units*

Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>9. Teamwork across Units (4 items)</b>			
1. Hospital units do not coordinate well with each other (F2R)	33%	29%	38%
2. There is good cooperation among hospital units that need to work together (F4)	37%	28%	35%
3. It is often unpleasant to work with staff from other hospital units (F6R)	32%	35%	33%
4. Hospital units work well together to provide the best care for patients (F10)	26%	35%	39%

Note: "R" = A negatively worded item

5.3.2.10 Staffing

Table 5.13 displays participant responses to items from the *Staffing* dimension. This dimension includes four items (three negatively worded items) related to the staffing level. The majority of respondents disagreed that they have enough staff to handle the workload (71%). Almost half of the sample (49%) agreed that they work longer hours, which affects patient care. In addition, 52% agreed that the workload is very high, and that they have to do things very quickly.

**Table 5.13** Staff Perception of *Staffing*

Safety culture dimensions	Responses		
	Positive	Neutral	Negative
<b>10. Staffing (4 items)</b>			
1. We have enough staff to handle the workload (A2)	19%	10%	71%
2. Staff in this unit work longer hours than is best for patient care (A5R)	26%	25%	49%
3. We use more agency/temporary staff than is best for patient care (A7R)	28%	37%	35%
4. We work in “crisis mode” trying to do too much, too quickly (A14R)	25%	23%	52%




Note: “R” = A negatively worded item

5.3.2.11 Handoffs & Transitions

The responses of respondents in the *Handoffs & Transition* dimension are summarised in Table 5.14. This dimension covers four items (all negatively worded) related to patient handoffs and transitions. Overall, participants agreed that they have problems in patient handoffs and transitions process. Half of the sample (50%) agreed that the problems occur in the exchange of information across hospital units while 57% felt that there are some problems when transferring patients from one unit to another. Furthermore, 47% of participants claimed important patient care information is lost during shift changes. The results also indicated that 39% of the responses highlighted a critical problem with shift changes, which may negatively affect patient safety.

The findings revealed serious problems in the process of handoffs in shift changes and during patient transitions between units in the hospital.

**Table 5.14** Staff Perception of *Handoffs & Transitions*




Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>11. Handoffs &amp; Transitions (4 items)</b>			
1. Things “fall between the cracks” when transferring patients from one unit to another (F3R)	21%	21%	57%
2. Important patient care information is often lost during shift changes (F5R)	22%	30%	47%
3. Problems often occur in the exchange of information across hospital units (F7R)	26%	24%	50%
4. Shift changes are problematic for patients in this hospital (F11R)	36%	25%	39%

Note: “R” = A negatively worded item

5.3.2.12 *Non-punitive Response to Error*

This dimension contains three negatively worded items that show how participants perceive the openness of error reporting. Most of the respondents (41%) felt that their mistakes are held against them while 45% of them thought it was the staff being punished rather than investigating the causes of the error. More than one-third of the respondents (38%) felt worried that their mistakes may be kept in their personnel file while 52% did not have the same concern (Table 5.15). In general, the results revealed that a blame-free culture does not exist in many public hospitals.

**Table 5.15** Staff Perception of *Non-punitive Response to Error*

Safety culture dimensions	Responses		
	Positive 	Neutral 	Negative 
<b>12. Non-punitive Response to Error (3 items)</b>			
1. Staff feel like their mistakes are held against them (A8R)	39%	21%	41%
2. When an event is reported, it feels like the person is being written up, not the problem (A12R)	36%	19%	45%
3. Staff worry that mistakes they make are kept in their personnel file (A16R)	52%	10%	38%

Note: "R" = A negatively worded item

### 5.3.2.13 Patient Safety Grade

On a scale from 1 to 5 (one is excellent and five is failing), all respondents were requested to evaluate the overall patient safety at their hospital.

Almost half of participants indicated that the overall patient safety grade was very good ( $n = 513$ , 47%), and only 35 respondents (3.2%) indicated that it was excellent. As many as 41.7% considered the patient safety grade as acceptable in their workplace. However, 71 respondents indicated the safety grade as poor and 22 selected failing (Table 5.16). In addition, Table 5.16 shows the patient safety grade across different job positions in their work areas.

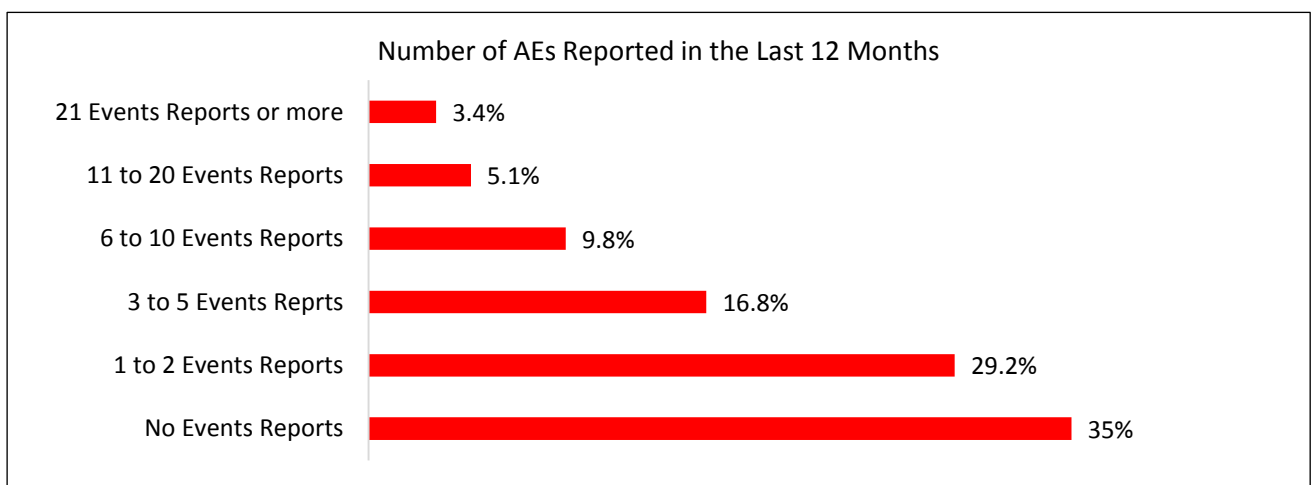
**Table 5.16** Culture of *Patient Safety Grade* based on Profession

Grade	Doctors		Nurses		Hospital manager		Unit manager		Other	
	<i>n</i>	%	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)
Excellent	5	2.3	21	3.5	1	2	2	4.9	5	2.8
Very good	107	48.9	283	47.2	21	42	16	39	82	46.1
Acceptable	83	37.9	253	42.2	24	48	20	48.8	73	41
Poor	19	8.7	32	5.3	3	6	2	4.9	15	8.4
Failing	5	2.3	11	1.8	1	2	1	2.4	3	1.7
Mean (SD)*	2.60 (0.77)		2.55 (0.73)		2.64 (0.72)		2.61 (0.77)		2.60 (0.75)	

Note: \* To calculate the mean and standard deviation, responses were given values to evaluate patient safety culture (excellent = 1, very good= 2, acceptable = 3, poor = 4 and failing = 5)

#### 5.3.2.14 Number of Events Reported in the Last 12 Months

Participants were asked to indicate the number of AEs they reported in the last 12 months. About one-third (35%,  $n = 385$ ) did not report any AEs in the last 12 months. Almost half of the participants (46.7%,  $n = 514$ ) indicated that they had reported 1–5 AEs in the last 12 months. However, 14.9% ( $n = 164$ ) reported 6–20 AEs and only 3.4% ( $n = 37$ ) reported  $\geq 21$  AEs in the last 12 months (Figure 5.2).

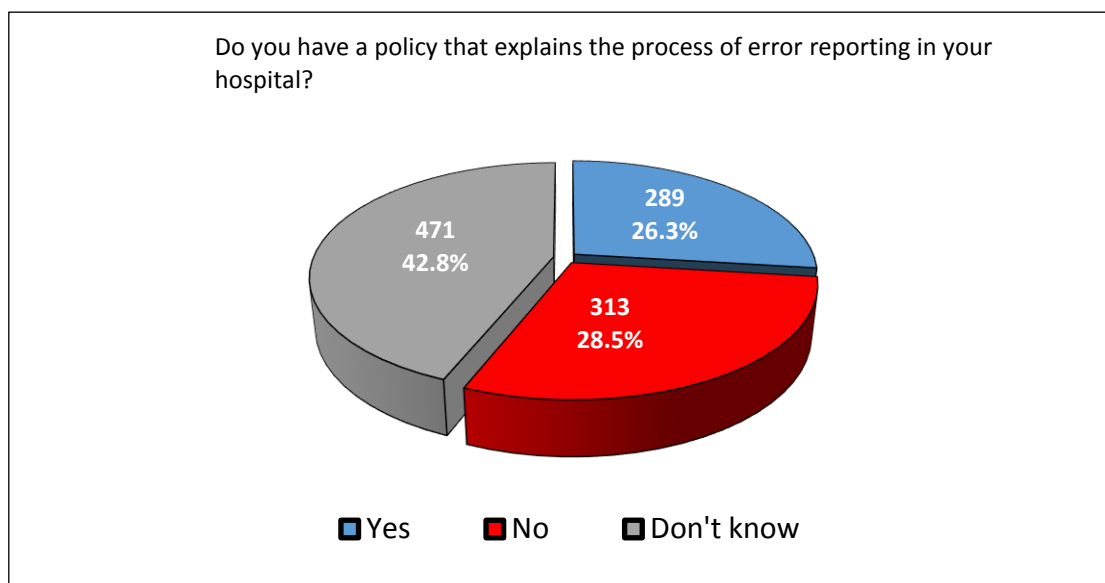


**Figure 5.2** Number of AEs Reported in the Last 12 Months



#### 5.4 AWARENESS OF ERROR REPORTING METHODS

In the culture of patient safety, reporting adverse events is crucial not only for medical records but as an opportunity to learn from and prevent the same errors from happening again. Figure 5.3 illustrates the frequency distribution of the responses to the question “Do you have a policy that explains the process of error reporting in your hospital?”.



**Figure 5.3** Participant Awareness of Error Reporting Methods

Of those who answered this question, about one-third ( $n = 289$ , 26.3%) were aware of the policy to report errors in their hospital. However, about one-half ( $n = 471$ , 42.8%) answered that they are not aware of any policy related to error reporting, while about one-quarter ( $n = 313$ , 28.5%) answered “no” there is no error reporting policy in this hospital. That is, more than two-thirds ( $n = 784$ , 71.3%) of the respondents were either not aware of the reporting policy or thought that there was no policy on error reporting in their hospital. This finding will significantly affect the AE reporting rate.

## 5.5 DIFFERENCES IN THE DIMENSIONS OF PATIENT SAFETY CULTURE BASED ON THE HEALTH ACCREDITATION STATUS OF HOSPITALS

### 5.5.1 DIFFERENCES IN THE COMPOSITE SCORES OF PATIENT SAFETY CULTURE DIMENSIONS

The positive responses to the HSOPSC were compared between accredited and non-accredited hospitals (Table 5.17). In general, accredited hospitals scored higher composite positive responses to the HSOPSC dimensions than non-accredited hospitals.

However, the positive response scores to patient safety culture dimensions in both accredited and non-accredited hospitals were below the recommended 75% cut-off for areas of strength except for *Organisational Learning–Continuous Improvement* in accredited hospitals.

The highest positive scores in the accredited hospitals were for *Organisational Learning–Continuous Improvement* (80%) and *Teamwork within Units* (72%). The remaining ten dimensions scored low responses, with the lowest being *Staffing* (26%), *Handoffs & Transitions* (26%), *Teamwork across Units* (30%), *Management Support for Patient Safety* (37%) and *Communication Openness* (37%).

In the non-accredited hospitals, the highest composite score was for *Teamwork across Units* (55%) and the lowest scores were for *Staffing* (23%), *Handoffs & Transitions* (27%), *Frequency of Events Reported* (30%), *Non-punitive Response to Error* (30%), and *Supervisor/Manager Expectations & Actions Promoting Patient Safety* (31%).

While there were significant differences between accredited and non-accredited hospitals in the positive response scores to patient safety culture dimensions, all hospitals had weak patient safety scores in almost all items of safety culture.

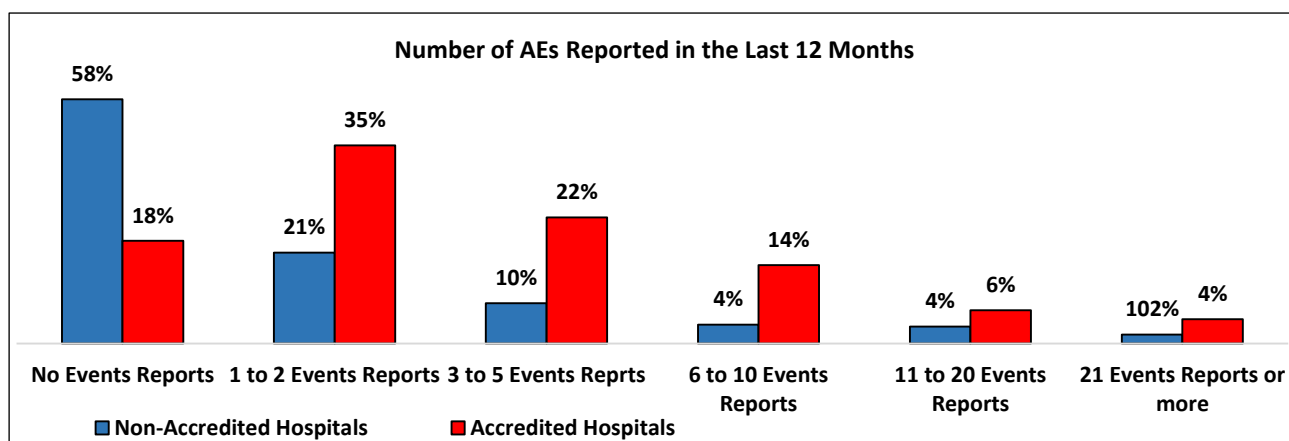
**Table 5.17** Positive Responses to the HSOPSC in Accredited and Non-accredited Hospitals

Dimensions of Patient Safety Culture	Average Percentage of Positive Responses	
	Accredited Hospitals	Non-Accredited Hospitals
Organisational Learning–Continuous Improvement	80%	51%
Teamwork within Units	70%	55%
Frequency of Events Reported	57%	30%
Non-punitive Response to Error	51%	30%
Overall Perception of Patient Safety	46%	37%
Feedback & Communication about Error	43%	40%
Supervisor/Manager Expectations & Actions	43%	31%
Promoting Patient Safety	37%	34%
Management Support for Patient Safety	37%	28%
Communication Openness	37%	28%
Teamwork across Units	30%	35%
Handoffs & Transitions	26%	27%
Staffing	26%	23%

### 5.5.2 DIFFERENCES IN THE NUMBER OF EVENTS REPORTED IN THE LAST 12 MONTHS

The number of AEs reported in the last 12 months was compared between accredited and non-accredited hospitals and the difference was statistically significant,  $\chi^2 (5, n = 1092) = 192.01, p = < 0.001$ .

Figure 5.4 shows that the majority of respondents ( $n = 271, 58\%$ ) in non-accredited hospitals had not reported any events in the last 12 months. In addition, only 11% ( $n = 50$ ) of healthcare providers and managers had reported six or more AEs. In accredited hospitals, the majority of respondents ( $n = 511, 81\%$ ) had reported at least one or more AEs in the last 12 months whereas 18% ( $n = 114$ ) had not reported any AEs. In general, the number of events reported in the last 12 months in accredited hospitals was significantly more than non-accredited hospitals.



**Figure 5.4** Number of AEs Reported in Accredited and Non-accredited Hospitals

### 5.5.3 DIFFERENCES IN THE OVERALL PATIENT SAFETY GRADE

The overall *Patient Safety Grade* is a single 5-point item in the HSOPSC in which participants give an overall patient safety grade for their work areas. The grade scale ranged from excellent through to failing. The results identified significant differences between hospitals  $\chi^2(4, n = 1100) = 120.35, p = <0.001$ .

It is apparent from Figure 5.5 that participants working in accredited hospitals graded their workplaces higher than those working in non-accredited hospitals. The majority of respondents in accredited hospitals ( $n = 363, 58\%$ ) ranked their work areas as “very good” compared to 32% ( $n = 150$ ) in non-accredited hospitals. Significant differences were observed for “failing” and “poor” grades. In accredited hospitals, only 3.2% ( $n = 20$ ) ranked their workplaces as “poor” or “failing” while 16% ( $n = 73$ ) of participants working in non-accredited hospitals selected “poor” or “failing” as patient safety grade for their work areas (Figure 5.4).

In brief, 97% of participants working in accredited hospitals ranked the patient safety culture as acceptable, very good or excellent compared to 85% in non-accredited hospitals.

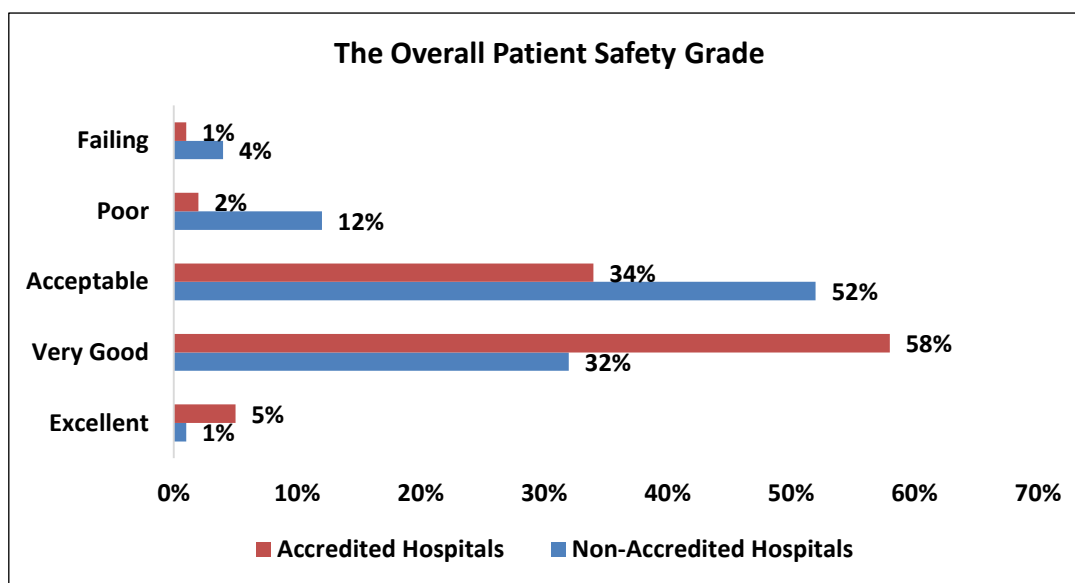


Figure 5.5 Overall Patient Safety Grade

#### 5.5.4 DIFFERENCES IN THE AWARENESS OF ERROR REPORTING METHODS

Participants were requested to indicate their knowledge of the policy that explains error reporting methods in their workplace. A chi-square test was conducted, and a significant relationship observed between hospital accreditation and participants' awareness towards error reporting policy/methods,  $\chi^2(2, n = 1073) = 91.84, p = < 0.001$ . The answers varied mainly between participants based on their working hospitals (Figure 5.6).

In accredited hospitals, almost one-half of the participants (47%,  $n = 294$ ) were unaware of any error reporting policy, and approximately one-third (34.3%,  $n = 216$ ) knew about the error reporting policy, while 19% ( $n = 117$ ) were not sure if they have a policy to report errors in their hospital.

In non-accredited hospitals, about one-third of the participants (37.7%,  $n = 177$ ) were unaware of the policy for reporting errors, and nearly half (41.7%,  $n = 196$ ) did not know about the error reporting policy in their hospital, whereas only 15.5% ( $n = 73$ ) were aware of the hospital policy for reporting errors.

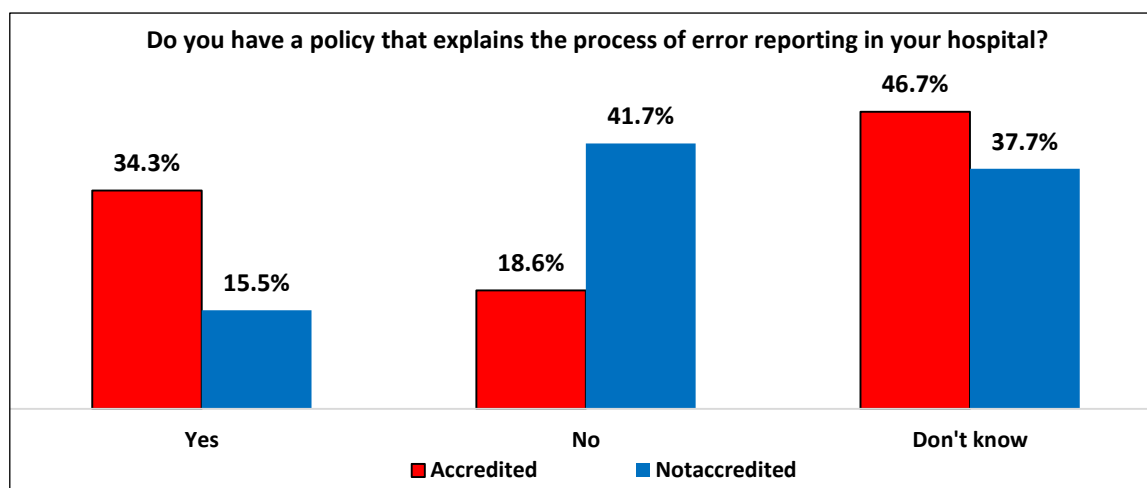


Figure 5.6 Awareness Differences in Error Reporting Policy and Methods

## 5.6 FACTORS AFFECTING PATIENT SAFETY CULTURE

The factors affecting patient safety culture were examined in three steps. Step 1 explored the correlation between the patient safety culture dimensions. Step 2 examined the effect of participant characteristics (gender, nationality, education, staff position, working hours, patient contact, years in profession, years in hospitals, monthly income, and marital status) and hospital characteristics (hospital accreditation status and hospital size) on the two selected outcome variables of patient safety culture (*Overall Perception of Patient Safety* and *Frequency of Events Reported*). Step 3 evaluated the effect of patient safety culture dimensions (independent variables) on the overall *perception of patient safety* and *frequency of events*.

### 5.6.1 STEP 1: CORRELATIONS BETWEEN PATIENT SAFETY CULTURE DIMENSIONS

A matrix of Pearson's ( $r$ ) correlation coefficients was performed to assist with the association between safety culture composites (Table 5.4). The results revealed moderate and weak significant correlations between variables. The correlation coefficient size offers the strength and direction of the relationship between variables. Cohen's<sup>251</sup> recommendations were followed to interpret the absolute correlation coefficient as follows:

- Small correlation, if  $r$  falls between 0.10 and 0.29
- Moderate correlation, if  $r$  falls between 0.30 and 0.49
- Strong correlation, if  $r$  falls between 0.50 and 1.0.

Therefore, any small correlations ( $r = \leq 0.29$ ) were not reported.

In general, patient safety culture was significantly correlated with almost all safety dimensions. However, the strength and directions of the correlations differed across dimensions. The highest significantly negative linear correlation was observed between *Feedback & Communication about Error* and *Non-punitive Response to Error* ( $r = -0.434, p < 0.001$ ). Three moderately significant correlations were observed between *Overall Perception of Patient Safety* and *Frequency of Errors Reported*, *Organisational Learning–Continuous Improvement*, and *Non-punitive Response to Error*. In addition, three moderate correlations were observed in the *Teamwork within Units* dimensions and *Feedback & communication error* ( $r = 0.374, p < 0.001$ ), *Organisational Learning–Continuous Improvement* ( $r = 0.354, p < 0.001$ ), and *Non-punitive Response to Error* ( $r = -0.317, p < 0.001$ ).

## 5.6.2 STEP 2: RELATIONSHIP BETWEEN PARTICIPANT AND HOSPITAL CHARACTERISTICS AND OVERALL PERCEPTION OF PATIENT SAFETY AND FREQUENCY OF EVENTS REPORTED

### 5.6.2.1 Relationship between Participant and Hospital Characteristics and Overall Perception of Patient Safety

An independent sample *t*-test and ANOVA test were used to test for bivariate associations between the overall perception of patient safety and hospital and demographic variables (Table 5.19). The *Overall Perception of Patient Safety* dimension was the dependent variable, and all remaining variables were independent.

#### Gender

The gender of respondents was not significantly associated with the positive perception of patient safety culture. There was no significant difference between the mean score for females ( $M = 10.23, SD = 1.82$ ) and that of males ( $M = 10.02, SD = 1.79$ ),  $t(1046) = 1.79, p = 0.073$ . These findings suggest that gender does not have a significant effect on the perception of patient safety culture.

**Table 5.18** Correlations between Safety Culture Dimensions

Safety dimensions	1 OPPS	2 FER	3 TWU	4 MEA PPS	5 OLCI	6 MSPS	7 FCA E	8 CO	9 TAU	10 ST	11 HT	12 NPRTE
1. OPPS	1											
2. FER	<b>0.405*</b>	1										
3. TWU	0.075**	0.231*	1									
4. MAPPs	0.122**	0.052*	<b>0.086**</b>	1								
5. OLCI	<b>0.423**</b>	0.153**	<b>0.354**</b>	0.080*	1							
6. MSPS	0.001	0.177**	-0.135**	0.052	0.158**	1						
7. FCAE	0.065*	<b>0.395*</b>	<b>0.374**</b>	0.075**	<b>0.467**</b>	-0.061**	1					
8. CO	0.042	0.070*	0.120**	0.148**	0.084	0.052	0.287**	1				
9. TAU	0.073**	0.105**	<b>0.191**</b>	0.111**	0.173**	-0.162**	0.193**	0.213**	1			
10. ST	0.072**	<b>0.350*</b>	<b>0.151**</b>	0.022	0.084**	0.159**	-0.034	0.0476	<b>0.330</b>	1		
11. HT	0.140	0.063*	0.018	0.048	0.076*	<b>-0.345**</b>	0.053	0.042	0.198**	0.014	1	
12. NPRTE	<b>0.398**</b>	<b>0.461*</b>	<b>-0.317**</b>	0.070*	0.190**	0.227**	<b>-0.434**</b>	0.074*	0.133**	0.178**	0.180**	1

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

**1. OPPS** = Overall Perception of Safety, **2. FER** = Frequency of Events Reported, **3. TWU** = Teamwork within Units, **4. MEAPPS** = Supervisor/Manager Expectations & Actions Promoting Patient Safety, **5. OLCI** = Organisational Learning–Continuous Improvement, **6. MSPS** = Management Support for Patient Safety, **7. FCAB** = Feedback & Communication about Error, **8. CO** = Communication Openness, **9. TAU** = Teamwork across Units, **10. ST** = Staffing, **11. HT** = Handoffs & Transitions, **12. NPRTE** = Non-punitive Response to Error



**Table 5.19** Overall Perception of Patient Safety by Hospital and Demographic Variables

Variable	Mean	SD	t/F-value	P-value
<b>Gender</b>				<b>0.073</b>
Female	10.23	1.82	1.79	
Male	10.02	1.79		
<b>Age group</b>				<b>0.159</b>
20 to 29	10.27	1.79	1.73	
30 to 39	9.96	1.83		
40 to 49	10.13	1.93		
≥50	10.12	1.66		
<b>Nationality</b>				<b>0.017</b>
Other	10.25	1.79	2.39	
Saudi	9.98	1.84		
<b>Language</b>				<b>0.006</b>
English	10.30	1.78	2.77	
Arabic	9.99	1.82		
<b>Marital status</b>				<b>0.448</b>
Not married	10.20	1.94	0.760	
Married	10.11	1.73		
<b>Education level</b>				<b>0.423</b>
Institute degree	10.01	1.83	0.969	
College degree	10.03	1.78		
Bachelor	10.20	1.92		
Postgraduate degree	10.13	1.61		
Other degree	10.47	1.80		
<b>Hospital size</b>				<b>0.999</b>
Small	10.13	2.04	-0.001	
Large	10.13	1.64		
<b>Hospital accreditation</b>				<b>&lt;0.001</b>
No	9.66	1.89	-7.63	
Yes	10.48	1.66		
<b>Organisational tenure</b>				<b>0.034</b>
≤ 5 years	10.24	1.87	3.38	
6 to 10 years	10.21	1.74		
≥ 11 years	9.89	1.72		

Variable	Mean	SD	t/F-value	P-value
≤ 5 years	10.15	1.74		0.645
6 to 10 years	10.21	1.75	0.439	
≥ 11 years	10.09	1.89		
<b>Working hours per week</b>				0.58
≤20	9.81	1.72		
20 to 39	9.58	1.88	2.86	
≥40	10.18	1.80		
<b>Direct contact with patient</b>				<0.001
No	9.69	1.67		
Yes	10.21	1.83	-3.89	
<b>Monthly income</b>				0.260
≤5,000 SAR	10.19	1.92		
5,000 to 10,000 SAR	10.21	1.86		
10,001 to 15,000 SAR	9.97	1.68	1.34	
≥15,001 SAR	9.97	1.64		

### Age Group

Patricians were organised into four groups according to their age (see Table 5.5). A one-way ANOVA was conducted to examine the effect of age-group on the overall perception of patient safety culture.

The findings show no significant association at the  $p < 0.05$  level in the overall perception of patient safety culture for the four age-groups:  $F(3) = 1.73$ ,  $p = 0.159$ . This result indicates that there was insufficient evidence to suggest that the age of participants has an effect on the overall perception of patient safety culture.

### Nationality

The nationality of participants was significantly associated with the overall perception of patient safety culture. The result shows a significant difference in score for Saudi ( $M = 9.98$ ,  $SD = 1.84$ ) compared with other nationalities ( $M = 10.25$ ,  $SD = 1.79$ ),  $t(1059) = 2.39$ ,  $p = 0.017$ . Non-Saudi healthcare providers and managers had more positive perceptions of patient safety culture. The magnitude of the difference between means (mean difference = 0.27, 95% CI: 0.05 to 0.49) had a small effect size (eta squared = 0.148) which suggests that the participants' nationality explains 14% of the variance in the overall perception of patient safety culture.

### Language

The spoken language of the healthcare providers and managers was significantly associated with the overall perception of patient safety culture. There was a significant difference in the score for those who speak English ( $M = 10.30$ ,  $SD = 1.78$ ) compared to Arabic speakers ( $M = 9.99$ ,  $SD = 1.82$ ),  $t(1054) = 2.77$ ,  $p = 0.006$ . English speaking staff had a more positive mean score related to the overall perception of patient safety culture. The differences in the mean (0.31, 95% CI: 0.091 to 0.527) revealed a small effect size (eta squared = 0.172). It means that the language spoken by the respondents explains <17% of the variance in the perception of patient safety culture.

### Education Level

Participants were allocated into five groups according to their education level. At the  $p < 0.05$  level, the education level of respondents was not significantly associated with a positive perception of patient safety culture:  $F(4, 1038) = 0.969$ ,  $p = 0.423$ .

### Hospital Size

The hospital size was divided into two groups based on the bed capacity of each hospital. There was no significant difference in the mean score for small hospitals ( $M = 10.13$ ,  $SD = 1.89$ ) compared to large hospitals ( $M = 10.13$ ,  $SD = 1.66$ ),  $t(1097) = -0.001$ ,  $p = 0.999$ .

### Hospital Accreditation Status

The accreditation status of the hospital was significantly associated with patient safety culture. There was a significant difference in the mean score for non-accredited hospitals ( $M = 9.66$ ,  $SD = 1.89$ ) compared to accredited hospitals ( $M = 10.48$ ,  $SD = 1.66$ ),  $t(1087) = -7.63$ ,  $p = 0.034$ . This indicates that staff in accredited hospitals had a higher positive mean score towards the perception of patient safety culture than staff in non-accredited hospitals. The magnitude of the difference in the means (mean difference =  $-0.82$ , 95% CI:  $-1.03$  to  $-0.61$ ) indicated a moderate effect (eta squared =  $-0.461$ ). This indicates that the accreditation status of the hospitals explains 46% of the variance in positive perception of patient safety culture.

### Organisational Tenure

Participants were divided into three groups according to years spent in the same hospital or workplace. Organisational tenure was significantly associated with the positive mean score of the perception of the patient safety culture and the difference at the  $p < 0.05$  level was

significant:  $F(2,1054) = 3.38, p < 0.034$ . This indicates that the length of work experience can affect the perception of patient safety culture.

#### Professional Tenure

All respondents were divided into three groups according to their work experience in public hospitals. Professional tenure was not significantly associated with the positive perception of patient safety culture and the difference at the  $p < 0.05$  level was not significant:  $F(2,1066) = 0.439, p < 0.645$ .

#### Working Hours Per Week

The working hours approached a significant effect on the positive perception of patient safety culture. Respondents were divided into three groups according to the number of hours per week they work in their hospitals (see Table 5.5). The result revealed no significant difference at the  $p < 0.05$  level in the perception of patient safety culture:  $F(2,1064) = 2.86, p < 0.058$ . However, participants in the group who worked  $\geq 40$  hours per week had the highest mean score (10.21) which may suggest that long working hours are associated with the positive perception of patient safety culture compared to other groups.

#### Direct Contact with Patients

Participants were assigned into two groups based on their interaction with patients. There was a significant difference in the mean score for staff who reported to have direct contact with patients in non-accredited hospitals ( $M = 10.21, SD = 1.83$ ) compared to other groups ( $M = 9.69, SD = 1.67$ ),  $t(1054) = -3.89, p = \leq 0.001$ . This indicates that respondents who had direct contact with patients had a higher positive mean score towards the perception of patient safety culture. The magnitude of the difference in the means (mean difference =  $-0.52$ , 95% CI:  $-0.79$  to  $-0.24$ ) indicated a large effect (eta squared = 1.09).

#### Monthly Income

The monthly income of participants was divided into four groups (see Table 5.5). The result showed no significant difference between groups at the  $p < 0.05$  level in the perception of patient safety culture:  $F(3,1064) = 1.34, p < 0.260$ . However, the mean score for the positive perception of patient safety culture in the two lowest income groups ( $M = 10.19$  and  $M = 10.21$ ) was higher than the high-income groups.

### Marital Status

The participants' marital status was divided into three groups (married, not married, and other). Only 56 participants selected the "other" option, so for the independent sample *t*-test, they were excluded and only "married" or "not married" included in the test. There was no significant difference in the mean score for unmarried participants ( $M = 10.20$ ,  $SD = 1.94$ ) compared to married ( $M = 10.11$ ,  $SD = 1.73$ ),  $t(997) = 0.76$ ,  $p = 0.448$  in relation to the perception of patient safety culture.

### 5.6.2.2 *Relationship between Participant and Hospital Characteristics and Frequency of Events Reported*

An independent sample *t*-test and ANOVA analysis were used to explore whether a significant relationship exists between participant and hospital characteristics and the frequency of events reported. The *Frequency of Events Reported* dimension was the dependent variable and all remaining variables were independent. Table 5.6 shows the relationship between these variables

**Table 5.20** Relationship between Hospital and Demographic Variables and Frequency of Events Reported

Variable	Mean	SD	t/F-value	P-value
<b>Gender</b>				0.995
Female	7.36	2.17	0.007	
Male	7.36	2.24		
<b>Age group</b>				0.159
20 to 29	10.27	1.79	1.73	
30 to 39	9.96	1.83		
40 to 49	10.13	1.93		
≥50	10.12	1.66		
<b>Nationality</b>				<b>0.015</b>
Other	7.22	2.20	-2.422	
Saudi	7.55	2.15		
<b>Language</b>				0.603
English	7.39	2.20	0.521	
Arabic	7.32	2.19		

Variable	Mean	SD	t/F-value	P-value
<b>Marital status</b>				0.691
Not married	7.36	2.19	0.397	
Married	7.30	2.19		
<b>Education level</b>				0.111
Institute degree	7.53	2.31	1.884	
College degree	7.32	2.16		
Bachelor	7.44	2.21		
Postgraduate degree	7.12	2.11		
Other degree	6.80	2.27		
<b>Hospital size</b>				<0.001
Small	6.81	2.07	-6.637	
Large	7.70	2.21		
<b>Hospital accreditation</b>				<0.001
No	6.59	2.02	-10.099	
Yes	7.90	2.17		
<b>Organisational tenure</b>				0.606
≤5 years	7.33	2.10	0.501	
6 to 10 years	7.31	2.28		
≥11 years	7.48	2.31		
<b>Professional tenure</b>				0.065
≤5 years	7.46	2.11	2.74	
6 to 10 years	7.48	2.23		
≥11 years	7.15	2.24		
<b>Working hours per week</b>				0.841
≤20	7.52	2.58	0.173	
20 to 39	7.51	2.57		
≥40	7.34	2.17		
<b>Direct contact with patient</b>				0.024
No	7.01	2.29	-2.350	
Yes	7.41	2.16		
<b>Monthly income</b>				0.698
≤5,000 SAR	7.27	2.23	0.477	
5,000 to 10,000 SAR	7.32	2.22		
10,001 to 15,000 SAR	7.50	2.07		
≥15,001 SAR	7.32	2.22		

### Gender

Gender of respondents was not statistically significantly associated with the frequency of events reported. There was no significant difference in the score for females ( $M = 7.36$ ,  $SD = 2.17$ ) compared to males ( $M = 7.36$ ,  $SD = 2.24$ ),  $t(1045) = 0.007$ ,  $p = 0.995$ . This finding suggests that gender does not have a significant effect on the frequency of events reported.

### Age Group

A one-way ANOVA was conducted to examine the effect of participant age on the frequency of events reported. No significant association between the participants' age and the frequency of events was reported at the  $p < 0.05$  level:  $F(3,982) = 2.42$ ,  $p = 0.64$ . This result suggests that the age of participants does not have any significant effect on the frequency of events reported. Nonetheless, the means score of the frequency of events reported increased with increasing participant age. This means that the staff in the older age-groups had a higher positive perception of the frequency of events reported.

### Nationality

The nationality of respondents was significantly associated with frequency of events reported. There was a significant difference in scores for non-Saudi healthcare providers and managers ( $M = 7.22$ ,  $SD = 2.20$ ) and Saudi ( $M = 7.55$ ,  $SD = 2.15$ ,  $t(1059) = -2.42$ ,  $p = 0.015$ ).

Saudi healthcare providers and managers had a higher positive mean score related to the frequency of events reported. The difference in the mean ( $-0.33$ , 95% CI:  $-0.597$  to  $-0.063$ ) revealed a small effect (eta squared = 0.151). It means that the language spoken by the respondents explained <15% of the variance in the frequency of events reported.

### Language

The language of the healthcare providers and managers was not significantly associated with the frequency of events reported. There was no significant difference in mean scores for non-Arabic speakers ( $M = 7.39$ ,  $SD = 2.20$ ) and Arabic speakers ( $M = 7.32$ ,  $SD = 2.19$ ),  $t(1054) = 0.521$ ,  $p = 0.603$ .

### Education Level

The education level of respondents was not significantly associated with the frequency of events reported variable. The result showed no significant difference at the  $p < 0.05$  level in the frequency of events reported for the four age-groups:  $F(4, 1036) = 1.88, p = 0.111$ .

### Hospital Size

Hospital size had a significant association with frequency of events reported,  $t(1086) = -6.63, p = <0.001$ , with large hospitals receiving a higher mean score ( $M = 7.70, SD = 2.21$ ) than small ( $M = 6.81, SD = 2.07$ ). Participants in larger hospitals were more likely to have a positive perception of the frequency of events reported than those in smaller hospitals. The magnitude of the difference in the means ( $-0.89, 95\% CI: -1.148$  to  $-0.624$ ) indicated a moderate size effect (eta squared = 0.415). This indicates that hospital size explains 41% of the variance in the frequency of events reported.

### Hospital Accreditation Status

The health accreditation status of hospitals revealed a significant difference in the mean score for non-accredited hospitals ( $M = 6.59, SD = 2.02$ ) compared to accredited hospitals ( $M = 7.90, SD = 2.17$ ),  $t(1086) = -10.09, p = <0.001$ .

This indicates that respondents in the accredited hospitals had a higher positive mean score in the frequency of events reported dimension. The magnitude of the difference in the means ( $-1.31, 95\% CI: -1.55$  to  $-1.05$ ) indicates a large effect size (eta squared = 0.788). This indicates that the accreditation status of the hospitals explains 79% of the variance in positive perception of frequency of events reported.

### Organisational Tenure

Organisational tenure was not significantly associated with the positive perception of the frequency of events reported and the mean difference at the  $p < 0.05$  level was not significant:  $F(2,1053) = 0.501, p < 0.606$ .

### Professional Tenure

There was no significant difference in the mean score at the  $p < 0.05$  level in the frequency of events reported for the three age-groups:  $F(2,1064) = 2.74, p < 0.065$ .



Working Hours Per Week

The working hours per week were not significantly associated with the positive perception of the *Frequency of Events Reported* safety dimension. However, a higher mean score was observed in the  $\leq 20$  h/week group ( $M = 7.52, SD = 2.58$ ) compared to other groups. This means that a better perception of the *Frequency of Events Reported* dimension correlated with fewer working hours per week.

Direct Contact with Patients

There was a significant association between direct contact with patients and the *Frequency of Events Reported* variable,  $t(1055) = -2.35, p = 0.024$ . Participants who had direct contact with patients had a higher mean score ( $M = 7.41, SD = 2.16$ ) than the other group with no direct contact with patients ( $M = 7.01, SD = 2.29$ ). The direct contact with patients group was more likely to report all types of AEs compared to the other group. The magnitude of the difference in the mean score ( $-0.4, 95\% CI = -0.738$  to  $-0.066$ ) indicated a small effect size (eta squared = 0.06). This suggests that direct contact with patients explains 17% of the variance in the *Frequency of Events Reported*.

### 5.6.3 STEP 3: RELATIONSHIP BETWEEN PATIENT SAFETY DIMENSIONS (INDEPENDENT VARIABLES) ON THE OVERALL PERCEPTION OF PATIENT SAFETY AND THE FREQUENCY OF EVENTS REPORTED

The results presented in Table 5.7 show that the overall perception of patient safety by respondents was significantly associated with six dimensions of patient safety culture. In this study, the respondents who perceived more hospital *Handoffs & Transitions* ( $\beta = 5.074, p < 0.001$ ), *Non-punitive Response to Error* ( $\beta = 4.863, P < 0.001$ ), *Organisational Learning–Continuous Improvement* ( $\beta = 3.283, P < 0.001$ ), *Supervisor/Manager Expectations & Actions Promoting Patient Safety* ( $\beta = 2.748, P < 0.005$ ), *Feedback & Communications about Error* ( $\beta = 2.406, P < 0.016$ ), and *Teamwork within Units* ( $\beta = 1.996, P < 0.046$ ) had a greater overall perception of patient safety.

The results in Table 5.7 reveal that only five of the ten patient safety culture dimensions were significantly associated with the frequency of events reported. The respondents who perceived more *Organisational Learning–Continuous Improvement* ( $\beta = 0.096, P = 0.03$ ), *Teamwork within Units* ( $\beta = 0.235, P < 0.001$ ), *Management Support for Patient Safety* ( $\beta =$

2.411,  $P = 0.015$ ), *Non-punitive Response to Error* ( $\beta = 0.158$ ,  $P < 0.00$ ), and *Teamwork across Units* ( $\beta = 0.073$ ,  $P = 0.022$ ) had more frequency of events reported.

**Table 5.21** Multiple Regression Analysis of Patient Safety Culture Measures on Overall *Patient Safety Grade* and *Frequency of Events Reported*

Variable	Overall perception of safety*			Frequency of event reports**		
	$\beta$	t-value	p-value	$\beta$	t-value	p-value
Non-Punitive Response to Error	0.178	<b>4.863</b>	<b>&lt; 0.001</b>	0.158	<b>4.368</b>	<b>&lt; 0.001</b>
Organisational Learning–Continuous Improvement	0.109	<b>3.283</b>	<b>0.001</b>	0.96	<b>2.933</b>	<b>0.003</b>
Teamwork within Units	0.070	<b>1.996</b>	<b>0.046</b>	0.235	<b>6.796</b>	<b>&lt; 0.001</b>
Handoffs & Transitions	0.167	<b>5.074</b>	<b>&lt; 0.001</b>	−0.034	−1.056	0.291
Supervisor/Manager Expectations & Actions Promoting Patient Safety	0.086	<b>2.784</b>	<b>0.005</b>	0.011	0.371	0.711
Feedback & Communications about Error	0.090	<b>2.406</b>	<b>0.016</b>	0.037	0.996	0.319
Management Support for Patient Safety	0.060	1.791	0.074	0.081	<b>2.441</b>	<b>0.015</b>
Teamwork across Units	0.026	0.796	0.426	0.073	<b>2.291</b>	<b>0.022</b>
Communication Openness	−0.053	−1.589	0.112	−0.013	−0.398	0.691
Staffing	0.36	1.158	0.247	−0.04	−0.117	0.907

\* $F(10,1027) = 8.520$ ,  $p < 0.000$   
\*\*  $F(10,1027) = 11.147$ ,  $p < 0.000$

## 5.7 PREDICTOR VARIABLES FOR PATIENT SAFETY CULTURE

The culture of patient safety survey tool has four outcome variables (*Overall Perception of Patient Safety*, *Frequency of Events Reported*, *Number of Events Reported in the Last 12 Months* and *Patient Safety Grade*). The first two variables (*Overall Perception of Patient Safety* and *Frequency of Events Reported*) were constructed through the summation of scale responses and then divided by the number of items in each dimension. The other two variables (*Number of Events Reported in the Last 12 Months* and *Patient Safety Grade*) were categorical variables and measured as multiple-choice questions.

A multivariate model regression analysis was constructed to examine the effect of respondent and hospital characteristics on the four outcomes variables of the patient safety culture dimensions. The aggregate composite score was regressed against participant characteristics and hospital characteristics.

These variables included gender, age, hospital tenure, professional tenure, education level, nationality, language, working hours per week, monthly income, direct contact with patients, marital status, error reporting awareness, hospital size and accreditation status.

The 95% confidence intervals with a  $p$ -value  $< 0.05$  were considered to have a significant association between variables. Preliminary analyses were conducted to ensure no violations of normality, linearity, multicollinearity, and homoscedasticity. Normality indicates that the residual must be normally distributed around the dependent variable scores. Linearity specifies that the residuals must have a straight-line relationship with the dependent variable scores. Homoscedasticity means that the variance of the residuals related to the dependent variable scores should be the same for all scores.<sup>225</sup> Multicollinearity happens when the independent variables are well-correlated ( $r \geq 0.9$ ).<sup>225</sup>

For the purpose of this analysis, the two outcomes categorical variables (*Number of Events Reported in the last 12 Months* and *Patient Safety Grade*) were recoded as indicated in Table 5.22.

**Table 5.22** Recoding of the Two Outcome Categorical Variables

Value of the outcome categorical variables	Value of the recoded outcome categorical variables
<b>1 Number of Events Reported in the Last 12 Months</b>	
1 = No event reports	0= No event reports
2 = 1 to events reports	1= 1 or more event reports
3 = 3 to 5 events reports	
4 = 6 to 10 events reports	
5 = 11 to 20 events reports	
6 = 21 or more events report	
<b>2 Patient Safety Grade</b>	
1 = Excellent	0= Poor or Failing
2 = Very good	1= Excellent or Very good or
3 = Acceptable	Acceptable
4 = Poor	
5 = Failing	

### 5.7.1 PATIENT SAFETY GRADE PREDICTORS

The binary logistic regression was conducted to examine the likelihood that participants would rank patient safety in their work as excellent, very good or acceptable. The 15 independent variables of participant and hospital characteristics (gender, language, nationality, age, education, awareness of error reporting policy/method, contact with patient, hospital accreditation, hospital size, staff position, hospital tenure, professional tenure, working hours per week, marital status, and monthly income) were regressed against the dependent variable (*Patient Safety Grade*). The independent variables were entered simultaneously as predictor variables (Table 5.23).

**Table 5.23** Predictors of *Patient Safety Grade*

Independents variables		B	Sig	OR	(95% CI)	
Gender	Female	1				
	Male		-0.174	0.713	0.840	0.322 to 2.215
Language	Non-Arabic	1				
	Arabic		0.847	0.061	2.333	0.980 to 5.555
Nationality	Non-Saudi	1				
	Saudi		-0.627	0.229	0.534	0.192 to 1.484
Age	≤33 years	1				
	≥34 years		0.112	0.769	1.118	0.531 to 2.356
Education	≥ Bachelor	1				
	≤High diploma		0.012	0.976	1.012	0.450 to 2.277
Awareness of error reporting policy/method	No	1				
	Yes		0.233	0.588	1.262	0.544 to 2.933
Contact with patient	No	1				
	Yes		0.175	0.648	1.192	0.562 to 2.528
Accreditation	No	1				
	Yes		1.866	< 0.001	6.465	2.899 to 14.421
Hospital Size	Small	1				
	Large		0.021	0.955	1.021	0.499 to 2.087
Staff position	Doctor	-	-	0.689	-	-
	Nurse	1				
	Manager	2				
	Other	3				
Years in hospital	≤5 years	1				
	≥6 years		-0.296	0.433	0.744	0.355 to 1.559
Years in profession	≤10 years	1				
	≥11 years		0.051	0.895	1.053	0.490 to 2.261
Working hours	≤39 h/week	1				
	≥40 h/week		-0.547	0.493	0.579	0.121 to 2.764
Marital status	Not married	1				
	Married		0.183	0.617	1.201	0.586 to 2.460
Monthly income	≤10,000 SAR	1				
	≥10,001 SAR		-0.320	0.459	0.726	0.311 to 1.696

The full model containing all predictors was statistically significant,  $\chi^2 (17, n = 739) = 42.18, p < 0.001$ . The model as a whole explained between 5.5% (R square) and 14.4% (Pseudo-R squared) of the variance.

The hospital accreditation status was the only independent variable that was a statistically significant contributor to the model. The results showed that a one unit increase in hospital accreditation status (in an accredited hospital) resulted in staff being 6.46 times more likely to evaluate the workplace as excellent, very good or acceptable (OR 6.46, 95% CI = 2.89–14.42,  $p = 0.001$ ).

### 5.7.2 NUMBER OF EVENTS REPORTED IN THE PAST 12 MONTHS PREDICTORS

The binary logistic regression was conducted to examine the likelihood that participants would report AEs in their clinical work areas. The 15 independent variables of participant and hospital characteristics (gender, language, nationality, age, education, awareness of error reporting policy/method, contact with patient, hospital accreditation, hospital size, staff position, hospital tenure, professional tenure, working hours per week, marital status, and monthly income) were regressed against the dependent variable (*Number of Events Reported in the Last 12 Months*). The independent variables were entered simultaneously as predictor variables (Table 5.24).

The full model containing all predictors was statistically significant,  $\chi^2 (17, N = 733) = 299.51, p < 0.001$ . The model as a whole explained between 33.5% (R square) and 46.2% (Pseudo-R squared) of the variance.

Nine of the independent variables were statistically significant contributors to the model. The strongest predictors to reporting errors were hospital accreditation status and staff position with an odds ratio of 7.03 and 15.12, respectively. This indicated that respondents who worked in accredited hospitals were more likely to report AEs than those who worked in non-accredited hospitals.

**Table 5.24** Predictors of the *Number of Events Reported in the Last 12 Months*

Independents variables		B	Sig	OR	(95%CI)	
Gender	Female	1	0.068	0.818	1.074	0.599 to 1.915
	Male					
Language	Non-Arabic	1	-0.012	0.968	0.988	0.550 to 1.775
	Arabic					
Nationality	Non-Saudi	1	-0.341	0.332	0.711	0.357 to 1.416
	Saudi					
Age	≤33 years	1	0.777	<b>0.002</b>	2.175	1.337 to 3.539
	≥34 years					
Education	≥ Bachelor	1	-0.029	0.911	0.972	0.586 to 1.612
	≤High diploma					
Awareness of error reporting policy/method	No	1	-0.462	<b>0.049</b>	0.630	0.398 to 0.997
	Yes					
Contact with patient	No	1	0.755	<b>0.003</b>	2.127	1.284 to 3.524
	Yes					
Accreditation	No	1	1.951	<b>&lt; 0.001</b>	7.034	4.535 to 10.910
	Yes					
Hospital Size	Small	1	0.182	0.401	1.200	0.784 to 1.836
	Large					
Staff position	Doctor	-	-	<b>&lt; 0.001</b>	-	-
	Nurse	1	2.717	<0.000	15.129	6.934 to 33.008
	Manager	2	1.699	<0.000	5.470	2.270 to 13.184
	Other	3	2.086	<0.000	8.052	3.682 to 17.609
Years in hospital	≤5 years	1	-1.010	<b>&lt; 0.001</b>	0.364	0.220 to 0.602
	≥6 years					
Years in profession	≤10 years	1	-0.956	<b>&lt; 0.001</b>	0.384	0.240 to 0.616
	≥11 years					
Working hours	≤39 h/week	1	-1.363	<b>0.009</b>	0.256	0.091 to 0.717
	≥40 h/week					
Marital status	Not married	1	0.594	<b>0.010</b>	1.810	1.153 to 2.842
	Married					
Monthly income	≤10,000 SAR	1	0.075	0.797	1.078	0.607 to 1.915
	≥10,001 SAR					

In addition, nurses were more likely to report AEs than doctors, managers and other healthcare providers. Age was also associated with a positive perception of AE reporting. The results showed that a one unit increase in age (being older) resulted in higher odds of AE reporting (OR 2.175, 95% CI = 1.337–3.539,  $p = 0.002$ ). Likewise, respondents who reported direct contact with patients had higher odds of the likelihood to report AEs (OR 2.12, 95% CI = 1.28–3.52,  $p = 0.049$ ) compared to those who had no contact with patients. Interestingly, marital status was a significant contributor in the logistic regression model (OR 1.80, 95% CI = 1.15–2.84,  $p = 0.010$ ) of reporting errors. The results indicated that being married was associated with an increase in the odds of reporting AEs compared to other groups.

All other factors that showed significant effects (working hours, years in same hospital, years in profession, and awareness of error reporting policy/methods) had an OR <1 and therefore had a low associated effect on AE prediction.<sup>252</sup>

### 5.7.3 OVERALL PERCEPTION OF PATIENT SAFETY PREDICTORS

The composite score of the *Overall Perception of Patient Safety* was regressed against the 15 participants and hospital variables (gender, language, nationality, age, education, awareness of error reporting policy/method, contact with patient, hospital accreditation, hospital size, staff position, hospital tenure, professional tenure, working hours per week, marital status, and monthly income) using multiple regressions analysis. The participant and hospital characteristics were used simultaneously as independent variables, and the overall perception of patient safety was used as a dependent or response variable. Table 5.25 shows the findings of the multiple regression analysis.

The multiple regression test indicated that four independent variables were statistical predictors of the positive perception of patient safety. The model explained 8% of the variance (Adjusted  $R^2 = 0.085$ ,  $F(15,775) = 5.821$  and  $p < 0.001$ ). These variables include direct contact with patient, hospital accreditation status, staff position, and working hours.



**Table 5.25** Predictors of the Positive *Overall Perception of Patient Safety*

Predictor Variables	B	SE-B	t	p
Gender	0.142	0.038	0.825	0.409
Language	0.002	<0.000	0.009	0.993
Nationality	-0.392	0.106	-1.780	0.076
Age (years)	-0.013	0.062	-1.413	0.158
Education	0.112	0.068	1.661	0.097
Error reporting awareness	-0.063	0.029	-0.831	0.406
Contact with patient	0.538	0.116	3.132	<b>0.002</b>
Hospital accreditation	0.739	0.202	5.442	<b>&lt;0.000</b>
Hospital size	0.085	0.023	0.628	0.530
Staff position	-0.130	0.093	-2.273	<b>0.023</b>
Hospital tenure	-0.103	0.046	-1.153	0.249
Professional tenure	0.019	0.009	0.202	0.840
Working hours	0.675	0.100	2.834	<b>0.005</b>
Marital status	0.136	0.045	1.171	0.242
Monthly income	-0.040	0.023	-0.436	0.663

Dependent variable: Overall perception of patient safety

#### 5.7.4 FREQUENCY OF EVENTS REPORTED PREDICTORS

The composite score of the *Frequency of Events Reported* was regressed against the 15 participants and hospital variables (gender, language, nationality, age, education, awareness of error reporting policy/method, contact with patient, hospital accreditation, hospital size, staff position, hospital tenure, professional tenure, working hours per week, marital status, and monthly income) using a multiple regressions analysis. The participant and hospital characteristics were used simultaneously as independent variables, and the *Frequency of Events Reported* was used as a response variable. Table 5.26 shows the findings of the multiple regression analysis.

**Table 5.26** Predictors of the *Frequency of Events Reported*

Predictor Variables	B	SE-B	t	p
Gender	0.209	0.047	1.053	0.293
Language	-0.463	0.107	-2.152	<b>0.032</b>
Nationality	0.579	0.130	2.265	<b>0.024</b>
Age (in years)	0.016	0.067	1.553	0.121
Education	-0.052	0.026	-0.651	0.515
Error reporting awareness	-0.176	0.068	-1.998	<b>0.046</b>
Contact with patient	0.363	0.065	1.816	0.070
Hospital accreditation	1.190	0.273	7.550	<b>&lt;0.000</b>
Hospital size	0.739	0.169	4.658	<b>&lt;0.000</b>
Staff position	-0.025	0.015	-0.381	0.703
Hospital tenure	-0.031	0.012	-0.305	0.760
Professional tenure	-0.125	0.049	-1.139	0.255
Working hours	0.205	0.025	0.736	0.462
Marital status	-0.127	0.035	-0.943	0.346
Monthly income	-0.040	0.019	-0.382	0.703

Dependent variable: Frequency of events reported

The multiple regression analysis revealed that five of the independent variables were statistical predictors of the *Frequency of Events Reported* and explained approximately 14% of the variance (Adjusted  $R^2 = 0.138$ ,  $F(15,773) = 9.262$  and  $p < 0.001$ ). These predictors include language spoken by participants, nationality, error reporting awareness, hospital accreditation and hospital size.

## 5.8 SUMMARY

This chapter presented the findings from the quantitative part (Phase I) of the study. The results showed that patient safety culture in public hospitals in the Asir Region, KSA needs to be improved significantly and urgently. The HSOPSC questionnaire was used to collect data in this study. The findings identified several contributors to the weakness of patient safety dimensions. For example, lack of reporting methods, lack of management support, ineffective communication process, lack of teamwork across units, and lack of feedback and communication about errors. The work environment in all hospitals was affected by the fear of blame and punitive response to errors.

Further descriptive and inferential statistics were used to identify the factors affecting patient safety culture. One of the most influential factors was hospital accreditation status. There were significant differences between accredited and non-accredited hospitals relating to patient safety culture.

The study also explored the capacity of demographic and hospital characteristics to predict patient safety culture. The variables of healthcare providers, background providers, the existence of reporting systems, direct contact with patients, staffing, communication openness, feedback and communication about errors, and working hours were significant predictors.

Chapter 6 is the qualitative part (Phase II) of the study, which explores the experiences of healthcare providers and managers on the causes of poor patient safety culture in 15 public hospitals in the Asir Region, KSA.

## CHAPTER 6. QUALITATIVE PHASE FINDINGS

### 6.1 INTRODUCTION

This study aimed to explore and evaluate patient safety culture in 15 public hospitals in the Asir Region, Saudi Arabia using explanatory mixed methods design. This chapter presents the main qualitative findings. It starts with the participant characteristics. The qualitative findings are then presented under the main themes and sub-themes that emerged from the participants' answers to the interview questions. The Phase II findings (Section 4.4) were used to further understand the factors affecting patient safety culture that emerged from Phase I (Section 4.3). In addition, Phase II revealed more subjective information about the participants' perception of patient safety culture in their workplaces.

### 6.2 PARTICIPANT CHARACTERISTICS

The 30 interviewees came from different cultures and backgrounds, and represented different job positions, nationalities, genders, age, and experience (Table 6.1).

Most of the participants were from Saudi Arabia (53%), with the remainder coming from countries such as India, Philippines, Egypt, and Sudan. The interviewees' age and years of experience were diverse.

Most of the participants were aged between 25 and 35, and all were younger than 43. At the time of the interviews, all of the participants had been working in public hospitals from five years or more. The long working experience helped to enrich the data on patient safety culture.

The number of male participants ( $n = 24$ ) was more than the female participants ( $n = 6$ ). This is might due to the gender segregation and cultural issues in the public hospitals. In addition, the number of male managers outweighed the number of female managers at the time of data collection. Nurses represented almost one-third of the sample ( $n = 9$ , 30%), as did allied healthcare providers ( $n = 9$ , 30%), followed by managers ( $n = 7$ , 23%) and doctors ( $n = 5$ , 17%).

The diversity of backgrounds and cultures enabled a more comprehensive understanding of issues that face non-Arabic speaking staff and managers.

**Table 6.1** Participant Characteristics of Interviewees

Participants		Number ( <i>n</i> )	Percentage (%)
<b>Gender</b>	Male	24	80
	Female	6	20
<b>Nationality</b>	Saudi	16	53
	Other nationality	14	47
<b>Job position</b>	Nurse	9	30
	Allied healthcare providers*	9	30
	Manager	7	23
	Physician	5	17
<b>Age group</b>	20 to 29	9	30
	30 to 39	13	43
	40 to 49	8	27

\*Allied healthcare providers include; pharmacists, clinical laboratories and physiotherapists

### 6.3 THE QUALITATIVE FINDINGS

During the interviews, participants were asked some questions (see Table 4.7 in Chapter 4) related to different aspects of patient safety culture to explore their experiences, perceptions, feelings, views and opinions on patient safety issues in their workplaces. These issues and associated questions are detailed in the findings in Phase I of the study.

The results presented in this chapter are based on a thematic analysis of the interview transcripts. The majority of participants spoke Arabic (70%,  $n = 21$ ).

The quoted texts were extracted from the interviews. All participants spoke English as a second language, and the transcripts were maintained in their original form. Therefore, grammatical errors were not corrected in an effort not to distort the original meaning.

Thematic analysis was used to analyse the qualitative data in this study. Four themes and 14 sub-themes emerged (Table 6.2).

The first theme, *management practice*, described the role of management in supporting or affecting patient safety culture in public hospitals. Participants highlighted the effect of management on their work environment, communication difficulties with management, and the lack of appreciation they receive from management. The effect of management on patient safety culture was evident in the participants' descriptions.

The second theme, *work environment*, addressed work-related factors affecting patient safety culture. In this theme, participants talked about working conditions that affected their attitude towards patient safety. For example, staff shortages, lack of resources and long working hours.

The third theme, *patient safety practice and culture*, introduced the types of practices that affected patient safety culture. Participants expressed difficulties that they face in their everyday work that affect safety culture. For instance, lack of reporting systems, lack of communication and feedback, poor patient handoffs and transitions, and lack of teamwork.

The fourth theme, *background differences*, concerned the connection between the participants' background characteristics and their work environment. For example, the effects of gender, nationality, and language and how these act as a barrier in their work environment.

The interviewees talked freely about the issues that influenced patient safety culture in their hospitals.

**Table 6.2** Themes and Sub-themes that Emerged in Phase II

Themes	Sub-themes	Illustrations
1 Management Practices	1.1 Management support	<ul style="list-style-type: none"> <li>• <i>We don't have enough support from the management board</i></li> <li>• <i>We can't ask questions and if we suggest anything, our suggestions are ignored</i></li> <li>• <i>Some managers overlook patient safety issue because they don't know about safety</i></li> <li>• <i>Management support patient safety but it is not a priority and this is the problem</i></li> </ul>
	1.2 Communication with management	<ul style="list-style-type: none"> <li>• <i>We have problem with the management in our hospital, we can't communicate easily with them</i></li> <li>• <i>It is not easy to talk with the hospital managers</i></li> </ul>
	1.3 Lack of appreciation	<ul style="list-style-type: none"> <li>• <i>No one appreciate nurses job</i></li> <li>• <i>Sometimes they appreciate our jobs and sometimes they don't, but nobody know exactly what we are doing</i></li> </ul>
2 Work Environment	2.1 Inadequate resources	<ul style="list-style-type: none"> <li>• <i>We don't have enough staff and therefore we sometime have to work up to six extra hours everyday without any payment</i></li> <li>• <i>The building doesn't support patient safety</i></li> <li>• <i>Also, there security system and security staff is not enough</i></li> </ul>
	2.2 Long working hours	<ul style="list-style-type: none"> <li>• <i>We work for long time every day and also we have staff shortage and the workload is very high</i></li> <li>• <i>If I work for long hours, then I'll not report any errors because I don't have time</i></li> </ul>
3 Patient safety practices & Culture	3.1 Poor AEs reporting system	<ul style="list-style-type: none"> <li>• <i>I haven't seen or heard anything about error reporting methods or policy</i></li> <li>• <i>I have been working here for five years and I don't know about the reporting system</i></li> <li>• <i>We don't have errors system, but we write incident reports and sometimes we don't</i></li> </ul>
	3.2 Ineffective teamwork	<ul style="list-style-type: none"> <li>• <i>It is not easy to work with people from other units</i></li> <li>• <i>We are always busy and we have no time to answer questions or telephone calls from other units</i></li> </ul>
	3.3 Lack of communication	<ul style="list-style-type: none"> <li>• <i>We don't receive any feedback, never</i></li> <li>• <i>There is no communication or report about errors in this hospital</i></li> <li>• <i>We hear people talking about errors in personal way not in formal way</i></li> </ul>

Themes	Sub-themes	Illustrations
	3.4 Lack of patient handoffs & transition	<ul style="list-style-type: none"> <li>• <i>In our hospital we don't have proper handoff procedures. We don't have policy to guide us or help us, there is nothing, it is all about your experience</i></li> </ul>
	3.5 Blame culture	<ul style="list-style-type: none"> <li>• <i>We don't report errors because we are afraid</i></li> <li>• <i>People will blame you if you do a mistake and some people will accuse others for their mistakes and this is the problem, you commit the error and someone else pay for it If you do a mistake they will investigate you and they put a copy of the investigation report in your personal file</i></li> </ul>
	3.6 Punitive response to error	<ul style="list-style-type: none"> <li>• <i>People are afraid of punishment and they will not report errors</i></li> <li>• <i>We are afraid they will cut from our salary if we do mistakes</i></li> <li>• <i>We are interested in patient safety but if someone did a mistake they should be punished</i></li> </ul>
	3.7 Lack of training	<ul style="list-style-type: none"> <li>• <i>Since I joined this hospital I didn't see any training program, I'm working here now for five years</i></li> <li>• <i>We want to improve our procedures and work quality but we don't have enough training</i></li> <li>• <i>Managers needs a lot of training programs to improve their perception towards patient safety</i></li> <li>• <i>We have major problems in our department, and the quality improvement tools are not effectively used, what you hear is different from what you see</i></li> </ul>
4 Cultural and Background Differences	4.1 Personal characteristics	<ul style="list-style-type: none"> <li>• <i>If you don't speak Arabic then you can't communicate effectively with patients and with management and this will eventually affect patient safety</i></li> <li>• <i>You know staff from different nationalities are afraid to lose their job, they will not report error</i></li> <li>• <i>Education will increase staff knowledge about errors and hopefully will increase reporting as well</i></li> <li>• <i>You know our culture, I think female will not report error as much as male, I'm not Saudi and can't speak Arabic, I have a language barrier and can't report errors</i></li> </ul>



## 6.4 MANAGEMENT PRACTICES

This theme reflects the participants' views on management practices and their implications on patient safety culture. It comprises three sub-themes—management support for patient safety, communication with management, and lack of appreciation—that are related to and complement each other to present a holistic understanding of the factors affecting patient safety culture.

### 6.4.1 MANAGEMENT SUPPORT

In the Asir Region, different management levels, types and sections manage the public hospitals, which can result in conflict. Management behaviours and actions are significant factors that affect patient safety culture. The participants acknowledged that management behaviours could affect their perception of patient safety. For example, P1 said:

*“... unfortunately most of the time managers want us to do more job even they overlook patient safety policies to get more job done”.*

In fact, managers themselves admitted that they sometimes overlook patient safety issues. In this regard, P14 stated:

*“ ... sometimes we (managers) overlook minor things that can cause no harm to patients”.*

As a result of such behaviour, the perception of patient safety culture among participants was affected. For example, P6 stated:

*“... top-level managements should understand this, we have problems with the current management staff in this hospital, if the hospital directors don't know patient needs, don't know what is patient safety, how you want them (hospital managers) support these things”.*

Some participants felt that a number of managers were not interested in patient safety. P1 mentioned:

*“... they don't know how to do things related to patient safety, they lack the information and they lack skills ... they really want to do something but they don't know how to do it, and they become not interested in patients safety”.*

P1 was asked about the reasons why managers do not know about patient safety. P1 answered:

*"... simply because they are not trained enough and they are not skilled enough, I think these are the reasons".*

In addition, P1 highlighted the way they do things and the management behaviours towards safety issues:

*"... our work is a reaction to something, so once something happens we will react, also managers will wait until problems happen and then they will try to fix them".*

P1 was requested to further explain the "reaction behaviours" perception, and an example was given as:

*"... if a near-miss error happened when giving medication, we will punish the person and we will not look for the reasons or why or how this happened, once we punish the one who committed the mistake we will not go back to know the reasons".*

Management support for patient safety is critical and should always be maintained. However, a lack of safety support may cause some problems. One form of management support for safety culture is listening to staff suggestions. According to P3:

*"I suggested having a staff meeting [to] discuss what is new and also [to] update all staff about patient safety [however] my suggestion was ignored by the management"*

The lack of management support was evident in a number of interviews. P23 said:

*"... managers may take my suggestion as a compliment only, but this suggestion will not be studied or implemented" [P23 added] "managers always put pressure on us ... sometimes I do night shift and the following day they want me to do morning shift, is that possible? Specially if I had a very busy night in OR, this will negatively affect patient safety, long working hours will affect the whole team working with you".*

#### 6.4.2 COMMUNICATION WITH MANAGEMENT

Effective communication is essential during the interactions that occur between healthcare providers and hospital management. In the absence of effective internal communication, an organisation runs the risk of increasing errors and decreasing the reporting of these errors.<sup>253</sup>

In addition, the findings from Phase I showed that communication was an area for improvement. Therefore, participants were asked about communication openness in their clinical work areas. Most participants expressed concern about the communication methods

in their hospitals, and it was agreed that communication methods between management and healthcare providers needed to improve. Participants confirmed the importance of communication:

P3, *".. I can speak freely with the management [however] even if I talk, nobody will listen or do anything"*.

P5 added *"I'm not allowed to go beyond my supervisor [however] if I write to a higher management level and bypass my supervisors, it will negatively affect me"*.

Open communication with management can increase worker satisfaction and eventually increase their performance.<sup>254</sup> However, many participants underlined that there were many barriers between staff and management. P6 said:

*"... we have requested many things from the management, but the question is that do managers react to my requests? I think no, and unfortunately many workers in our hospital can't speak about patient safety problems, not because someone prevents them, but because they became frustrated and preferred not to talk about anything anymore"*.

P16 also confirmed this issue and stated that: *"no one will listen to us"*.

P23, talked about his negative experience when he was asked about communication with management. P2 mentioned:

*"... we can speak freely, but no one will response to us, sometimes if I critique something that I think it is not good for patients, then I will be investigated"*.

However, P15 had a different experience:

*"every month, there is a head-nurse-staff meeting and every units has meeting, so staff are free to speak what they observe in their units ... there is good communication"*.

Likewise, P24 had a positive experience:

*"... I have no limit at all and I can easily access all management levels"*.

In this sub-theme, interviewees explained their experiences about communication openness with management. Most participants agreed that they need more and effective communication with the management staff in their hospitals.

### 6.4.3 LACK OF APPRECIATION

Participants talked about the lack of appreciation from their management. Many of the healthcare providers felt a lack of appreciation for what they are doing. In fact, most healthcare providers want to feel the satisfaction of being recognised for the work they do. Management appreciation can increase satisfaction, motivation, and adherence to work policies.<sup>255</sup>

However, most participants felt unappreciated when they perform their job according to the patient safety policies and procedures. In this regards, P16 stated:

*“... never they [managers] appreciate us, they don’t know what are we doing here, they don’t now the workload we do, and they don’t even say thank you”.*

In fact, because of their profession, some participants felt they were ignored and not acknowledged.<sup>256</sup> In biomedical ethics, respect is a feeling that is gained from work experience.<sup>256</sup> Participant P1 said that:

*“... management don’t understand nurses jobs and they don’t appreciate anything we do, simply because we are nurses, they don’t respect us”.*

P13 shared a similar experience and said:

*“... most of the time they will not appreciate what we are doing, like we work for 6 or 7 months and we hear nothing, it is frustrating”.*

Lack of appreciation can be a critical risk factor that affects organisational performance as a whole.<sup>257</sup> It is argued that if the workers are not engaged and recognised, then their committed to their organisation will be affected, and it is likely that they will not work at full productive capacity.<sup>257</sup> Success in management includes providing interpersonal trust and acceptance.<sup>258</sup> More importantly, it is the responsibility of management to create this environment in their workplace.<sup>258</sup>

While some factors contribute to such widespread disengagement, it is a safe bet that employee recognition—or more accurately, the lack of it—is a substantive component in this disaffected mix. P4 mentioned that:

*“... to be honest they don’t appreciate us at all, it doesn’t make any difference if you do your job according to patient safety procedures or not, what managers want in this hospital is that they don’t want any patient to complain”.*

P5 also confirmed this perception and said:

*“... no they [managers] don’t appreciate us, this affect me, why should I do extra things, you know there is no difference if I work hard or not”.*

P8 shared a similar experience:

*“... they [managers] don’t appreciate our work and there is no difference if the job is performed according to patient safety procedure or not, at the end of the day, those who work in good way and those who don’t will be treated in the same way”*

One of the managers, P9 said:

*“... in fact hospital management support patient safety ... but priorities changes from time to time, patient safety sometimes is compromised to do something else, our doctors and nurses wasn’t more things, but we think we have enough”.*

However, some participants had positive experiences. P10 said:

*“... recently people are really interested in patient safety ... before there was no or very low interest, but now we can feel that the interest is growing and increasing”.*

Another example was offered by P11:

*“... yes [managers] appreciate us, I’m talking about the new management, previously no one appreciate what we are doing, unfortunately it is like personal thing, I don’t know who comes next and will they appreciate what we are doing or not ... but we will wait and see”.*

These feelings, perceptions, and experiences among healthcare providers suggest that management practices contribute significantly to negative patient safety culture. This theme and its sub-themes show that healthcare providers and managers have a weak relationship. In addition, there are some barriers between healthcare providers and management that negatively affect communication processes.

## 6.5 WORK ENVIRONMENT

The work environment is very important for promoting the culture of patient safety. This phase of the study identified some issues related to this theme, including inadequate resources and long working hours.

### 6.5.1 INADEQUATE RESOURCES

During the interviews, participants identified inadequate resources as of the most significant problem in their workplace, including human and non-human resources. For instance, staff shortages and inappropriate workplaces. Almost all participants agreed that staffing levels were inadequate compared to the workload. Each workplace is associated with different cognitive demands that may be affected by the workload and surrounding work environment.<sup>259</sup> For example, the effect of staffing levels on patient safety and outcomes.

P1 said:

*"... we suffer from staff shortage in our hospitals, I have worked for 15 years now, I can't remember that we had enough staff, we are always understaffed".*

P2 also supported this claim and stated:

*"... there is shortage in nurses and even doctors, you know we have shortage in staff and facilities, even the building of our hospital doesn't support patient safety, it is old building with poor systems".*

In fact, staff shortage is a chronic problem in the healthcare system in KSA. According to P6:

*"... earlier you asked me whether or not staff will report errors, I think staff shortage is one of the reasons why people will not report errors, because they don't have the time to report errors, now at this moment, all hospital beds are fully occupied, in each unit there are 13 to 14 patients, and we have only 1 or 2 nurses in each unit, don't you think this can cause medical errors? Also, do you think staff will report errors?, of course they will not, because some patients need special nursing care, like post-operative nursing care, workload is very high, the number of staff is not enough".*

Equally, P8 mentioned similar problems:

*"... the staff number is very very low, the number of staff is not well-matched with the workload at all, this will increase the pressure on us, in a normal work situation, staff should do x-rays*

*for around 40 patients as a maximum, but in our hospital we do 60 or 70 and sometimes we do for 100 patients, because of workload”.*

P22 confirmed this concern and said:

*“... we have huge shortage in the number of our healthcare providers, we have notified the General Directorate of Health Affairs many times about this problem, and we don’t know why they are not taking any actions, we have shortage in all healthcare specialities”.*

In addition, the infrastructure in some hospitals does not support patient safety. P6 said:

*“... the hospital as a building doesn’t support patient safety in many ways, we don’t have reporting system, we report errors by filling up forms, also the hospital culture and environment are not supporting patient safety, this is a remote and small hospital, we need a big change”.*

In this sub-theme, participants identified staffing levels and infrastructure as barriers to patient safety culture. They indicated their need for support in both human and non-human resources.

#### 6.5.2 LONG WORKING HOURS

Participants talked about the consequences of staff shortages, and how they cope with this problem. The effect of long working hours and shift work in hospitals can result in injuries, disabilities and even deaths of patients.<sup>260</sup>

P10 described the magnitude of the workload in his hospital:

*“... in this hospital, we are very busy 24/7, this strange, I worked in many different hospitals, but this hospital is the busiest one, we work faster even without any request from our supervisors, in fact, this hospital is designed to accommodate 150 patients only, but there are around 300 patients now in this hospital, I think now you can imagine the workload that everyone is doing in here”.*

With such workloads, staff concentration of can be affected and AEs can easily occur. P6 described the methods they followed to overcome the problem with staff shortages:

*“... sometimes staff will work for 16 or more to overcome staff shortage, this is the only way we do, and sometimes medical staff work four or six extra hours per shift, nobody pays them*

*for these extra hours they do, even nobody says thank you, management ignores this issue at all, this is really a big problem in this hospital”.*

P6 shared a similar strategy to overcome staff shortages:

*“... if we have enough staff then there will be no problem, but working long time is a big problem, for example, nurses and lab technicians sometimes they work for 12 or 16 hours per day, this is very long working hours, the low number of staff is not acceptable and will cause a lot of errors, it is not only long working hours, but also the workload is very high”.*

P21 raised a significant issue about the effect of staff shortages and long working hours on patient care:

*“... it is very difficult to work for long shift, for example, in our hospital the pharmacy has to open 24 hours, but the pharmacists work 16 hours per day, you know what! a nurse from ER [emergency room] will cover the remaining 8-hour, can you imagine this, nurses cover the pharmacy and dispense medicine from 11 pm until 7 am, the same thing happens in the laboratory department, actually extraction blood is not the job of nurses, but they enforce us to do it, that’s why there are many problems”.*

P21 added more detail about the nature of nurses’ jobs in small hospitals:

*“... we do 12-hours shift, and then we get only 4 or 5 days off per month, also we do on-call duty during our off days, if you don’t have enough sleep or rest then it will affect your work, right?, sometimes we have to work faster to do more work”.*

P2 has worked in different public hospitals in the Asir Region, and explained the methods usually adopted with staff shortages:

*“... we only increase the number of the working hours, there is nothing else we can do, some colleagues work long shift, long hours, sometimes working on-call hours can be extended to 24 hours, what will happen if you work for long time? a human beings can’t concentrate, and they may fall asleep, they can’t control things, and they will commit mistakes in drug preparation or in anything else, in fact, this is happened with my friends”.*



## 6.6 PATIENT SAFETY PRACTICE AND ORGANISATIONAL CULTURE

Patient safety practices and organisational culture arose as another theme to explain the weakness of patient safety culture in the 15 public hospitals in the Asir Region. This theme has seven sub-themes including the AE reporting system, ineffective teamwork, lack of communication and feedback, lack of patient handoffs and transition process, the culture of blame, punitive response to errors, and lack of training.

### 6.6.1 REPORTING SYSTEMS

Reporting systems are important in all healthcare organisations. Reporting systems can help healthcare providers and managers to correct unsafe practices and adopt new strategies to improve patient safety.<sup>261</sup> However, the lack of an effective error reporting system can significantly affect the culture of patient safety. Participants were asked if they have a systematic method to report errors. According to P1:

*“... yes we have paper-based reporting method, we just submit the paper-based report to the quality department and after that we don’t know about this report, we don’t have good feedback about error reporting”.*

Likewise, P3 confirmed that:

*“... we don’t have obvious systematic method to report errors at all, you know sometime big errors are not reported, and sorry to say that, in my unit, sometimes we talk about errors but we don’t report them, just personal things, but we don’t report errors officially”.*

It is important that healthcare providers know the appropriate methods for reporting AEs. However, P13 shared a different experience with the error reporting system:

*“... most of us in this unit don’t know the correct methods to report errors, who or how or when, I don’t know also if we have a method to report any error at al, really I don’t know [P13, added], most of changes in our unit are not related to any error reports, it is because the supervisors want it that way, the effectiveness of these changes are not evaluated”.*

P17, a manager in a public hospital explained that no evaluation occurred of any changes related to error reports:

*“... we got policies, procedures, reports and everything but the problem is that we are evaluating errors in a wrong way, it should be done as a teamwork with root cause analysis,*

*we should do brain storming, but the problem as, we don't solve errors in this way, we start any error report study by asking what is the problem? and how to solve it? and try to create action plan without monitoring".*

Healthcare awareness about error reporting methods is very important. However, many participants were not informed about the correct methods or system to report errors. P7 said:

*"... I don't know if there is a systematic method or no to report error, but if a mistake is happened then I'll tell my direct supervisors and they will deal with it, I have been working here for three years, no one told me anything about this methods before.*

P16 said that there is a critical problem in the communication process in this hospital:

*"... sometimes you hear people talking about errors, I can speak about patient safety problem but no one will listen, I don't know how to report error until now, I'm here for 5 years and I don't know how to report an error systematically".*

It is clear that the existing reporting methods in public hospitals in the Asir Region have a narrow focus, such as medication-related errors. These reporting system methods should be more comprehensive and inclusive.

#### 6.6.2 TEAMWORK

The concept of teamwork between healthcare providers and managers is a critical component of patient safety culture. Recent evidence shows that effective teamwork between healthcare teams leads to significant gains in patient care and safety.<sup>262,263</sup> However, during the interviews, the teamwork concept emerged as a weak point in safety culture.

According to one of the managers of a small public hospital, P6 said:

*"... in general, the concept of teamwork doesn't exist in this hospital, I think this is due to many reasons and one of these reasons is the weakness of the hospital management to create the concept of teamwork among the staff. There is poor coordination between units in this hospital, staff are cooperate because they are friends, it is personal issue, but there is nothing formal about teamwork, if you don't know your colleague then no teamwork, yes it is personal issue, the administrative hierarchy in this hospital is not clear and nobody knows who does what, this create problems in our working environment".*

P3 shared their teamwork experience:

*“in an emergency cases we need somebody to help right? But our nursing office here I think they don’t know what are we working here, and what are we doing here as staff. I think they don’t know, sorry to say this, in this hospital especially no bone help, I have been working here for 11 years, they don’t know how to do things, and they don’t know how to take care of patients, it is not good experience to work with other units, nobody come to help”.*

P7 also shared a similar experience:

*“... I’m not satisfied with the current level of cooperation and coordination between units in our hospital, but sometime we are very busy and really we can’t help others or work as a team, we don’t have enough staff”.*

Likewise, P23 commented on the teamwork experience across units:

*“... there is no cooperation across units in this hospital and each unit work individually, I can give you some examples for this, we don’t have fixed schedule for our daily work, if you are working here, then you will be surprised that the doctors will just tell you to prepare for an ENT [ear, nose & throat] case, we don’t have a list about the cases, also most of the times we have problems with the laboratory department, if we need blood for example, it takes very long time, they are not cooperative, sometimes we even can’t communicate because of the language barriers”.*

However, a few participants, mainly in larger, accredited hospitals, had a positive experience in relation to teamwork. For example, P18 described the teamwork across units as:

*“... it is very good, sometimes if I’m very busy, other come here and help out, we are now doing 8 hours shift, and medical and surgical wards are nearby, so if we are busy, they will help us and we help them”.*

No doubt, teamwork is very important in the culture of patient safety. In Asir hospitals, this concept has to be improved.

### 6.6.3 COMMUNICATION AND FEEDBACK ABOUT ERRORS

Communication openness and feedback about errors are the most important dimensions of patient safety culture.<sup>264</sup> Throughout the interviews with healthcare providers and managers, ineffective communication emerged as a weakness in the culture of patient safety in most of

the hospitals. For instance, P1 explained the difficulties that medical staff face in the communication process:

*"... I can't meet them [managers], how can we communicate if there are barriers. there is no communication channels, like regular meetings or paper work or internet access, we can't access or communicate with them [managers]"*.

P2 also experienced a similar situation:

*"... we never received any feedback or communication about error, that never happened here, we don't have any accessible reports about errors, it is to some extent confidential and not easy to learn about errors in here"*.

It was important to explore the reasons that affected the communication process between healthcare teams and management.

P5 (a manager in one of the hospitals) was asked about the communication barriers in their hospital:

*"... due to the administrative hierarchy system, we have limited communication, I'm not allowed to go beyond my supervisor, and if I write to a higher level [managerial level], my message will be sent back to my direct supervises, this will negatively affect me from communicating with other"*.

While communication about error can help to minimise the same errors from happening again, some participants did not receive any error reports. P6 said:

*"I never received any report or feedback about errors, I'm sure there are many errors and mistakes, there is no one responsible about errors in this hospital at all, and medical directors in this hospital are responsible about this, but because this is a small hospital no one cares about it"*.

The language barrier was another factor that affected communication effectiveness between healthcare teams. Some healthcare providers and managers cannot communicate effectively in English. Therefore, those who cannot speak English fluently tended to speak their language with others from the same nationality. Nonetheless, they must work as a part of a team that includes staff who cannot speak or understand their language. P18 said:

*“... sometime we have new staff and we can’t help them or communicate with them, they don’t speak Arabic, and they speak little English, we have to look for someone from same nationality to talk with the new staff, it is affect the communication between us and even with our patient, you know sometimes we try to guess the meaning if no one can speak their language, I know it is not safe to do this, but we can’t do much about it ”.*

Communication in healthcare organisations in the Asir Region should be improved, particularly, in small and remote hospitals where the problems are more apparent.

#### 6.6.4 PATIENT HANDOFFS AND TRANSITION PROCESS

Passing the correct information between healthcare providers is an important factor embedded in patient safety culture. Any lack of this dimension may lead to avoidable harm to patients. While interviewing participants, several expressed their dissatisfaction with the patient handoffs and transition process in their hospitals.

P3 shared the patient handoffs and transition process in their hospital, confirming that the information transition process between teams or units is weak:

*“... in this department, there was one nurse wanted to take one patient to OR [operating room], the nurse asked the patient to get ready, but the patient said no, I don’t have any planned operation, the nurse was talking to with wrong patient, the patient refused to go with her to the OR, if the patient didn’t say anything, then the nurse would have been taken him to OR, and in OR nobody will ask the patient anything”.*

P5 shared some of the reasons that lead to the lack of patient handoffs and transition:

*“... there are a lot of errors because correct or important information was not endorsed to others, and that’s why we still have many errors, for example a not qualified staff will transfer one patient from one unit to another or a new staff, sometimes because staff are busy they will send a student with the patient, if you don’t have adequate training and continuous evaluation and monitoring these problems will not stop”.*

P13 explained the extent of the problem in the patient handoffs and transition by saying:

*“... that’s [the error in the handoffs process] become routine things in our unit”.*

P15 gave another reason for the weakness of patient handoffs and transition:

*“... there is language barriers, because sometimes the doctors only interview the patients, and for us we know only basic Arabic and we don't know much, also there are many nurses from different nationalities some of them can't speak or understand English, and we can't speak their language, we can't pass information effectively”.*

The researcher asked about any policies that had been adopted to minimise errors during patient handoffs and transition. P27 said:

*“... we don't have any policy, it is all about the staff experience, experienced staff can work better, also the workload, if you have less number of patients then sure no information will be lost but you have too many patients then a lot of information will be lost”.*

P14 agreed that there was a problem in the patient handoffs and transition process:

*“... information is often lost or not complete or not documented, this is clear thing in our hospital, staff sometimes forget to write down or document information, sometimes they forget important information and will not pass it to the following shift”.*

In this sub-theme, the participants confirmed that patient handoffs and transition process is not safe in many hospitals. They agreed about the importance of implementing safe and effective methods to handoffs patients.

#### 6.6.5 BLAME CULTURE

A blame-free culture plays a major role in reporting errors among staff in a healthcare organisation.<sup>265</sup> However, most participants expressed that the culture in their hospitals does not support patient safety practices. According to P30:

*“... staff feels that their mistakes held against them, and any staff do a mistake should be punished, I know =, because of this many people will not report their mistakes”.*

This concept was widespread among the participants. For instance, P28 (a manager in a large hospital) said:

*“... the management well look at the reasons of errors, and also anyone commit a mistake will be punished according to our policies, a copy of our investigation will be kept in the staff file and records, this is what we are doing here”.*

P16 shared an important experience about the blame culture:

*“...sometimes it is a very small mistake, but it will be maximized or exaggerated, and it will be a mark in your file and even in your life in this hospital [for example], one surgeon was transferred from this hospital to a very remote one because of a very small issue, in this hospital mistakes are always held against us”.*

The concept of staff punishment is rooted in many cultures in Asir Region hospitals. According to P14 (a manager in one of the hospitals):

*“... staff punishment is based on the type of errors, is it near-miss error or sentinel event?, according to Article Number 27 from Health Care Provider Policy Book, every provider commit a mistake should be investigated, however, in our department we evaluate the errors before punishing anyone, like minor errors we just verbally warn the staff, but in sentinel event we can't just do that and the staff should be punished”.*

Another healthcare provider shared a similar experience. According to P13:

*“... usually they [managers] will investigate the staff who did the mistake and then they will punish him or her, the error documentations will be held in his file and no one will investigate the system, people will become afraid from the punishment and they will not report errors all the times”.*

There is an urgent need to explain where and how the responsibility of healthcare providers fits into the “no blame” culture. Blame-free culture should be implemented in each hospital, which will transform the healthcare system to deliver safe and high-quality healthcare and a strong professional ethic associated with accountability.

#### 6.6.6 PUNITIVE RESPONSE TO ERRORS

The goal of the non-punitive response to errors is to promote open error reporting and eventually improve patient safety. The culture of patient safety is founded on a non-punitive response to error and the openness of expression of healthcare providers.<sup>266</sup>

However, the results of this study showed that many participants preferred not to report AEs or mistakes because they were afraid of written-up, investigations and/or punishment. For instance, all participants were asked if they report all errors in their workplace. P10 answered:

*“... I think people will not report all errors, I don't know everyone in here, but I'm sure not all healthcare providers report their errors or mistakes”.*

In fact, the fear of punishment was evident in most of the interviews. P8 said:

*"... no of course they will not report all errors, but they will correct what they can, most of errors in our department can be fixed".*

The absence of reporting methods was another reason for staff not to report errors. P10 stated:

*"if there is no protocol about reporting errors then people will ignore reporting errors, I'm sure staff will not report all errors, and some errors are not reported definitely, many people look at the type of error, if the error is simple, no one will report simple error, they will feel embarrassed to report simple mistake".*

The research tried to explore the reasons that influence the attitude of healthcare providers towards error reporting. P10 highlighted that:

*"... maybe because they are afraid to do so, this is the role of quality and patient safety office in the hospital to find out errors, but unfortunately, we don't have quality and safety office in this hospital".*

P5 also explained why people are not reporting errors:

*"... in general people are not reporting errors because we have different nationalities in this hospital, there are Saudis, Indians, Filipinos, Egyptians and others, each nationality want to be always the best and that's why nobody report errors, also staff are afraid from the administrative punishment and other problems, so most of them will not or prefer not to report errors".*

However, according to P4:

*"... to be honest many errors are not reported, and some people feel shy to report errors".*

P2 shared the same perception about reporting errors:

*"... I think it is related to culture or social reasons, we don't have the culture of reporting errors, it doesn't exists at all, I think this is the main reason, the second reason is that maybe personal relationship and maybe they are afraid from punishment, this may be why staff are not reporting errors".*



Finally, P1 claimed that healthcare providers are afraid of the punitive response to errors and it affects the error reporting level. P1 added further factors that affect error reporting, for example, *“there is no clear and proper communication or proper way to report errors, sometimes staff may feel afraid from reporting errors, and sometimes they think it’s not serious error or mistake”*.

#### 6.6.7 LACK OF TRAINING

In addition to the above factors, another reason which may explain the poor patient safety culture and practice is a lack of training. A lack of training is suggested in results made by a number of participants in the face-to-face interview. P1 stated:

*“there is no training in our hospital, new nurses learn from us only, if we do correct they learn it and if we do wrong the learn it”*.

Interview with healthcare providers showed that the lack of information and training or role model to new healthcare providers has led to poor patient safety practices. According to P13: *“Since I joined this hospital I didn’t see any training program, I’m working here now for five years”*.

The training work environment in healthcare organisations can determine the quality of healthcare and the culture of patient safety.<sup>267</sup> However, when hospitals falls short of standards training and improvement programs, whether because of resource allocation or lack of policies and standards, management shoulder be the responsible for such problem. In fact, lack of training programs shows the continued misunderstanding of the greater effects of the complex health care systems and the work environment factors. Understanding the complexity of the work environment and engaging in strategies to improve its effects is paramount to patient safety culture.

P15 highlight that:

*“Managers need a lot of training programs to improve their perception towards patient safety”*.

The interview findings of this study captured a number of comments that confirm the lack of training of healthcare providers as weakness in the culture of patient safety. Evidence of the influence of training on the culture of patient safety is highlighted in studies carried out amongst family practice residents in the USA.<sup>268</sup> According to the authors, attending patient

safety training program was important for promoting a positive AE reporting attitude and behaviour change among newly graduate trainees.<sup>268</sup>

The differences in the perception of patient safety culture between management staff and healthcare providers was suggested as negative factor that affect patient safety culture. Casebeer and Lewis<sup>269</sup> indicated that patient safety workshops for leaders had a significant impact on their roles in culture of patient safety. Management staff should attend training program and they should perceive AEs as inevitable and occur almost daily in healthcare settings while learning from these AEs will improve patient safety. Improving patient safety culture can be achieved by significant efforts at organisational level and to individual level.<sup>270</sup> However, management should establish patient safety culture as key organisational value.<sup>270</sup>

This study portrayed a generally weak patient safety training programs in public hospitals in Asir Region of KSA. It is important to improve the culture of patient safety culture with support of the healthcare management at all levels.

## **6.7 STAFF CULTURE AND BACKGROUND**

Having staff from different nationalities and backgrounds in the work environment is considered a challenge. People may misunderstand the actions and behaviours of those from a different culture. During the interviews, some factors that affect the rate of error reporting emerged, which were linked to the background variables of healthcare providers. For example, P29 said:

*"... I believe there is strong relationship between errors reporting and the staff nationality, non-Saudi staff will feel afraid to report errors, maybe because it is different country and they are afraid".*

P2 shared similar perception:

*"... I think maybe Saudi staff report more errors than other nationalities, but reporting errors depends on the culture of reporting and patient safety in the organisation, if the management and the organisation give priority for reporting errors then, people will report, but from my own experience, I saw Saudi nurses report more, also education level, I mean if the staff is more educated, I think they will report more".*

Different languages are another factor that affected patient safety culture in public hospitals in the Asir Region. According to P3:

*“I’m from different nationality and dealing with people from other other nationality, sometimes, sorry to say, they don’t understand our language, even it is international language, the communication media should be in English, but many people and patient can’t understand us, also when a new staff is coming, they can’t speak, read or write English, so we have to learn their language to communicate, I think this affects us to report errors because we can’t communicate”.*

P5 worked as a nursing manager in a small hospital and claimed that:

*“language is playing an important role in reporting errors, some staff can’t speak English fluently which affects them from writing or reporting errors, also nationality may affect reporting errors. I noticed that Saudis are not reporting errors as much as other nationalities, non-Saudis staff will report more. I think if you have direct contact with patients then you will report more errors. I really observed that female reported errors more than males. I don’t know why but this is what I have seen here. Nationality may affect reporting, in this hospital we have Filipinos, Indians and Saudis nurses, also we have nurses from Pakistan and Bangladesh, you know different thinking and different culture, probably if both nurses from same nationality they want to help their friends, so if it is a minor error then really they will not report it, and if it is a major error they will try to fix it, but if they can’t then they will report”.*

P21 shared similar thoughts that nationality affects error reporting:

*“... nationality will affect reporting, [on nationality] nurses are more afraid to report errors. I think male do more errors mostly. If Saudi male nurses do errors, only head nurse will report them because they will not report. Language also affect reporting because sometime staff can’t, particularly new staff, understand Arabic very well so it will hinder them reporting because of language barriers. Also working hours, if you work long time it will hinder you from reporting”.*

However, according to P6:

*“... there is a relationship between error reporting and staff culture or background, it depends on the healthcare providers and his or her motivations, I think it is personal and self-motivated issue and if staff feel safe they will report errors”.*

The previous quotes identified the presence of cultural factors on the healthcare providers. In fact, this perception was evident among management staff who deal with different nationalities in different ways.

## **6.8 SUMMARY**

This chapter presents the Phase II (qualitative) findings from 15 public hospitals in the Asir Region, Saudi Arabia. Thirty healthcare providers and managers were interviewed. Most of the participants were nurses and allied healthcare providers, followed by managers and doctors. Some themes and sub-themes emerged from the qualitative data analysis. Conflict was obvious in participants' perception when talking about patient safety culture. Ineffective communication, patient handoffs, teamwork, and punitive response to errors were identified as the main sources of conflict.

In addition, the culture, in its anthropological form, affected work conditions, in that non-Saudi healthcare providers and managers found it difficult to understand, particularly, without sufficient cultural introduction. This effect resulted in a weak patient safety culture.

The next chapter will discuss and integrate the findings from the quantitative and qualitative phases of the research.

## CHAPTER 7. DISCUSSION

### 7.1 INTRODUCTION

This study aimed to evaluate and identify the factors affecting patient safety culture in 15 public hospitals in the Asir Region, KSA. This chapter provides an overview of the study, triangulates the quantitative and qualitative results, and discusses them in the context of the literature. The discussion covers the perceptions of patient safety culture among healthcare providers and managers in 15 public hospitals in the Asir Region, KSA. In addition, it examines how participant and hospital characteristics relate to patient safety culture.

### 7.2 STUDY OVERVIEW

This study adopted a two-phase explanatory sequential mixed method design. The quantitative part (Phase I) was the dominant part of the study. The rationale for using a mixed methods approach was to develop a deeper understanding of the perception of patient safety culture in the public hospitals and the factors affecting this perception. This design enabled the qualitative data (Phase II) to follow and expand on the quantitative findings (Phase I).

In Phase I, the HSOPSC questionnaire was used as a survey tool to collect data. Descriptive and inferential statistics were used to evaluate patient safety culture in a representative stratified random sample ( $n= 1100$ ) of healthcare providers and managers in public hospitals in the Asir Region.

Phase II involved data collection through semi-structured interviews with 30 healthcare providers and managers. The qualitative research questions were developed from the quantitative phase findings.

The objectives of this study were to: (1) evaluate how healthcare providers and managers perceive patient safety culture; (2) evaluate the awareness of healthcare providers and managers on the AE reporting methods in their hospitals; (3) determine differences in the dimensions of patient safety culture between accredited and non-accredited hospitals; (4) investigate any significant relationships between participant and hospital characteristics variables (gender, age, education, language, nationality, working hours, direct contact with

patient, professional tenure, organisational tenure, hospital size, and hospital accreditation) and the four outcome dimensions of patient safety culture; (5) estimate the capacity of the demographic and hospital characteristics to predict the positive perception of patient safety culture dimensions; and (6) present recommendations for healthcare managers and leaders on how to improve the patient safety culture among healthcare providers in public hospitals. Twelve dimensions of patient safety were assessed in this study (Table 7.1).<sup>271</sup>

**Table 7.1** AHRQ Hospital Survey on Patient Safety Culture Composites and Definitions

Patient safety culture composite	Definition: The extent to which
1 Communication Openness	Staff will freely speak up if they see something that may negatively affect patient care, and feel free to question those with more authority
2 Feedback & Communication about Error	Staff are informed about errors that happen, given feedback about changes put in place based on event reports, and discuss ways to prevent errors
3 Frequency of Events Reported	The following types of mistakes are reported: <ul style="list-style-type: none"> <li>• Caught and corrected before affecting the patient</li> <li>• No potential to harm the patient</li> <li>• Could harm the patient, but do not</li> </ul>
4 Handoffs & Transitions	Important patient care information is transferred across hospital units and during shift changes
5 Management Support for Patient Safety	Hospital management provides a work climate that promotes patient safety and shows that patient safety is a top priority
6 Non-punitive Response to Error	Staff feel that their mistakes are not held against them, and mistakes are not kept in their personnel file
7 Organisational Learning–Continuous Improvement	Mistakes have led to positive changes, and changes are evaluated for their effectiveness
8 Overall Perceptions of Patient Safety	Procedures and systems are good at preventing errors, and there is a lack of patient safety problems
9 Staffing	There are enough staff to handle the workload, and work hours are appropriate to provide the best care for patients
10 Supervisor/Manager Expectations & Actions Promoting Safety	Supervisors/managers consider staff suggestions for improving patient safety, praise staff for following patient safety procedures, and do not overlook patient safety problems

Patient safety culture composite	Definition: The extent to which
11 Teamwork across Units	Hospital units cooperate and coordinate with one another to provide the best care for patients
12 Teamwork within Units	Staff support one another, treat each other with respect, and work together as a team

### 7.3 DISCUSSION OF FINDINGS

The main findings that emerged from the two phases of the study (quantitative and qualitative) are discussed in tandem in relation to the available literature and presented according to the research objectives stated earlier.

#### 7.3.1 PERCEPTION OF PATIENT SAFETY CULTURE

Sorra and Nieva<sup>206</sup> categorised patient safety culture into two categories: areas of strength and areas needing improvement. The areas of strength are any survey dimensions of patient safety culture that score 75% or more of the overall mean positive response rate to the positively worded items in the dimension (“strongly agree/agree” or “most of the time/always”, or when 75% or more of the responses disagree with the negatively worded items (“strongly disagree/disagree”). Likewise, areas needing improvement are any survey dimensions of patient safety culture where 50% or more of participants did not answer positively to the positively worded items (“disagree/disagree” or neither) or agreed with the negatively worded items (“strongly agree/agree”).

However, Sorra and Nieva<sup>206</sup> argued that the 75 and 50% cut-offs are to some extent arbitrary and the researcher may select a higher or lower cut-off percentage. In addition, according to the AHRQ criteria, any dimensions with positive response rates between 50 and 75% are not categorised as areas of strength or areas needing improvement. For this study, the cut-off percentage for areas of strength was 60%.

The results of the positive response of the 12 dimensions of patient safety culture showed that only two areas were considered areas of strength; *Teamwork within Units* and *Organisational Learning-Continuous Improvement*. All other areas of patient safety culture were considered as areas needing improvement (Table 7.2).

**Table 7.2** Summary of Positive Responses on the Patient Safety Culture Dimensions

Patient safety culture dimensions Items	Average % of positive responses
<b>Teamwork within Unit</b>	<b>64%</b>
People support one another in this unit	71%
When a lot of work needs to be done quickly, we work together as a team to get the work done	61%
In this unit, people treat each other with respect	70%
When one area in this unit gets really busy, others help out	52%
<b>Organisational Learning–Continuous Improvement</b>	<b>62%</b>
We are actively doing things to improve patient safety	78%
Mistakes have led to positive changes here	54%
After we make changes to improve patient safety, we evaluate their effectiveness	53%
<b>Frequency of Events Reported</b>	<b>45%</b>
When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	47%
When a mistake is made, but has no potential to harm the patient, how often is this reported?	39%
When a mistake is made that could harm the patient, but does not, how often is this reported?	49%
<b>Non-punitive Response to Error</b>	<b>42%</b>
Staff feel like their mistakes are held against them	39%
When an event is reported, it feels like the person is being written up, not the problem	36%
Staff worry that mistakes they make are kept in their personnel file	52%
<b>Feedback &amp; Communication about Error</b>	<b>42%</b>
We are given feedback about changes put into place based on event reports	55%
We are informed about errors that happen in this unit	38%
In this unit, we discuss ways to prevent errors from happening again	32%
<b>Overall Perception of Patient Safety</b>	<b>42%</b>
It is just by chance that more serious mistakes don't happen around here	41%
Patient safety is never sacrificed to get more work done	57%
We have patient safety problems in this unit	38%
Our procedures and systems are good at preventing errors from happening	31%



<b>Patient safety culture dimensions Items</b>	<b>Average % of positive responses</b>
<b>Supervisor/Manager Expectations &amp; Actions Promoting Patient Safety</b>	<b>38%</b>
My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	43%
My supervisor/manager seriously considers staff suggestions for improving patient safety	45%
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	31%
My supervisor/manager overlooks patient safety problems that happen over and over	32%
<b>Management Support for Patient Safety</b>	<b>36%</b>
Hospital management provides a work climate that promotes patient safety	38%
The actions of hospital management show that patient safety is a top priority	47%
Hospital management seems interested in patient safety only after an adverse event happens	21%
<b>Communication Openness</b>	<b>33%</b>
Staff will freely speak up if they see something that may negatively affect patient care	36%
Staff feel free to question the decisions or actions of those with more authority	18%
Staff are afraid to ask questions when something does not seem right	45%
<b>Teamwork across Units</b>	<b>32%</b>
Hospital units do not coordinate well with each other	33%
There is good cooperation among hospital units that need to work together	37%
It is often unpleasant to work with staff from other hospital units	32%
Hospital units work well together to provide the best care for patients	26%
<b>Handoffs &amp; Transitions</b>	<b>26%</b>
Things “fall between the cracks” when transferring patients from one unit to another	21%
Important patient care information is often lost during shift changes	22%
Problems often occur in the exchange of information across hospital units	26%
Shift changes are problematic for patients in this hospital	36%
<b>Staffing</b>	<b>24%</b>
We have enough staff to handle the workload	19%
Staff in this unit work longer hours than is best for patient care	26%
We use more agency/temporary staff than is best for patient care	28%
We work in “crisis mode” trying to do too much, too quickly	25%

### 7.3.1.1 Areas of Strength

The *Teamwork within Units* dimension of patient safety culture was considered the highest area of strength in patient safety culture. Almost two-thirds (64%) of participants had a positive perception of teamwork within their units. This result is comparable with other studies,<sup>92,94,96</sup> which indicates that *Teamwork within Units* is an area of strength in patient safety culture. Various factors may have contributed to this finding. For example, the respect that participants receive in their workplaces may have supported their positive perception of teamwork among participants. Long<sup>272</sup> claims that respect for others is deeply rooted in Arabian culture in general. In this study, 70.3% of the respondents agreed that they “treat each other with respect”.

In addition, the level of cooperation between staff within their work units may have had a positive impact on the perception of patient safety culture. According to P2, “*there is good cooperation in our unit, particularly with high workload or if something happened, my friends will come and help me, we cooperate with each other in our unit*”. In addition, 70.6% of respondents claimed that they support “one another in this unit”.

The hospital’s size may have contributed to the positive perception of *Teamwork within Units*. In this regard, P16 said; “*this is a small town and small hospital, so most of us live close to our hospital, we also know each others, we become friends and I can call anyone to come and help me, they will come*”.

While the staff’s perception of the *Teamwork within Units* dimension in patient safety culture was positive, strengthening teamwork overall requires a supportive system to embed this concept in the organisational culture. This may be achieved by management support and continuous follow-up and improvement in relation to errors.

The second area of strength in patient safety culture was in *Organisational Learning–Continuous Improvement*. This safety dimension had a positive response rate of 62%. Previous studies<sup>92,96,99</sup> also suggested that *Organisational Learning–Continuous Improvement* is an important dimension of patient safety culture. The most influential factor in this dimension was the staff perception of their role in improving patient safety with 78% of respondents agreeing that they “actively do things to improve patient safety”.

One item within this dimension was not seen as influential in improving patient safety. Nearly half (47%) of participants disagreed with the item “after we make changes to improve patient safety, we evaluate their effectiveness”. As patient safety is based on learning from errors and evaluating any changes so that AEs can be avoided in the future, this is an important item in the learning culture. According to P3, “doctors only can update or change things here, then that is it, nobody can do anything and no evaluation at all, we don’t have monthly meeting with management or doctors, so we can’t evaluate anything”. P1, said, “it is written and documented, but it is only on paper and not in our actual work, we don’t evaluate any changes”. Likewise, P16 stated “we can’t change anything, you know only boss can do or ask for change” while P17 said “changes here are always taken by the managers, we clinicians can’t changes things”. So overall, the *Organisational Learning–Continuous Improvement* dimension was considered an area of strength in patient safety culture. However, participants had negative perceptions of how changes to patient safety strategies were effected in their workplaces.

#### 7.3.1.2 Areas for Improvement

In addition to detecting areas of strength in patient safety culture, this thesis was also concerned with the evaluation of patient safety culture to detect any weaknesses. While *Teamwork within Units* and *Organisational Learning–Continuous Improvement* were important factors for maintaining an effective patient safety culture, the remaining 10 areas of patient safety culture were considered as areas for improvement.

#### Frequency of Events Reported

The overall positive response rate in the dimension *Frequency of Events Reported* was 45%, much lower than the positive response rate observed in studies from developed countries<sup>273-277</sup> but consistent with other studies in developing countries,<sup>105,122,278,279</sup> which also indicated the need for improvement in this area. Healthcare providers and managers should report all types of AEs freely and without any constraints. However, the study findings indicate that the participants were not reporting all types of errors.

It is important to investigate the trend of responses across the items within this dimension to understand the participants’ perception of the *Frequency of Events Reported*. Almost one-third of the respondents (29%) would not report their mistakes if they happened. If the errors

had no potential for harm to the patient, then 34% of the respondents indicated that they would not report them, while 26% would “sometimes” report this form of error. More importantly, when actual harm could occur as a result of the AEs, only 49% of the respondents would report AEs, 23% would never report AEs, and 28% would report AEs “sometimes”.

Organisational culture, work and staff characteristics may contribute to the poor rates of AE reporting. One of the factors that might affect the *Frequency of Events Reported* is the blame culture. The qualitative findings of this study reaffirmed the importance of a blame-free culture to the perception of error reporting. According to P2 “... *staff are afraid to report errors, because other staff and the management will blame them for these errors, or they will cut from my salary or even terminate my contract*”. In line with this view, P3 said “... *sometimes big errors are not reported, because we feel shy from others, we don’t want others to blame us*”.

Another factor that affected the *Frequency of Events Reported* is the non-punitive response to error. P5 said “... *staff are afraid from punishment if they do something wrong, staff are always blamed not the system, so staff will not report errors*”.

The staff characteristics, such as the nationality of the healthcare providers or managers and nature of their work, were significantly associated with responses to the *Frequency of Events Reported* dimension. The healthcare providers and managers from Saudi Arabia had higher positive mean scores for *Frequency of Events Reported* ( $M = 7.55, SD = 2.15$ ) compared to other nationalities ( $M = 7.22, SD = 2.20$ ),  $t(1059) = -2.42, p = 0.015$ ). This may be due to language barriers, cultural differences, or the lack of support from local staff.

Other factors associated with the *Frequency of Events Reported* dimension were the hospital’s size and accreditation status. Staff in large hospitals were more positively oriented to reporting all types of errors compared to staff in smaller hospitals. Similarly, staff in accredited hospitals were more open to reporting all types of AEs compared to smaller hospitals. This suggests a failure in the management of smaller and non-accredited hospitals to create an effective patient safety culture.

Direct contact with patients was another factor associated with the *Frequency of Events Reported* dimension ( $t(1055) = -2.35, p = 0.024$ ) in this study. Although very few studies have explored the relationship between direct contact with patients and the frequency of events

reported, patients could be a source of AE reports, stimulating staff to report more errors. In this way, direct communication between staff and patients could improve the rate of error reporting.

#### Non-Punitive Response to Error

The *Non-Punitive Response to Error* dimension was also an area for improvement in public hospitals with an overall positive response rate of 49%. The interview findings supported the quantitative results confirming that respondents perceived a punitive response and blame culture for failing to report AEs. These cultural barriers have also been observed in other healthcare settings in different countries<sup>92,96,111,280-283</sup>, with studies also showing that healthcare providers and managers have negative perceptions in the *Non-Punitive Response to Error* dimension.

The findings of the present study suggest that the current organisational culture in the public hospitals assessed does not support openness of AE reporting and participants were afraid to report AEs. Over half of the participants (52%) agreed that “mistakes they make are kept in their personnel file”, 41% of “staff feel like their mistakes are held against them”, and 45% felt “like the person is being written up, not the problem”. As a result, participants tended to avoid reporting AEs to escape any punitive consequences.<sup>92</sup>

The results also showed that managers were mostly concerned with how to punish staff when a mistake happens. According to P12, “if any error happen the we should punish the person who did this error”. These managers were not aware of the importance of anonymous reporting of errors and had little or no knowledge of patient safety culture or how to create it in their organisations.

This finding may be linked to staff’s fear of punishment, fear of job loss, fear of blame, fear of reprisal for unintentional mistakes, fear of professional shame, or leaders’ perception of medical errors. All of these reasons have been documented in the literature.<sup>122,280,283-285</sup> The results of these studies suggested that the organisational culture creates a fear of reporting AEs among staff in the Asir Region healthcare system.

The culture of patient safety could be improved when leaders make it their top priority.<sup>104</sup> Competent and thoughtful leaders can contribute to improving patient safety and organisational culture. However, leaders should be educated to understand that systematic

flaws may exist, and in each step of the healthcare process there is the potential for failure. Such failure must be seen as a learning opportunity rather than an individual mistake requiring punitive action.<sup>286,287</sup>

In addition, at all levels of management, strategic plans should be put in place to create a blame-free culture to encourage staff to report AEs freely, without fear. These policies should also include a clear definition of AEs and an accessible and anonymous reporting system.

As patient safety culture in public hospitals in the Asir Region currently falls below national and international benchmarks, effective and comprehensive improvements are urgently needed in all areas of patient safety culture. Leape<sup>288(p4)</sup> suggested six major changes to begin the change in safety culture in this Region:

1. Move from secrecy to transparency.
2. Move from considering AEs as individual failures to realising they result in system failures.
3. Move from a punitive culture to a just culture.
4. Change the healthcare models from reliance on independent and individual to interdependent, collaborative and teamwork.
5. Consider accountability as universal and reciprocal, not top-down.
6. Change healthcare from being provider-centred to patient-centred.

#### Feedback & Communication About Error

The *Feedback & Communication About Error* dimension evaluated the extent to which healthcare providers and managers felt informed about AEs occurring in the hospital. The survey results showed that the overall positive response rate was 42%. Most respondents reported a lack of feedback about AEs in their units. This sense that AE feedback was not valued was linked with cynicism about the usefulness of this feedback.

Improving communication about errors in healthcare organisations could positively influence employees to report AEs and affect constructive responses to AEs. According to Benn,<sup>128</sup> active responses and feedback from hospital management about AEs is a key factor which reinforces the sense among employers that AE reports are important for improving patient safety.

In addition to negative perception of AE feedback, the interview findings corresponded with other similar studies that have shown that hospital managers tend to be reactive to AEs rather

than proactive and were not concerned about patient safety until errors had occurred.<sup>289</sup> Ineffective communication and a lack of feedback about AEs can be a major risk for health and patient safety.<sup>140,141,143</sup>

The lack of communication about AEs in public hospitals in the Asir Region could result from the absence of an effective management role in the hospitals and suggest an urgent need for staff and managers in Asir hospitals to strengthen feedback and communication about AEs. Provision of feedback to staff about AEs may also be significant, as it may encourage ongoing AE reporting.

#### Overall Perception of Patient Safety

One of the key objectives of this study was to evaluate the overall perception of patient safety culture among healthcare providers and managers. The survey results for the *Overall Perception of Patient Safety* dimension suggests this area requires considerable improvement in public hospitals in the Asir Region. The overall positive response rate to this dimension was only 42%, which is congruent with the findings of previous studies.<sup>105,122,280,284,290</sup>

This overall negative perception of patient safety in the survey data was supported by the qualitative data. For example, P15 said: *"We need to improve the culture of patient safety in our hospital, there are so many issues and problems if we are talking about patient safety, we don't have error reporting system, we also work hard to do more job, this is small hospital and managers should look after these problems, we have problem in patient safety and in other things related to safety in general, like building safety, you know these things are related to patient safety and also our safety as staff"*.

These results suggest that the systems and procedures in the public hospitals are not adequate at preventing AEs from happening and result in patient safety problems. Other studies conducted in developing countries<sup>122,280</sup> reflecting the poor state of patient safety practices in the Arabic medical context and the urgent need for interventions to improve patient safety practices. Indeed, poor safety practice is considered a serious problem in hospitals in developing countries.<sup>291</sup> Therefore, health leaders should consider patient safety as a priority in these hospitals.<sup>11</sup>

One of the main factors affecting patient safety culture is the absence of effective systems and procedures. Weaver et al.<sup>292</sup> reviewed 33 studies of intervention and concluded that

improving patient safety culture is best conceptualised as a constellation of interventions rooted in principles of leadership, teamwork, and behavioural change, rather than a specific process, team, or technology.<sup>292</sup> Weiling<sup>293,294</sup> also found that a reduction in AEs can be achieved by strategically building defences, barriers, and safeguards into the facility, technology, processes, and equipment of the healthcare system. In the Asir Region, standardisation of processes in all public hospitals may have a significant impact on overall perception of patient safety. Standardisation has been documented as vital for human factor design as it helps to reduce dependence on short-term memory and enable those unfamiliar with a given process to adopt them safely and efficiently. Most work on human factor design focuses on improving the human–system interface by designing better systems and processes.<sup>294</sup>

#### Supervisor/Manager Expectations & Actions Promoting Patient Safety

The overall positive response to the *Supervisor/Manager Expectations & Actions Promoting Patient Safety* dimension was 38%, which is similar to positive response rate reported in other studies.<sup>283,284,295-297</sup> This dimension evaluates the attitude of management towards patient safety culture.

The results from the interview phase showed that participants felt that their management staff did not manage patient risk adequately, and there was a lack of safety systems in their hospitals. Most of the study participants claimed that hospital management only tended to react after a patient safety problem had occurred. Similar problems in management behaviours have been documented in other Arabian countries. In the Libyan healthcare system, for example, the health system is managed with a crisis approach rather than a risk management approach,<sup>298</sup> and this is thought to be a weakness of their system.

Leaders commitment to patient safety in hospitals is crucial especially in hospitals where the decision-making is controlled by top level management like hospitals in the Asir Region. Management can play a vital role in affecting significant reforms in safety culture and in providing expertise, training and necessary resources. These are the fundamental factors for the success of a patient safety program as latent conditions typically arise from decisions made by management and decision makers.



In this study, over 40% of the survey responses indicated that “*managers overlooks patient safety problems that happen over and over*” and “*managers want us to work faster, even if it means taking shortcuts*”. These findings suggest that the management had a negative impact on patient safety culture and the staff perceptions were influenced by this management style. Suggestions to improve this dimension include providing an educational program for management members, standardisation of procedures in all public hospitals in the Asir Region, improving staffing levels in small and remote hospitals, and improving communication between management and healthcare providers.<sup>299</sup>

#### Communication Openness

*Communication Openness* is another area that could be improved in patient safety culture in Asir public hospitals. The results from this dimension indicate that staff were not able to speak or ask questions freely. Ineffective communication is considered a critical problem in patient safety culture as it is involved in every aspect of healthcare such as teamwork, handoffs and transition, leadership, and continuity of healthcare. The survey results revealed that the overall positive response rate in the *Communication Openness* dimension was 33%. While the result is comparable to other studies from different healthcare settings,<sup>122,278,281,296,300,301</sup> communication problems are more obvious in hospitals with complex social and cultural environments, such as the public hospitals in the Asir Region. Interviewees in the second phase of this study raised similar concerns related to communication, indicating difficulty in being understood and feeling isolated. P3 said “*sometimes we feel free to talk, but even if we talk, nobody will do anything, you know I’m foreigner here, even I can’t speak Arabic fluently, this prevents me talking openly and freely*”.

The results of this study suggest the communication gap in healthcare organisations has not improved in recent years, as the findings are mirrored in the findings of studies conducted as long as two decades ago.<sup>302-304</sup>

Communication in clinical areas is consistently the most frequent contributor to AEs and sentinel events reported to the Joint Commission.<sup>305</sup> Sentinel events are vital, serious and harmful of events related to patient safety and are of high priority for intervention and improvement.<sup>306</sup> Joint Commission is an independent, not-for-profit organisation in USA. It

evaluates organisation performance against certain standards.<sup>307</sup> It is a symbol for accreditation and quality of healthcare services.<sup>307</sup>

Communication problems have been associated with patient safety risks for both children and adults since the early 1990s. In 1993, an Australian study of AEs showed that 70–80% of unwanted medical errors were associated with faulty communication.<sup>308</sup> Another Australian study linked communication failures to 25–41% of serious medical events from 2004 to 2005.<sup>309</sup> A retrospective review of 14,000 in-hospital deaths in Australia found communication failure was the leading cause of death twice as frequent as errors related to inadequate clinical skills. Moreover, almost half of all AEs in a study of primary care physicians were connected to communication problems.<sup>310</sup>

In a Canadian study of AEs, communication issues under ‘systemic causes’ related to communication accounted for a substantial number of AEs.<sup>311</sup>

Ineffective communication between healthcare providers, teams and patients within healthcare settings in the Asir Region could be due to several factors. For example, the absence of formal communication policies and failure to include simple and effective communication tools. Another possible factor is that communication in English as a second language has implications for employees and patient safety. Finally, semantic differences in culture, expressions and accents may lead to misunderstandings that ultimately affect safety. Staff speaking English as a second language may be reluctant to admit not understanding a task or instructions to avoid embarrassment.

The findings of this study reinforce the points discussed earlier, that the lack of communication in healthcare settings could lead to unsafe practices, behaviours, violation of roles, and under-reporting of AEs, which may affect patient safety. Good, effective and clear communication between healthcare providers, teams, managers, and patients is required to maintain the quality of work and, ultimately, patient safety.

#### Handoffs & Transitions

Lack of communication in was also evident in the participants’ responses to the *Handoffs & Transitions* dimension. The survey results showed that the overall positive response rate in the dimension was 26%. It was the second lowest positive response rate in patient safety culture in this study and lower than the average response rate revealed from other

studies.<sup>92,96,109,111,122,280,312</sup> This dimension evaluates the quality of patient care information exchange between healthcare providers, healthcare teams and hospital units.

The survey result can be interpreted as an inappropriate and unsafe patient handoff and transition process in public hospitals in the Asir Region. As many as 57% of participants experienced problems when transferring patients from one unit to another. Likewise, 50% of participants had problems in the exchange of information across hospital units. The WHO reported that patient safety problems and AEs could occur in hospitals as a result of ineffective communication during the transfer process of patients from one unit to another or between healthcare providers.

The interview findings reinforced the survey findings and identified significant factors that affected the quality of handoffs and transitions. For instance, the lack of staff commitment to the guidelines of the handoff and transition process, even when a policy was in place in a particular department. It was evident from the interviews that there was a lack of compliance at the time of patient handoffs and transition. Most participants tended to depend on their memory or very short notes about patients during the patient information exchange process. Another factor that had a negative impact on *Handoffs & Transitions* was the different cultures and languages among healthcare providers. Participants preferred to speak their native language during the patient care information exchange process. According to P7, *“sometime I can’t understand my colleagues when they talk, some of them have thick accent, I really like to speak in my language because I feel shy to keep ask others what they say or talk about”*.

The result of the current study indicated that handoffs and transition procedures were conducted informally and were often inconsistent without any standardised documentation. This lack of standardisation could have a negative effect on patient safety in public hospitals in the Asir Region as important information about patient care may be lost, increasing the likelihood of AEs occurring. Nagpal et al.<sup>151</sup> and Siemsen et al.<sup>149</sup> have shown that the absence of formal methods for handoffs and transition in hospitals can lead to negative effects on patient safety as a result of communication problems.

For public hospitals in the Asir Region to have safer handoffs and transition processes, management would need to implement formal handoffs policies and standardised forms and instruments for application within and between hospital units. This would improve the

effectiveness of the communication process between healthcare providers, teams and hospital units.<sup>4,155</sup> For example, the use of ISBAR (Introduction, Situation, Background Assessment, Recommendation) in patient handoffs or transition across hospital units. ISBAR is a standardised framework to improve the communication effectiveness in any situation within healthcare.<sup>313</sup>

### Staffing

The *Staffing* dimension was another area that was identified as requiring improvement in the culture of patient safety in the Asir Region public hospitals. This dimension had the lowest overall positive response rate of 24% and is consistent with many other studies showing that staffing levels are a common problem.<sup>96,280,314</sup> In this study, the survey results showed that 71% of participants agreed that they do not “have enough staff to handle the workload”, 49% of participants worked longer hours “than is best for patient care”, and 52% indicated that they “work in crisis mode trying to do too much, too quickly”. A critical shortage in staffing levels leads to heavier workloads, which further heightens concerns about the adequacy of staffing levels in public hospitals. Staff shortages could be critical for patients in terms of delay in providing healthcare services that could be life-threatening, particularly in emergencies. The interviewees indicated that staffing shortages forced them to take shortcuts in patient safety procedures. This finding corresponds with other studies such as that conducted by Al-Kandari and Thomas<sup>171</sup> and Al-Ahmadi.<sup>99</sup> Both studies used surveys to assess the perception of safety culture in hospitals among staff in Kuwait and Saudi Arabia. These studies established a significant correlation between staffing levels and the number of AEs.

Findings from Phase II of this study also showed that the staffing levels in the 15 public hospitals in the Asir Region was low compared to staff workloads. This could be the result of an unbalanced distribution of human resources across these hospitals. Staff who come from different countries are often sent, against their will, to remote and isolated areas. This situation frustrated the staff in terms of achieving their duties, which may lead to patients not receiving adequate, safe and proper healthcare.

Furthermore, findings from the interviews identified significant challenges that may lead the unbalanced distribution of healthcare staff in Asir public hospitals. For instance, the social and cultural context in the remote and isolated areas restrained the ability of health managers to recruit and maintain staff in these areas. This concern was reflected in the qualitative data,

where respondents expressed their intention to quit their job if they were not transferred to a larger city or hospital.

The imbalance in staffing is a common concern across different countries worldwide, and it is known to affect the quality of healthcare services in hospitals and other health environments.<sup>315</sup> According to P11, *“we have to work longer hours, because we have no staff, the workload is too much, management do nothing to help us, really workload affect us and affect patient safety”*.

Health managers and leaders in the Asir Region may need to improve staffing levels in public hospitals to improve patient safety. Different management actions could be adopted to improve staffing levels. For example, incentives could be offered to healthcare providers to work in small and remote hospitals, staff could be rotated between hospitals every few months, and recruitment and retention policies and procedures could be improved.

### 7.3.2 STAFF AWARENESS OF AE REPORTING METHODS

One of the objectives of this study was to evaluate the awareness of respondents to AE reporting methods and policies in their clinical areas. The findings indicated a significant lack of participant awareness of AE reporting methods and related policies. There is no prior research on the awareness of healthcare providers and managers about AE reporting methods and policies in KSA to compare the findings of the current study.

In both phases of this study, participants were asked if they “have a policy that explains the process and methods of AE reporting in their hospitals”. The survey results showed that only 26% of respondents were aware of AE reporting methods and AE-related policies in their hospital. However, 43%% of the respondents were not aware of either AE reporting policies or methods, while 28% indicated that they do not have AE reporting policies or methods in their hospitals. When the proportion of participants who were not aware of AE reporting methods or policies was calculated, the accumulative percentage showed that 71% of the respondents in this study were not aware of AE reporting methods or their related policies. The interview with participants confirmed these findings. Most interviewees felt there were no reporting methods or policies in their hospitals. According to P16 *“we don’t have error reporting system, nothing at all, we have no policies here, we don’t have system to follow and no events reports”*. P16 then added *“no official reports, sometimes we hear people talk about*

*errors, but it is personal not official*". P13 also said, *"we have no systematic method to report errors, most of us in this unit don't know the correct methods to report errors, who or how or when, I don't know also if we have a method to report any error, really I don't know"*. Other interviewees were aware of reporting methods and policies such as P17 who stated that *"In case of small errors we write OVR [Occurrence Variance Reporting] and in case of sentinel events we use computer to report to MOH in the capital city"*. Interestingly, some interviewees were aware of reporting methods but had not used them. For example, P23 stated, *"I heard that there is a system, but to be honest I don't know how to report any errors"*.

Overall the findings of this study indicated a significant lack of awareness among respondents towards AE reporting methods and policies. This lack of knowledge can lead to under-reporting of AEs and poor patient safety culture.<sup>316</sup>

One possible factor that may affect respondent awareness of reporting methods and policies is the lack of training and improvement programs. Efforts to improve patient safety culture should include orientation and training programs, mainly for new staff, that explain the methods and policies related to AE reporting.

A further factor that may affect the awareness of AE reporting is the absence of a systematic method of AE reporting. While AE reporting methods were described by interviewees, the reporting methods were not standardised across the public hospitals in the Asir Region. A standardised method of reporting could increase the awareness of staff of AE reporting methods, especially when employees transfer from one hospital to another. One type of AE reporting is the Medical Team Management (MTM). According to Woolever,<sup>317</sup> the implementation of MTM in a hospital in the USA showed positive changes to the patterns of AE reporting, significantly increasing reporting of AEs and AE near misses. The use of new technology may also improve AEs reporting methods by providing more comprehensive information including AE rate, drug use and patient outcomes. For instance, the Health Department in Western Australia use Data Linkage Software to access comprehensive information and data about patients.<sup>318</sup> Adopting similar software would help healthcare providers and managers in the Asir Region to evaluate medical care and conduct epidemiological studies not only in AEs but also for cancer, heart diseases and other health problems. More importantly, the software may offer a national platform for a standardised method of data collection about patients throughout hospitals in the KSA.

### 7.3.3 DIFFERENCES BETWEEN ACCREDITED AND NON-ACCREDITED HOSPITALS IN PATIENT SAFETY DIMENSIONS

This study included eight non-accredited hospitals (three large and five small) and seven accredited hospitals (four large and three small). One of the objectives of the study was to identify the differences in patient safety culture dimensions based on hospital accreditation status. Table 5.17 in Chapter 5 shows the differences in patient safety dimensions between public hospitals based on accreditation status.

In general, participants in accredited hospitals had more positive responses on the dimensions of safety culture compared to participants in non-accredited hospitals. This finding is in line with other studies conducted in neighbouring countries.<sup>94,109,314</sup>

One of the differences between accredited and non-accredited hospitals was observed in the areas of strength. No areas of strength were identified in the non-accredited hospitals compared with two areas in the accredited hospitals. All the other patient safety dimensions were considered areas for improvement in all hospitals.

Other differences between accredited and non-accredited hospitals were observed in the *Teamwork across Units* and *Handoffs & Transitions* dimensions. In non-accredited hospitals, respondents had a slightly higher positive responses rate in these two dimensions. This is may be due to hospital size (five small, non-accredited hospitals versus three small, accredited hospitals), with staff in smaller the hospitals tending to know each other better and work together more effectively. A further factor that may contribute to these findings is the workload. Smaller hospitals usually treat simple and minor cases, whereas critically ill patients are often transferred to larger hospitals.

Additional differences were observed in the AE reporting rate and the overall *Patient Safety Grade*. Participants in accredited hospitals had a more positive perception of the *Number of Events Reported in the Last 12 Months* and *Patient Safety Grade*, which may be due to differences in infrastructure, resources, and staffing levels. In addition, participants in accredited hospitals indicated that they had a systematic method of reporting AEs while those in non-accredited hospitals did not.

A final difference was identified in participant awareness of the methods and policies relating to AE reporting. In accredited hospitals, 34.% of respondents agreed that they have AE

reporting policies and methods, 19% answered that they do not have policies or systematic methods to report AEs, and 47% were not aware of and AE reporting policies or methods. In non-accredited hospitals, only 15% of respondents agreed that they have AE reporting policies and methods, 42% indicated that there were no policies or methods to report AEs, while 38% were not sure if they had AE reporting policies or methods. Under-reporting and the awareness of the correct methods and policies to report AEs are known to be linked. According to Jahromi, Parandavar, and Rahmanian,<sup>319</sup> lack of knowledge of error reporting methods is one of the most important factors contributing to non-reporting AEs and also an indicator of poor patient safety culture. This suggests patient safety improvements will only occur in hospitals where preventive methods are considered after AEs are reported and analysed.

It should be noted that, however, the characteristics of the accredited hospitals in this study differ significantly from the non-accredited hospitals. Thus, differences between accredited and non-accredited hospitals in relation to patient safety culture cannot be linked exclusively to hospital accreditation status because there are other factors that may explain these differences. In future studies, where hospital characteristics are similar, but accredited hospitals show better findings on the dimensions of patient safety culture than non-accredited hospitals, then the improvements in patient safety practices and patient outcomes could be linked mainly to hospital accreditation initiatives.

Overall, this study suggests that improvements are required in both accredited and non-accredited hospitals to further improve patient safety culture.

#### *7.3.4 FACTORS AFFECTING THE FOUR OUTCOME DIMENSIONS OF PATIENT SAFETY CULTURE*

The fourth objective of the current study was to investigate the relationship between participant and hospital staff characteristics (gender, age, education, language, nationality, working hours, direct contact with patients, professional tenure, organisational tenure, hospital size, and hospital accreditation) and the dimensions of patient safety culture. To fulfil this objective, three steps were taken, which are discussed in the following paragraphs.

##### *7.3.4.1 Step 1: Correlations between the Dimensions of Patient Safety Culture*

A matrix of Pearson's ( $r$ ) correlation coefficients was generated to investigate the correlations between the dimensions of patient safety culture. A few correlations varied in direction and strength. Significant negative correlations were observed between *Teamwork within Units*



and *Non-punitive Response to Error, Supervisor/Manager Expectations & Actions Promoting Patient Safety* and *Handoffs & Transitions*, and *Feedback & Communication about Error* and *Non-punitive Response to Error*. Correlations coefficients of 0.1 were considered small, 0.3 moderate and 0.5 or above large<sup>251</sup> (see Table 5.18 in Chapter 5 for more detail). Only correlations  $\geq 0.3$  are discussed.

The *Overall Perception of Patient Safety* was positively correlated with *Frequency of Events Reported*, *Organisational Learning–Continuous Improvement* and *Non-punitive Response to Error*. This suggests a positive perception of patient safety will improve both the AE reporting rate and the organisational learning environment. In addition, the response to errors will be more positive. Overall, this highlights the importance of *Overall Perception of Patient Safety* in patient safety culture. Previous studies of patient safety culture have also found that positive perceptions of patient safety can improve staff attitudes to AE reporting, support a blame-free culture, and enhance the learning culture in healthcare organisations.<sup>278,279,320-322</sup> In the present study, the positive response rate for *Overall Perception of Patient Safety* was only 42%, indicating it is an area needing improvement and suggesting that the Health Department in the Asir Region needs to take steps to improve the perception of patient safety among healthcare providers and managers. This could increase the AE reporting rate, increase the opportunity to learn from AE reports and help to prevent repetition of errors.

The *Frequency of Events Reported* dimension was positively associated with *Feedback & Communication about Error*, *Staffing* and *Non-punitive Response to Error*. This finding has important implications for developing AE reporting systems. It can be argued that communicating about errors, adequate human resources, and a non-punitive response to errors will improve the AE reporting rate. In this study, nearly half the respondents (47%) agreed that they would not report errors if they could be corrected before they affect a patient. Just less than half (49%) agreed that they would not report errors if there was no harm to the patient. Similar results have been reported in other studies,<sup>107,323,324</sup> where staffing levels and non-punitive responses to error affected the frequency of errors reported. Ideally, all types of AEs should be reported, not only to prevent possible harm, but to prevent similar errors from happening again. It is the responsibility of management to improve staffing levels, create a blame-free culture, and encourage communication about errors to reduce avoidable disputes.<sup>325</sup>

The *Teamwork within Units* was positively correlated with *Organisational Learning–Continuous Improvement* and *Feedback & Communication about Error*. In this study, *Teamwork within Units* and *Organisational Learning–Continuous Improvement* were the only two areas considered to be areas of strength. It has been well-established that teamwork requires effective communication between healthcare providers, adequate staffing levels and opportunities for continuous improvement.<sup>321</sup> *Teamwork across Units* was significantly correlated with *Staffing* levels. Increased staffing levels may also improve the effectiveness of teamwork across hospitals units. However, the positive response rate in *Teamwork across Units* and *Staffing* was very low, 32% and 24%, respectively. One of the possible reasons for this finding is the multicultural workforce environment. Janmano, Pattarida and Chaichnawirote<sup>326</sup> studied staff perception of the clinical safety climate in the multicultural environment and indicated that many felt this environment was unsafe. These communication problems seem to be deeply rooted in the organisational culture of the 15 public hospitals in the Asir Region. Communication failure has been recognised as a main cause for most malpractices and patient safety violations, including under-reporting AEs, patient injuries and death.<sup>327</sup> The present study raises the possibility that implementing proper and effective communication policies will improve patient safety culture.

The *Organisational Learning–Continuous Improvement* dimension was positively correlated with *Feedback & Communication about Error*. Error reports can be used to review and improve patient safety culture. In this study, the survey results showed that the positive response rate for *Feedback & Communication about Error* was low (42%) and, therefore, may require improvement. The interview data showed similar trends, with *Feedback & Communication About Errors* often being weak and informal. Any breakdown in the chain of feedback and communication about errors will negatively influence patient safety culture and the “situational awareness” and patient safety.<sup>328</sup> The concept of situation awareness relates mainly to non-technical skills, which include communication processes, teamwork, and management hierarchical channels of communication.<sup>329,330</sup> In the Asir Region public hospitals, management efforts are needed to improve the effectiveness of communication and other non-technical skills to build a culture that more effectively supports patient safety.

The *Management Support for Patient Safety* dimension of patient safety culture was weakly and negatively associated ( $r = -0.345$ ) with *Handoffs & Transitions*. This negative association

suggests that if management support for safety increases, the effectiveness of patient handoffs and transitions decreases. This unexpected negative correlation could be due to several reasons: (1) the *Management Support for Patient Safety* dimension of safety culture had a low positive response rate (42%), which may affect the perception of respondents towards the importance of patient handoffs and transitions; (2) patient handoffs and transitions between units often occur between health clinicians without any intervention from management; and (3) the process of handoffs between units or healthcare providers depends on communication openness, which was revealed as a problem in the Asir Region public hospitals. Several researchers in the field of patient safety have shown that handoffs are a significant problem in patient safety culture.<sup>331,332</sup> Therefore, the role of management is difficult to ignore in improving patient safety culture, including all kinds of patient handoffs. For example, management could standardise the handoffs protocol in all public hospitals in the Asir Region. This is likely to improve the process of patient handoffs and transitions and maintain patient safety.

The correlation coefficient test also showed moderate negative correlation between *Feedback & Communication about Error* and *Non-punitive Response to Error* dimensions. The findings suggest that the more non-punitive responses to error, the less communication there is about these errors. Such relationships are expected due to staff fear of punishment and this was borne out in the interviewees' responses. According to P1, *"there is no clear and proper communication or proper way to report errors, sometimes staff feel afraid to communicate about errors"*. P16 also said, *"we don't have system to check errors, we don't have anyone responsible to follow-up these errors, we are afraid of punishment, so we don't talk report all errors"*. Similar findings have been observed in other studies. Souza et al.,<sup>333</sup> observed that the non-punitive response to errors affected communication about errors and the rate of AE reporting in a Brazilian hospital and Moskop et al.<sup>334</sup> showed that barriers to AE reporting were observed at different levels in USA hospitals. According to Moskop *"establishing a non-punitive culture as a key step in eliminating errors is not easy, our practice culture is one of collaboration, cooperation, and communication. We talk about no-fault and work at it constantly."*<sup>334(p69)</sup> Changing both staff and management perception of AEs is crucial not as an occasion to point blame or punish, but as an opportunity to improve system design and performance to achieve a safe environment.<sup>335</sup> Creating a blame-free work environment

through a systemic response to AEs will help to reform the punitive culture that is often observed in healthcare organisations, which tends to prevent open communication and, thus, learning.<sup>336</sup> An understanding of the AEs in a system is the foundation for building a safer culture of safety.

The *Teamwork across Units* and *Staffing* dimensions were weakly and positively correlated. This suggests that the teamwork across hospital units will improve if staffing levels are adequate. According to Kallisch and Lee, a higher level of healthcare providers can improve the concept of teamwork and, eventually, patient safety.<sup>337</sup> Indeed, adequate staffing has been significantly associated with an improvement in teamwork, patient safety and staff satisfaction. The results of both phases of the research showed that *Staffing*, *Teamwork across Units* and *Feedback & Communication about Error* were areas for improvement. The role of management in the Health Department in the Asir Region is critical for reducing the negative effects of these findings. For instance, *Teamwork across Units* and *Staffing* can be managed by improving staffing recruitment and retention strategies.

#### 7.3.4.2 Step 2: Relationship between Participant and Hospital Characteristics and Overall Perception of Patient Safety and Frequency of Events Reported

In this step, the relationship between participant and hospital characteristics and two selected outcomes variables of the HSOPSC were examined. The aim was to identify how participant and hospital characteristics relate to *Overall Perception of Patient Safety* and the *Frequency of Events Reported*. Only significant findings are discussed.

Thirteen characteristics relating to participants and hospitals were tested (see Table 5.19 and 5.20, Chapter 5) against the two selected outcome variables of patient safety culture.

The most influential factor in safety culture was the hospital's accreditation status. This finding is in line with other studies conducted in Arab countries.<sup>279,338-340</sup> This may be because hospital accreditation can improve safety practices, which ultimately improve perceptions of safety culture. Furthermore, training and education programs conducted in accredited hospitals prior to accreditation may improve knowledge of patient safety.

However, the interviews revealed unusual and unexpected accreditation practices. P1 said "*on the day of accreditation survey we send weak nurses home, we only keep good nurses, we select good staff and give them good training and how to answer questions, also if we need*

*any equipment we can borrow from other hospitals, and when the accreditation survey finish then we can give back the equipment”.*

In addition, the clinical patient safety indicators lacked sufficient evidence to demonstrate acceptable levels of patient safety. For example, the lack of reporting systems and methods, the lack of human resources, and the lack of infection control protocols and isolation rooms for infectious diseases. According to P2, *“we don’t have rooms to isolate patient with infectious diseases, sometimes we don’t even know the correct way to look after these patients, also no infection control department in our hospital”.*

To improve the perception of patient safety, it is important to create a blame-free culture and develop a national register for the anonymous reporting of AEs.

The ANOVA tests showed significant differences in the mean scores of the *Overall Perception of Patient Safety* and *Frequency of Events Reported* between Saudi and Arabic speaking respondents and non-Saudi and English-speaking respondents. The nationality and spoken language of participants affected the *Overall Perception of Patient Safety* and *Frequency of Events Reported*. In the current study, 57%( $n = 629$ ) of participants were not Saudi nationals. The non-Saudi and English-speaking participants had a more positive perception of patient safety culture possibly because they came from a healthcare system with a better patient safety culture than evident in the Asir Region. The poor quality of English language skills among Saudi and other Arabic respondents may also have affected their perception of patient safety culture and frequency of AE reporting. A previous study Al-Khaldi,<sup>341</sup> however, suggests Saudi doctors are able to define medical AEs correctly, compared to other nationalities. This study was conducted in primary healthcare centres, which differ from hospital environments, and targeted only physicians in primary care centres, which may limit the findings of this study and account for the difference between this study and the results of the present study. In Al-Khaldi’s study, the author indicated that *“20% of Saudi doctors, 42% of Arab doctors and 20% of non-Arab doctors had attended a course on patient safety”* suggesting patient safety training could be improved in this cohort.

Other factors positively associated with the overall perception of patient safety culture and the frequency of events reported were direct contact with patients and the number of years worked in the same hospital. The positive perception of overall patient safety and frequency

of events reported might be explained by the healthcare providers' sense of responsibilities regarding their roles in the healthcare of ill patients. Other explanations for these findings could be related to the healthcare professionals' experience with safety risks in their hospitals.

In the Asir Region, management may need to support healthcare providers to maintain a positive perception of safety culture. According to findings from interview data, there was an obvious lack of management support for patient safety culture. According to P1, "*managers want the accreditation certificate only, their knowledge about safety and patient safety is limited, and they want to show their hospital is the best*". Indeed, this situation could become problematic if this positive view does not reflect the true institutional patient safety reality.

#### *7.3.4.3 Step 3: Effect of the Independent Variables of Patient Safety Culture on the Overall Perception of Patient Safety and Frequency of Events Reported*

The multiple regression analysis showed that the *Overall Perception of Patient Safety* was significantly associated with six dimensions of patient safety culture. The respondents who positively perceived *Handoffs & Transitions, Non-punitive Response to Error, Organisational Learning–Continuous Improvement, Supervisor/Manager Expectations & Actions Promoting Patient Safety, Feedback & Communication about Error* and *Teamwork within Units* had a higher overall perception of patient safety. Likewise, respondents who positively perceived *Organisational Learning–Continuous Improvement, Teamwork within Units, Management Support for Patient Safety, Non-punitive Response to Error* and *Teamwork across Units* had a higher positive perception of *Frequency of Events Reported*. These results broadly confirm the work of other studies that link independent variables of patient safety culture with the *Overall Perception of Patient Safety* and *Frequency of Events Reported*. For example, the *Non-punitive Response to Error* has been significantly correlated with *Overall Perception of Patient Safety* and *Frequency of Events Reported*.<sup>109,279,314,321,342,343</sup>

In this study, almost all areas of patient safety culture were dimensions that emerged as areas for improvement except for *Teamwork within Units* and *Organisational Learning–Continuous Improvement*. The hospitals vary in their organisational culture; however, respondents across the 15 public hospitals described their hospitals as a hierarchical organisation, which has several implications. It is suggested that this form of organisation does not support patient safety practices. According to Speroff et al.,<sup>344</sup> hierarchical culture is a critical factor that

negatively affects the development of the patient safety climate and the implementation of quality improvement initiatives. Bureaucratic organisational culture is less favourable to quality improvement; however, organisations with a “teamwork” culture are better aligned for quality improvement.<sup>344</sup> Another possible implication of hierarchical culture is its negative influence on the centralised AE reporting system. Respondents in the present study often indicated they were afraid of punitive response to AEs.

The Health Department in the Asir Region could better develop an organisational culture in a way that supports patient safety practices. Without organisational culture change, patient safety will remain at risk and AEs will continue to occur in public hospitals.

### 7.3.5 PATIENT SAFETY PREDICTORS

The fifth objective of this study postulated that participant and hospital characteristics are useful for predicting the dimensions of patient safety culture. Fifteen independent variables (gender, language, nationality, age, education, awareness of error reporting policy/method, contact with patient, hospital accreditation, hospital size, staff position, hospital tenure, professional tenure, working hours per week, marital status, and monthly income) were regressed against the four dependent variables of patient safety culture (*Patient Safety Grade, Overall Perception of Patient Safety, Number of Events Reported in the Last 12 Months and Frequency of Events Reported*). The multiple regression analysis revealed some significant predictors of the four outcome variables, which are detailed below.

#### 7.3.5.1 Patient Safety Grade

Hospital accreditation status was a significant predictor of a better patient safety grade in the 15 public hospitals assessed. The multiple regression model in Phase I explained 14% of the variance (OR = 6.36, CI 95%: 2.899–14.421) and revealed that respondents in accredited hospitals were more likely to rank patient safety higher in their hospitals. This finding is in line with the findings from other studies that observed similar effects of hospital accreditation on patient safety.<sup>278,345,346</sup> The broad aims of hospital accreditation, as presented in the literature, are to improve patient safety through effective teamwork within and across units, communication, organisational learning, and AE reporting and management.<sup>345-348</sup> This may be because in accredited hospitals, respondents are supported to attend seminars on patient safety. In addition, accredited hospitals reportedly have systematic methods to report AEs.

However, in this study, respondents from accredited hospitals had a low positive response rate to all safety dimensions except *Teamwork within Units* and *Organisational Learning–Continuous Improvement*. More studies are needed to link patient safety grade with quality indicators such as number of deaths and patient infection to be able to evaluate the actual patient safety grade.

#### 7.3.5.2 Overall Perception of Patient Safety

In the current study, the *Overall Perception of Patient Safety* was significantly predicted by four variables and explained 8% of the variance. The multiple regression test (Adjusted  $R^2 = 0.085$ ,  $F(15,775) = 5.821$ ) indicated that direct contact with patients, hospital accreditation, staff position and working hours were significant contributors in the positive overall perception of patient safety. These findings are similar to other studies of the region.<sup>109,281,290,346</sup> According to Ridberg, Roback and Nilsen, direct contact with patients is common among nurses involved in clinical patient care.<sup>349</sup> According to P30, “*if patients didn’t understand us, or we not understand them, it maybe unsafe for all of us*”. In addition, long working hours increased the contact with patients, which may eventually improve the effectiveness of communication between healthcare providers and patients.

A further factor that may have improved the respondents’ perception of safety was the hospital’s accreditation. Interestingly, hospital accreditation was positively correlated with numerous dimensions of patient safety culture. However, staffing levels need to be adequate to meet the increased non-clinical workload during accreditation and certification.<sup>350</sup> According to Ng, Leung, Johnston and Cowling,<sup>351</sup> administrative tasks and documentation of patient care management are major obstacles to national accreditation and staffing levels were identified as an area for improvement. Findings from the two phases of the present study confirm that the public hospitals in the Asir Region suffer from staff shortages in all healthcare disciplines, particularly in nursing. Staff shortages, as identified by the respondents, was the main factor that increased their workload.

#### 7.3.5.3 Number of Events Reported in the Last 12 Months

The multiple regression analysis showed that eight factors were positively significant contributors to the number of AEs reported in the last 12 months and explained 46% of the variance. The strongest predictors to reporting AEs were staff position followed by hospital



accreditation status with an odds ratio of 15.12 and 7.03, respectively. The result of this study showed that nurses were 15.12 times more likely to report AEs than doctors, managers and other healthcare providers. Wolf and Hughes<sup>352</sup> also reported that nurses were more likely to submit written AE reports than doctors. It was also observed that, in the case of medication errors, those made by nurses during the administration of medications were more likely to be reported than errors made by the medication prescribers or distributors (e.g., doctors or pharmacists).<sup>352</sup> One of the reasons that nurses reported more AEs might be due to their familiarity with the hospital culture and guidelines, protocols, and concepts of patient safety. Another possible reason may be due to cultural differences between doctors and nurses. According to Kingston et al.,<sup>353</sup> nurses reported more habitually than doctors *“due to a culture which provided directives, protocols and the notion of security, whereas the medical culture was less transparent, favoured dealing with incidents “in-house” and was less reliant on directives”*.<sup>353(p1)</sup>

The other factor that predicted the number of events reported in the last 12 months was hospital accreditation, with participants in accredited hospitals had higher AE reporting rates than non-accredited hospitals. This could be the result of staff training received in accredited hospitals. Remarkably, there was a positive relationship between the number of events reported in the last 12 months and the level of awareness. In the current study, the awareness of respondents about AE reporting methods and policies was higher in accredited hospitals than non-accredited hospitals. Other factors that had a low prediction capacity of AE reporting included participants' age, working hours, direct contact with patients, years in same profession, and years in same hospitals.

Common barriers to reporting incidents included time constraints, unsatisfactory processes, deficiency in knowledge, cultural norms, inadequate feedback, fear of punitive response, and a perceived lack of value of feedback about errors. A better understanding of these barriers to AE reporting is important for improving patient safety culture.<sup>354</sup>

#### 7.3.5.4 *Frequency of Events Reported Predictors*

In the *Frequency of Events Reported* dimension of patient safety culture, participants were asked about their likelihood of reporting different types of AEs. These AEs included errors that were caught and corrected before affecting the patient, errors that have no potential to harm

patients, and errors that could harm patients, but did not. The multiple regression analysis revealed that five independent variables were statistical predictors for the frequency of events reported and explained approximately 14% of the variance. These predictors were language spoken by participants, nationality, error reporting awareness, hospital accreditation and hospital size. These findings are in line with other studies that explored patient safety culture.<sup>278,279</sup> Lack of communication, including being unable to speak Arabic, was the one of the most influencing factors affecting patient safety culture. In addition, poor communication was a significant factor that affected patient safety culture. One of the causes that may lead to this problem is the multi-national environment in which healthcare providers cannot communicate effectively, or where there is no standardisation of communication. According to P13, *"I can speak Arabic well, also I can't understand my colleagues when they talk, they speak English and Arabic at the same time, really it is confusion, sometime I want to talk about error, but they will not understand so I don't talk"*. P18 said, *"you know, sometimes I want to ask about something from the management, but they don't speak English, even some nurses here they don't speak good English, it is hard to understand them, like when I want to tell them about indecent or error they will blame me because they can't say anything about the management"*.

Another reason for this problem is the blame culture. Almost all interviewees in the qualitative phase (Phase II) expressed their fear of punishment and blame were the reasons not to report AEs. According to Akkirman and Harris<sup>254</sup>, an organisational communication system is very important in patient safety culture. Communication breakdowns occur in different forms, including miscommunication and lack of documentation. A further factor that may have affected the frequency of events reported is working hours. According to P1, *"we work long hours because we don't have enough staff, if I work 12 hours every day with very heavy workload, then I'll not have time to report errors, because I have to fill-in forms, and sometimes only small mistakes so no need to report them, small mistakes will not affect patient"*. In fact, staff should perceive that reporting errors and near-miss errors are learning opportunities rather than events requiring punitive responses.

## 7.3.6 STRATEGIES TO IMPROVE PATIENT SAFETY IN ASIR HOSPITALS

The sixth aim of this study was to provide strategies for healthcare providers, managers, leaders and policymakers to improve patient safety culture. The current study showed some significant findings related to patient safety culture in 15 public hospitals, which are summarised in Figure 7.1.



**Figure 7.1** Major Factors Affecting Patient Safety Based on the Results of this Study

The hospitals included in this study vary in characteristics and accreditation status. The Saudi MOH managed all of these hospitals with a highly centralised and bureaucratic structure. It is important to understand the effect of management style on the organisational culture in developed countries, particularly those with a high Power Distance Index (PDI) on the scale provided by Hofstede<sup>44</sup> to improve patient safety culture.

Hofstede describes the effect of PDI as *“the extent to which the less powerful members of organisations and institutions (like the family) accept and expect that power is distributed unequally”*<sup>44(p21)</sup> from the perspective of the people with low power. As a result, a manager in a high-PDI culture will expect full compliance from their employees. For comparison, Australia PDI scores 36/100, and Saudi Arabia PDI scores 95/100<sup>44</sup> (the closer the PDI score to 100, the higher the power distance).

The main features associated with patient safety culture include supportive leadership, effective communication process, effective teamwork, effective learning and training culture, and effective AE reporting system. However, the findings from the two phases of the current study revealed that all of these safety features were considered areas requiring improvement. Barriers to improve patient safety culture can arise from many sources. One such barrier is the high PDI in Asir Region of KSA. This means that the management system in Asir Region may not be responsive to the needs of patient safety culture.

One approach to improve the culture of patient safety in high PDI countries is to gain support for the top-level of the management. Management staff should understand the principles of patient safety culture and how they can apply these principles in their settings. However, there is a lack of evidence and theory to support the improvement of patient safety culture in countries with a high PDI. Moreover, there is no previously identified framework or model that exists to support the improvement of patient safety culture in these countries. People perceive change differently, thus, countries with high PDI should adopt a framework that applies to their culture.

Based on the findings of this study, a patient safety improvement framework was developed to improve patient safety culture in KSA and other countries with a high-PDI score. The newly developed framework will fill this gap and presents a new researchable area for further empirical evaluation. The safety framework focuses on three levels of improvement including 1) management and policy, 2) organisation, and 3) safety practice. For each of these levels, there are four areas of action (see Figure 7.2). The first letter of each of these four themes across the three levels forms the acronym (SAFE), which will be used to refer to this framework and will be easy to recognise and remember by the stakeholders (Figure 7.2).

The implementation of SAFE needs two strategic levels. Firstly, the outward strategic level (macro-level). At this level, the top-level management in the national healthcare system, specifically MOH will be targeted to adopt the safety improvement policies and plans. The new policies and plans will be imposed directly on the middle-level of the management (General Directorate of Health Affairs in Saudi Regions, such as the Asir Region). According to Hofstede, managers in high-PDI countries will expect full compliance from lower ranks. Thus, the safety culture will be imposed from the higher power or level of the MOH to their employers

throughout the hierarchical administrative chain. However, top-level management personnel should be persuaded to accept changes prior to any intervention.

The second strategic level is the inward strategic level (micro-level). At this level, the managers in General Directorate of Health Affairs and hospital managers (the middle management level) will focus on the culture change of their organisational and hospitals. In this case, managers should show full compliance with change strategies that imposed by top-level management. The change will be more possible and applicable if supported by the top and middle levels of the management.

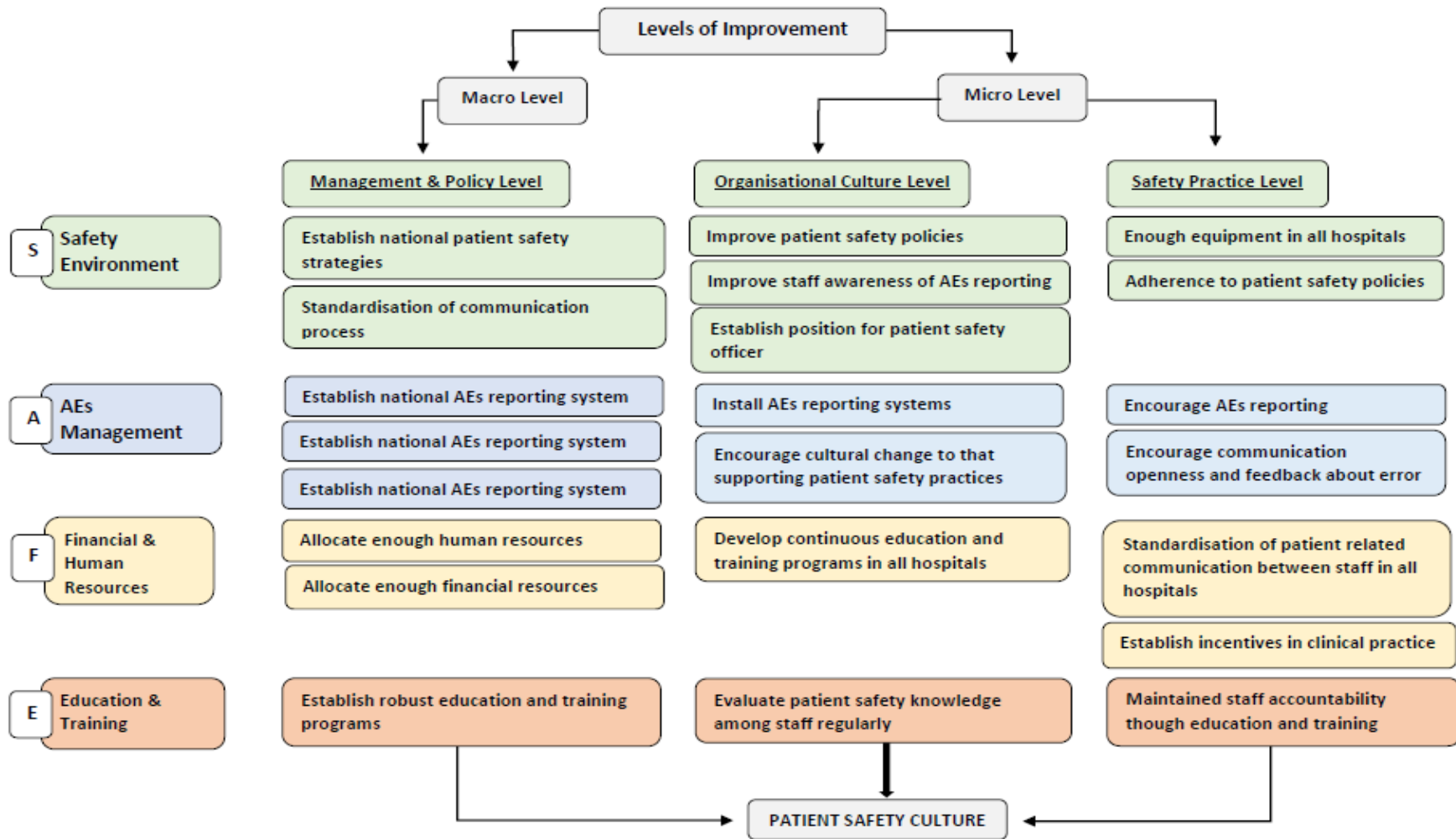


Figure 7.2 SAFE Patient Safety Improvement Framework

The developed framework “SAFE” has four themes of improvement, which are detailed below.

#### 7.3.6.1 *Safety Environmental*

Under this theme, the improvement methods will cover the three levels as follows:

- Establish a training program for decision makers in the Saudi MOH to sustain their support for patient safety culture (Management & Policy level).
- Establish national patient safety strategies and guidelines, supported by trained professionals and managers in patient safety areas. In addition, terms and definitions related to patient safety should be prepared according to the patient safety literature and translated into Arabic and English. These policies should include cultural change strategies. Eventually, the change will be imposed by top-level management in the MOH to hospital management and then to staff (Management & Policy level and Organisational level).
- Review and improve patient safety policies at the hospital level with trained staff and sufficient equipment, and establish effective AE reporting methods and policies. The reporting methods and policies should be prepared in easy and clear steps in both Arabic and English (Organisational level).
- Increase staff awareness of AE reporting methods and policies in each unit of the hospital. Moreover, all new staff should pass a patient safety test. The safety test should include the main and broad areas of patient safety and the hospital methods and policies of AE reporting (Organisational level).
- Establish a position for a patient safety officer in each public hospital supported by top-level management. The patient safety officer will follow-up the AE reports, check adherence to safety policies, conduct training programs for all staff, and send feedback and communication about errors (Organisational level).
- Standardise communication methods between staff (e.g., forms and notes). In addition, standardise patient handoffs and transitions between hospital units with the support of MOH and hospital top-level management (Management & Policy and Organisational levels).

### 7.3.6.2 *Adverse Events Management*

Under this theme, the improvement methods will cover the three levels as follows:

- Establish a national AE reporting system in all hospitals in KSA to encourage a culture of AE reporting and help to analyse the AEs. This will help to conduct research and to provide regular feedback based on AE reports to prevent the same errors from recurring. Prioritise patient safety as a centrally important issue in the MOH policies and decisions. The MOH should employ a patient safety officer at the national level and create patient safety officer positions in the administrative structure of Saudi hospitals. In addition, effective laws and regulations related to patient safety should be prepared to ensure patient safety practice (Management & Policy level and Organisational level).
- Standardise medication prescriptions in all hospitals using a standard computerised medical prescription form to minimise the number of human errors. This will enable the MOH to track medications and provide data for statistical analysis (Management & Policy level and Organisational level).
- Establish a transparent and anonymous AE reporting system in all public hospitals and adopt a non-punitive and blame-free culture to support healthcare providers to report AEs of any type and severity (Organisational level).
- Encourage the culture of organisational learning in all hospitals to develop clinical practices. This will support the continuous evaluation of patient safety indicators in each hospital and in the preparation of action plans to overcome any difficulties (Organisational level and Safety Practice level).

### 7.3.6.3 *Financial and Human Resources*

Under this theme, the improvement methods will cover the three levels as follows:

- Maintain adequate staffing levels in all hospitals with good distribution of skilled and experienced healthcare providers and managers (Management & Policy level).
- Maintain adequate resources for training programs for both clinicians and managers in patient safety areas (Management & Policy level).



- Establish a teamwork approach in hospitals through the distribution of authority and delegation of administrative power (Management & Policy level, Organisational level and Safety Practice level).
- Provide sufficient equipment and systems to enhance patient safety practices. For instance, GP-Tele-medicine in remote areas. This will reduce the workload in all hospitals (Management & Policy level).
- Increase incentives, financial allowances and salaries for healthcare clinicians and managers to improve staff retention in remote areas (Management & Policy level).

#### 7.3.6.4 *Education and Training*

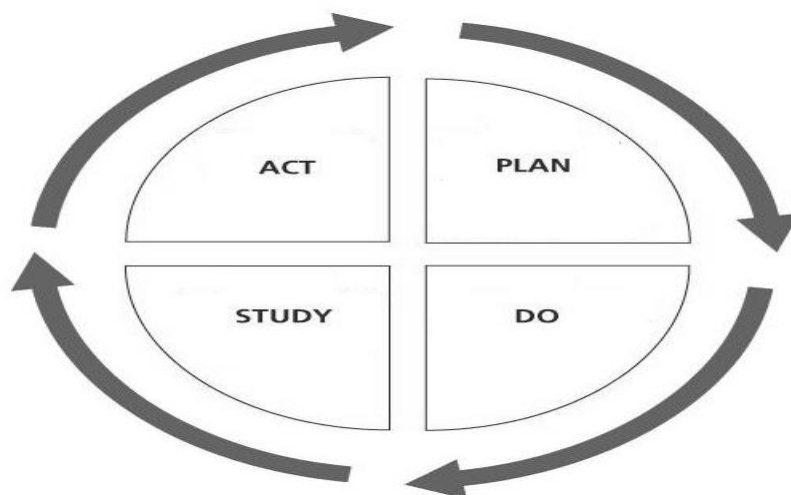
Under this theme, the improvement methods will cover the three levels as follows:

- Develop patient safety education and training in all medical schools to increase student awareness of the importance of the patient safety issue in clinical practice. In addition, implement regular and continuous patient safety programs (Management & Policy level and Organisational level).

The implementation process of the SAFE framework will follow the Plan-Do-Study-Act (PDSA)<sup>355</sup> worksheet cycle as indicated in Figure 7.3. A four-step cycle is a helpful tool for evaluating the degree of change. It has been widely used in different healthcare systems such as the National Health Service in the UK (National Health Service Institute for Innovation and Improvement). The PDSA cycle is based on a scientific method that can be applied to take immediate action, without any implications. The four phases of this cycle include Plan, Do, Study, and Act.

1. Plan phase, this cycle refers to the recognition of an opportunity and the planning of a change. For instance, in this study, the desired change is the organisational culture from blame culture to blame-free culture.
2. Do phase, this cycle refers to the temporary implementation of the change. For example, for one year in one selected hospital in the Asir Region.
3. Study phase, this cycle refers to the analysis of the results of the do phase, and to identify what has been learned. It is a reflection phase on the extent that has been made. For example, pre- and post-tests of managers' perceptions of AEs in their hospital.

4. Act phase, this cycle refers to decision making based on what has been learned in the study steps. If the desired changes are not met, a different culture-change plan is needed and the cycle should begin again.



**Figure 7.3** The PDSA Cycle (Langley et al.)<sup>355</sup>

#### 7.4 SUMMARY

This chapter discussed the major quantitative and qualitative findings in the context of the literature. At the outset, the perception of patient safety culture among surveyed healthcare providers and managers in 15 public hospitals were discussed. In general, all areas of patient safety culture were considered as areas for improvement except *Teamwork within Units* and *Organisational Learning–Continuous Improvement*. This was supported by both phases of the study and also by the findings from other patient safety research.

Hospital accreditation had a positive effect on numerous patient safety culture predictors. Patient safety improvement initiatives are gaining more attention in KSA. However, staffing levels, communication effectiveness, AE reporting methods and policies, working hours, and management support for safety have the most influence in patient safety culture. Therefore, the patient safety framework, SAFE, was developed to improve patient safety culture in public hospitals in KSA or other countries with a similar culture. The next chapter offers research conclusions, suggestions for future research, and recommendations for improving patient safety culture in public hospitals.

## CHAPTER 8. CONCLUSION

### 8.1 INTRODUCTION

Chapter 8 discusses the implications of the findings and concludes the main findings. In addition, it presents a set of recommendations for improving patient safety culture in public hospitals in the Asir Region of KSA. It also evaluates the research limitations and identifies directions for future research.

### 8.2 CONTRIBUTION

With the belief of the importance of patient safety, this study was conducted to evaluate the patient safety culture in 15 public hospitals in the Asir Region. This research is the first study that has examined patient safety culture in a group of large, small, remote, accredited and non-accredited hospitals. It identified a significant relationship between participant and hospital characteristics and patient safety culture dimensions.

The qualitative findings of this study confirm the effect of organisational culture on their attitude to patient safety practices. Additionally, interviewees exposed how some hospitals attained their accreditation certificate. Such findings could be used to improve the current methods of hospital accreditation and change the organisational culture.

This study provides new knowledge on patient safety culture from a different cultural perspective and healthcare system to that often found in the literature. This has contributed to the growing research pool in the area of patient safety. It also presents a comprehensive review and description of the healthcare system in KSA. This contribution addresses the current void in scholarly literature and provides useful information for managers, healthcare providers, researchers, and policymakers in KSA and globally. This study fills a perceived gap in the literature, more specifically in the Saudi context.

The qualitative data identified the significant role that leaders play in organisational culture in general and the patient safety arena specifically. The findings confirmed Hofstede's cultural theory of power distance and its effects on organisational behaviour.<sup>110</sup> The role of managers in countries with high power distance is critical for improving patient safety. Thus, the top

level of health management is included in the SAFE framework to impose patient safety culture in public hospitals.

Finally, the study demonstrates the importance of adopting mixed method research approaches. In this study, the quantitative and qualitative results were generally consistent, enabling a triangulation of the results. In addition, the results offered different perspectives for the same phenomenon, but the qualitative data provided a richer and deeper understanding.

### **8.3 LIMITATIONS**

As with any research, a number of limitations were identified. Prior to the interpretation of the study findings, these results should be interpreted in the context of the limitations described below:

1. The data was collected using a self-reporting survey leaving the interpretation to the participant. The use of self-reporting tools may decrease the reliability of responses due to the misinterpretation of some of the items.<sup>356</sup>
2. The completed questionnaires were collected from the participants through their managers. This strategy may have allowed the managers to impose pressure (intentional or unintentional) on participants to complete the survey in a particular way.<sup>357</sup> Nonetheless, there were no reports of pressure placed on respondents from managers.
3. Despite the quantitative results indicating significant differences between the accredited and non-accredited hospitals, the Phase II findings from both sites were similar. One explanation is that the results of Phase II, concerning culture, are relevant to all multinational workforces in KSA regardless of the hospital they work in.
4. At the time of data collection, there was a military conflict between KSA and a neighbouring country, which limited the time and access to some of the hospitals within the conflict catchment area.
5. The results of the current research would have been more comprehensive if it had included other regions in KSA. However, due to the lack of time, and human and financial resources available to the project, the data were collected from the fourth

largest region in terms of population, which is characterised by urban and remote areas.

6. There was a possibility of cultural and social desirability bias, where participants may have knowingly tried to give a favourable impression of themselves and/or their workplaces. This could occur when respondents want to safeguard their job as described by Holtgraves,<sup>358</sup> Paullhus,<sup>359</sup> and Zikmund, Babin, Carr and Griffin.<sup>360</sup>
7. The possibility of recall bias could attenuate the rate of AEs since most of the respondents agreed they would not report simple AEs that would not harm the patient. In addition, respondents were reluctant to report AEs to avoid blame and/or punitive responses to error. However, the survey tool included a wide interval range for the frequencies of AEs. Thus, its impact might not be large enough to influence the findings.
8. There was a possibility of acquiescence bias, which is a category of response and refers to any peculiar cultural communication styles between participants to agree with all the questions to indicate a positive connotation. According to Baron-Epel et al.,<sup>361</sup> Minkov,<sup>362</sup> and Smith,<sup>363</sup> acquiescence bias is more common in Middle Eastern countries, where the tendency to provide consistently agreeable or polarised answers is very high. However, the researcher thinks that the participants in the current study provided accurate and truthful information. One reason for this assumption is because all participants were professionally licensed. In addition, most of the participants were experienced and knowledgeable about healthcare management in KSA, and open to explain their negative experiences of working in public hospitals; they did not try to gloss over the deficiencies in the system. Thus, the possibility of social desirability bias was considered minimal.

Despite these potential limitations, this study has provided important results and contributed to the body of research knowledge related to patient safety culture in public hospitals in KSA. Managers, healthcare leaders, policymakers and healthcare providers who are interested in enhancing patient safety culture may benefit from this research.

## **8.4 IMPLICATIONS FOR FUTURE RESEARCH**

Following on from the findings from this study, there are important research areas that need to be considered for future research. The AEs in KSA need to be further studied on a larger scale. Future studies may include intervention studies to improve the areas that need improvement in patient safety culture.

In addition, research should be conducted on the relationship between management behaviours and/or styles and the culture of patient safety and how this fits in the organisational culture. A further comparative study regarding patient safety culture and other public hospitals in different regions of KSA is needed.

Further psychometric evaluation studies are needed to test and modify, if required, the AHRQ survey tool that was used in this study to suit differences in Middle Eastern culture and language.

Lastly, it is recommended that another study is conducted in five years' time to determine whether any changes in the dimensions of patient safety culture have been acted upon compared with the results reported in this study.

## **8.5 RECOMMENDATIONS**

Based on the findings of this study, the following recommendations emerged:

### *8.5.1 MACRO LEVEL (MANAGEMENT AND POLICY)*

- Patient safety should be a priority for policymakers in the national healthcare system in KSA. Patient safety is the responsibility of both professional staff and management staff in healthcare organisations.
- Health policymakers and professional staff should attend short courses about the meaning of safety culture to bridge the gap in knowledge between managers and clinicians.
- Staffing is a real threat for patient safety in the national healthcare system in KSA. Management should improve the recruitment and retention of staff by adding more incentives, allowances and wages.
- Communication is another threat for patient safety. Health policymakers should consider standardising patient handoffs and communication systems in all public hospitals in KSA. For example, e-patient files and SBAR (Situation, Background,

Assessment, Recommendation). This will improve the communication process between healthcare providers and minimise AEs due to misunderstandings.

- Establish a position for “Patient Safety Officers” in top-level management in each public hospital. In addition, patient safety laws should be established that include a clear definition of patient safety, descriptions of clinical errors, definitions of terms related to patient safety, and patient rights if errors occur.
- Management policies should be standardised so that AE reporting systems, methods and steps are consistent across the KSA.

#### 8.5.2 *MICRO LEVEL (ORGANISATIONAL AND PRACTICE)*

- Hospital managers should support a blame-free culture.
- The Patient Safety Officer should be involved in safety culture improvement plans.
- The hospital culture should include a structured education program for all managers and clinicians, particularly for new staff.
- Each hospital should develop and implement orientation programs for new staff and newly graduated students.
- Hospital managers are encouraged to create a culture in which staff will be confident to report AEs without any implications or feeling vulnerable.
- AE reporting methods, systems and policies should be taught to all staff during orientation.
- Staff should be encouraged to work as a team within and across hospital units through better distribution of power and delegation of tasks.
- Enhance continuous education and training policies and programs for all staff to maintain up-to-date knowledge and skills. This may include workshops, seminars and conferences.
- Recognition of staff achievements related to patient safety practices through an effective incentive system. For instance, promotion, certificate, financial reward or recognition for initiative rewards.
- Improve workplace environment in terms of infrastructure, building safety, equipment and supplies, and security.
- Patient involvement in patient safety discussions and, if needed, decision-making at all levels of organisational management. In most stages of healthcare, opportunities exist

for patients to contribute to reducing patient safety incidents, such as effectively minimising medication errors.<sup>364</sup>

- Implement plans to evaluate patient safety culture on a regular basis, which will increase the early detection of and improve any weaknesses in the safety culture.
- Enhance the harmony between staff from different cultural backgrounds. More equitable and accepting atmospheres will help to eliminate the lack of harmony between staff and improve teamwork.
- It would be more valuable for new staff (from non-Arabic backgrounds) to attend a short course on patient safety in Arabic language. This will enhance their interaction with patients and reduce any misunderstandings due communication problem.<sup>365</sup>

## **8.6 CONCLUSION**

The main conclusion of this study is that patient safety culture in public hospitals in the Asir Region of KSA needs urgent intervention. All areas of patient safety are considered areas for improvement except for *Teamwork within Units* and *Organisational Learning–Continuous Improvement*. A paradox existed between the Asir public hospitals based on their size and health accreditation status.

Based on evidence in the literature, this research supports the implementation of the patient safety improvement “SAFE” framework in countries where the power distance index is high. This framework depends on the effect of top-level management on their employers and full compliance with the improvement strategies. In addition, future research should establish the significance and scope of the current study to evaluate the “SAFE” framework in public hospitals in the Asir Region of KSA.

The research methods used in this study should have wider applicability in different regions of KSA and perhaps to other countries with similar cultures and systems. Patient safety can be improved with the continuous evaluation and development of organisational culture. The unique multicultural workforce culture in the public hospitals in KSA can be used to significantly improve patient safety.



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## REFERENCES

1. World Health Organisation. Patient Safety Data and Statistics [Internet]. 2017 [cited 2018 Feb 27]. Available from: <http://www.euro.who.int/en/health-topics/Health-systems/patient-safety/data-and-statistics>
2. Heather H. Safety culture, corporate culture: organizational transformation and the commitment to safety. *Disaster Prev Manag.* 1994 [cited 2015 May 13];3(3):49-58.
3. Guldenmund FW. The nature of safety culture: a review of theory and research. *Saf Sci.* 2000 [cited 2016 Oct 29 ];34(1):215-257.
4. Baker GR, Norton PG, Flintoft V, Blais R, Brown A, Cox J, et al. The Canadian adverse events study: the incidence of adverse events among hospital patients in Canada. *CMAJ.* 2004 [cited 2016 Oct 13];170(11):1678.
5. Morath JM, Turnbull IE. *To do no harm.* San Francisco, CA: John Wiley & Sons, Inc; 2005.
6. Institute of Medicine. *To err is human: building a safer health system* [Internet]. Washington, DC: National Academy of Sciences; 1999 [cited 2015 Mar 7]. Available from: <https://www.nap.edu/download/9728>
7. Department of Health. *An organisation with a memory. Report of an expert group on learning from adverse events in the NHS* [Internet]. London: The Stationery Office; 2000 [cited 2014 Sep 5]. Available from: [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/d](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/d)
8. Wilson R, Runciman W, Gibberd R, Harrison B, Newby L, Hamilton J. The quality in Australian health care study. *Med J Aust.* 1995 [cited 2013 Aug 27];163(6 Nov):458-471.
9. Jha AK, Larizgoitia I, Audera-Lopez C, Prasopa-Plaizier N, Waters H, Bates DW. The global burden of unsafe medical care: analytic modelling of observational studies. *BMJ Qual Saf.* 2013 [cited 2015 Nov 30];22(10):809-815.
10. AHRQ PSNet Patient Safety Network. Patient safety [Internet]. AHRQ, US; 2004 [updated 2017; cited 2016 Aug 9]. Available from: <https://www.ahrq.gov/sops/quality-patient-safety/patientsafetyculture/hospital/index.html>
11. Wilson RM, Michel P, Olsen S, Gibberd RW, Vincent C, El-Assady R, et al. Patient safety in developing countries: retrospective estimation of scale and nature of harm to patients in hospital. *BMJ.* 2012 [cited 2015 Jan 17];344:1-14.
12. Ministry of Health. *Statistical book* [Internet]. Riyadh: Health Mo; 2016 [cited 2017 Jan 29]. Available from: <https://www.moh.gov.sa/en/ministry/statistics/book/pages/default.aspx>
13. Arab News. Medical errors 'claim 11 lives a month' in KSA [Internet]. Online; 2015 [cited 2016 Oct 27]. Available from: <http://www.arabnews.com/saudi-arabia/news/830371>
14. Saudi Central Board for Accreditation of Healthcare Institutions. *Reporting medical errors* [Internet]. Riyadh: CBAHI; 2016 [cited 2016 Nov 13]. Available from: <https://portal.cbahi.gov.sa/english/patient-safety/reporting-medical-errors>

15. Elwazer S, Jamjoom M, Ayish S. Saudi Health Ministry under fire in case of girl and alleged HIV-tainted blood. CNN. 2013 [cited 2013 Mar 5].
16. Al Salem A. Sabq reveals new details about a medical error led to amputate a 30-year lady in Dammam [Internet]. Online: Sabq; 2016 [cited 2016 Apr 21]. Available from: <https://sabq.org/%D8%B3%D8%A8%D9%82-%D8%AA%D9%83%D8%B4%D9%81-%D8%AA%D9%81%D8%A7%D8%B5%D9%8A%D9%84-%D8%AC%D8%AF%D9%8A%D8%AF%D8%A9-%D9%81%D9%8A-%D9%82%D8%B6%D9%8A%D8%A9-%D8%AE%D8%B7%D8%A3-%D8%B7%D8%A8%D9%8A-%D9%8A%D8%A8%D8%AA%D8%B1-%D9%82%D8%AF%D9%85-%D8%AB%D9%84%D8%A7%D8%AB%D9%8A%D9%86%D9%8A%D8%A9-%D8%A8%D8%A7%D9%84%D8%AF%D9%85%D8%A7%D9%85>
17. Organization. WH. Global priorities for research in patient safety [Internet]. WHO; 2008 [cited 2016 Apr 2]. Available from: [http://www.who.int/patientsafety/research/priorities/global\\_priorities\\_patient\\_safety\\_research.pdf](http://www.who.int/patientsafety/research/priorities/global_priorities_patient_safety_research.pdf)
18. Ministry of Foreign Affairs. About Saudi Arabia [Internet]. MOFA; 2013 [cited 2015 Mar 27]. Available from: from <http://www.mofa.gov.sa>
19. Central Department of Statistics. In: Statistical yearbook [Internet]. 2013. Riyadh: CDSI printings.
20. Mufti MH. Healthcare development strategies in the Kingdom of Saudi Arabia. New York: Kluwer Academic Publishers; 2000.
21. Worldatlas. Saudi Arabia [Internet]. 2017 [cited 2017 Jul 27]. Available from: <https://www.worldatlas.com/webimage/countrys/asia/sa.htm>
22. United Nation. Saudi Arabia [Internet]. UN; 2008 [cited 2015 Mar 2]. Available from: <http://data.un.org/CountryProfile.aspx?crName=Saudi%20Arabia>
23. Central Intelligence Agency. The world factbook [Internet]. CIA; 2014 [cited 2014 Dec 10]. Available from: <https://www.cia.gov/library/publications/the-world-factbook/geos/sa.html>
24. World Bank Group. Saudi Arabia data profile [internet]. 2010 [cited 2014 Jun 10]. Available from: [http://ddp-ext.worldbank.org/ext/ddpreports/ViewSharedReport?&CF=&REPORT\\_ID=9147&REQUEST\\_TYPE=VIEWADVANCED](http://ddp-ext.worldbank.org/ext/ddpreports/ViewSharedReport?&CF=&REPORT_ID=9147&REQUEST_TYPE=VIEWADVANCED)
25. Gesler WM, Kearn RA. Culture, place, health. London: Routledge; 2002.
26. Almalki MJ, FitzGerald G, Clark M. The relationship between quality of work life and turnover intention of primary health care nurses in Saudi Arabia. BMC Health Serv Res. 2012 [cited 2013 Apr 17];12(1):314.
27. Alharthi F, Alenad A, Baitalmal H, Alkhurashi A. In: Health over a century [Internet]. 1999. Riyadh: MOH & ASBAR Centre for Studies Research & Communication.
28. Al-Saeed AH. Medical liability litigation in Saudi Arabia. Saudi J Anaesth. 2010 Sep-Dec [cited 2014 May 10];4(3):122-126.

29. Ministry of Health. Strategic plan of Ministry of health 2010-2010 Kingdom of Saudi Arabia. Riyadh: MOH; 2016 [cited 2017 Jan 17]. Available from: <http://www.moh.gov.sa/Ministry/About/Pages/Strategy.aspx>
30. Gallagher EB. Modernization and health reform in Saudi Arabia. In: Mamtani R, Lowenfels A, editors. Health care reform around the world. Washington, DC: Georgetown University Press; 2002.
31. World Health Organisation. The world health report 2000 - Health systems: improving performance [Internet]. Geneva; 2000 [cited 2014 Apr 8].
32. Sajjad R, Qureshi MO. An assessment of the healthcare services in the Kingdom of Saudi Arabia: an analysis of the old, current, and future systems. *Int J Healthc Manag.* 2018 [cited 2018 Apr 17]:1-9.
33. Aljuaid M, Mannan F, Chaudhry Z, Rawaf S, Majeed A. Quality of care in university hospitals in Saudi Arabia: a systematic review. *BMJ Open.* 2016 [cited 2017 Jul 2];6(2):e008988.
34. Sebai ZA, Milaat WA, Al-Zulaibani A. Health care services in Saudi Arabia: past, present and future. *J Family Community Med.* 2001 Sep-Dec [cited 2015 Nov 17];8(3):19-23.
35. Ministry of Health. Health statistical year book [Internet]. Riyadh: MOH; 2007 [cited 2014 May 12].
36. Househ M, Yunus F. Emergency department waiting times (EDWaT): A patient flow management and quality of care rating mHealth application. *Stud Health Technol Inform.* 2014 [cited 2015 Jan 26];202:229-232.
37. Abu-Zinadah S. Nursing situation in Saudi Arabia [Internet]. Riyadh: Saudi Nursing Board SCfHS; 2006 [cited 2014 Feb 13].
38. Alhusaini H. Obstacles to the efficiency and performance of Saudi nurses at the Ministry of Health, Riyadh Region: analytical field study. Riyadh: Ministry of Health; 2006 [2014 Jun 11].
39. Johnstone MJ, Kanitsaki O. Culture, language, and patient safety: making the link. *Int J Qual Health Care.* 2006 [cited 2014 Jul 29];18(5):383-388.
40. Renzaho A, Romios P, Crock C, Sønderlund A. The effectiveness of cultural competence programs in ethnic minority patient-centered health care a systematic review of the literature. *Int J Qual Health Care.* 2013 [cited 2015 May 1];25(3):218-261.
41. Wakefield J, McLaws M, M W, Patton L. Patient safety culture: factors that influence clinician involvement in patient safety behaviours. *Qual Saf Health Care.* 2010 [cited 2015 Jun 20];19(6):589-591.
42. Brwon A. Organisational culture. 2nd ed. London: Financial Times Pitman Publishing; 1998.
43. Schein E. Organizational culture and leadership. 3rd ed. Francisco: John Wiley & Sonsan; 2004.
44. Hofstede G. Culture's consequences international differences in work-related values. ABRIDGED ed. London: SAGE Publication; 1980.
45. T CP, McCrae R. Domains and facets: hierarchical personality assessment using the revised NEO personality inventory. *J Pers Assess.* 1995 [cited 2017 Mar 3];64(1):21-50.

46. Zheng W, Yang B, McLean GN. Linking organizational culture, structure, strategy, and organizational effectiveness: mediating role of knowledge management. *J Bus Res.* 2010 [cited 2017 Jul 5];63(7):763-771.
47. Cameron S, Quinn E, DeGraff J, Thakor V. Competing values leadership. In: Cameron S, Quinn E, DeGraff J, Thakor V, editors. *Competing values leadership: creating value in organizations.* Cheltenham UK: Edward Elgar Publishing, Inc; 2006.
48. Schein EH. *Organizational culture and leadership* 4th ed. San Francisco, CA. USA: Jossey-Bass; 2010.
49. Schein EH. Organizational culture: What it is and how to change it. In: Evans P, Doz Y, Laurent A, editors. *Human resource management in international firms.* London: Palgrave Macmillan; 1990.
50. Lee T. Assessment of safety culture at a nuclear reprocessing plant. *Work Stress.* 1998 [cited 2013 Oct 17];12(3):217-237.
51. International Atomic Energy Agency. IAEA Safety standards and guidance on safety culture in the pre-operational phases [Internet]. 1991 [cited 2013 Oct 11]. Available from: [https://www.iaea.org/NuclearPower/Downloadable/Meetings/2014/2015-02-03-02-06/D4\\_S10\\_IAEA\\_Haage.pdf](https://www.iaea.org/NuclearPower/Downloadable/Meetings/2014/2015-02-03-02-06/D4_S10_IAEA_Haage.pdf)
52. Sammer C, Kykens K, Singh K, Mains D, Lackan N. What is patient safety culture? A review of the literature. *J Nurs Scholarsh.* 2010 [cited 2014 Dec 10];42(2):156-165.
53. Hudson P. Applying the lessons of high risk industries to health care. *Qual Saf Health Care.* 2003 [cited 2014 Jul 30];12(suppl 1):i7.
54. Wiegmann DA, Zhang H, von Thaden TL, Sharma G, Gibbons AM. Safety culture: an integrative review. *Int J Aviat Psychol.* 2004 [cited 2014 Dec 17];14(2):117-134.
55. Reason J. *Managing the risks of organizational accidents.* Hampshire, England: Ashgate Publishing Limited; 1997.
56. Flin R, Mearns K, O'Connor P, Bryden R. Measuring safety climate: identifying the common features. *Safety Sci.* 2000 [cited 2014 Feb 18];34(1):177-192.
57. Dedobbeleer N, Béland F. A safety climate measure for construction sites. *J Safety Re.* 1991 [cited 2014 Jan 27];22(2):97-103.
58. Griffin MA, Neal A. Perceptions of safety at work: a framework for linking safety climate to safety performance, knowledge, and motivation. *J Occup Health Psychol.* 2000 [cited 2014 Jun 19];5(3):347-358.
59. Haecker S, Goldenhary LM. Safety culture and safety climate in construction: a review of current literature [Internet]. CPWR [cited 2015 Jan 13]. Report No.: CPWR. Available from: [https://www.cpwr.com/sites/default/files/publications/HeckerSafetyClimateSafetyCultureKF\\_2.pdf](https://www.cpwr.com/sites/default/files/publications/HeckerSafetyClimateSafetyCultureKF_2.pdf)
60. Guldenmund FW. The use of questionnaires in safety culture research-an evaluation. *Saf Sci.* 2007 [cited 2015 Jan 27];45(6):723-743.
61. Mearns K, Flin R. Assessing the state of organisational safety: culture or climate? *Curr Psychol.* 1999 [cited 2014 Aug 11];18(1):5-17.

62. Millenson ML. Pushing the profession: how the news media turned patient safety into a priority. *Qual Saf Health Care*. 2002 [cited 2016 Oct 27];11(1):57.
63. World Health Organization. Patient safety [Internet]. Online: WHO: Regional Office for Europe; 2016 [cited 2017 Aug 10]. Available from: <http://www.euro.who.int/en/health-topics/Health-systems/patient-safety/patient-safety>
64. World Health Organisation. World alliance for patient safety [Internet]. Online: WHO; 2014 [cited 2016 Jul 10]. Available from: <http://www.who.int/patientsafety/worldalliance/en/>
65. Kohn L, Corrigan JM, Donaldson MS. *To err is human: building a safer health system*. Washington, D.C: National Academy Press; 2000.
66. Agency for Healthcare and Research and Quality. AHRQ's Patient safety initiative: building foundations, reducing risk [Internet]. Rockville, MD: AHRQ; 2003 [cited 2013 Mar 19]. Available from: <https://archive.ahrq.gov/research/findings/final-reports/pscongrpt/psiniapp1.html>
67. Montoya I, Kimball OM. Gauging Patient Safety Programs *J Allied Health*. 2013 [cited 2016 October 2];42(3):182-186.
68. Gaal S, Verstappen W, Wensing M. Patient safety in primary care: a survey of general practitioners in the Netherlands. *BMC Health Serv Res*. 2010 [cited 2013 July 7];10(1):21.
69. Runciman W, Hibbert P, Thomson R, Van Der Schaaf T, Sherman H, Lewalle P. Towards an International Classification for Patient Safety: key concepts and terms. *Int J Qual Health Care*. 2009 [cited 2014 Spetember 27];21(1):18-26.
70. Emanuel L, Berwick D, Conway J, Combes J, Hatlie M, Leape L, et al. *What Exactly Is Patient Safety?* . 2008.
71. Cronenwett L, Sherwood G, Barnsteiner J, Disch J, Johnson J, Mitchell P, et al. Quality and Safety Education for Nurses. *Nurs Outlook*. 2007 May-Jun [cited 2015 May 22];55(3):122-31.
72. Heckinger E, Chappell H, Downes D, Fitzner K. Disease Management: A Mid-Decade Evolution Toward Patient Safety. *Home Health Care Management & Practice*. 2006 [cited 2016 May 1];18(3):178-185.
73. Pronovost PJ, Thompson DA, Holzmueller CG, Lubomski LH, Morlock LL. Defining and measuring patient safety. *Crit Care Clin*. 2005 Jan [cited 2013 January 30];21(1):1-19, vii.
74. Woolf SH. Patient safety is not enough: targeting quality improvements to optimize the health of the population. *Ann Intern Med*. 2004 Jan 6 [cited 2014 July 2];140(1):33-6.
75. Mohr J, Batalden P, Barach P. Integrating patient safety into the clinical microsystem. *Quality and Safety in Health Care*. 2004 [cited 2014 July 2];13(suppl 2):ii34.
76. Donabedian A. *Explorations in quality assessment and monitoring: the definition of quality and approaches to its assessment*. Ann Arbor, MI: Health Administration Press; 1980.
77. Perneger TV. The Swiss cheese model of safety incidents: are there holes in the metaphor? *BMC Health Serv Res*. 2005 [cited 2014 Oct 1];5:71-71.
78. Klein GA. *Sources of power: how people make decisions*. 1st ed. London, England: MIT Press; 1999.

79. Kirk S, Parker D, Claridge T, Esmail A, Marshall M. Patient safety culture in primary care: developing a theoretical framework for practical use. *Qual Saf Health Care*. 2007 [cited 2016 Sep 27];16(4):313-320.
80. Smits M, Wagner C, Spreeuwenberg P, van der Wal G, Groenewegen PP. Measuring patient safety culture: an assessment of the clustering of responses at unit level and hospital level. *Qual Saf Health Care*. 2009 Aug [cited 2016 Jun 7];18(4):292-296.
81. Halligan M, Zecevic A. Safety culture in healthcare: a review of concepts, dimensions, measures and progress. *BMJ Qual Saf*. 2011 Apr [cited 2016 May 10];20(4):338-343.
82. Singla AK, Kitch BT, Weissman JS, Campbell EG. Assessing patient safety culture: a review and synthesis of the measurement tools. *J Patient Saf*. 2006 [cited 2015 Nov 30];2(3):105-115.
83. Colla JB, Bracken AC, Kinney LM, Weeks WB. Measuring patient safety climate: a review of surveys. *Qual Saf Health Care*. 2005 [cited 2015 Nov 22];14(5):364-366.
84. Guldenmund FW. (Mis)understanding safety culture and its relationship to safety management. *Risk Anal*. 2010 [cited 2016 Dec 3];30(10):1466-80.
85. Ginsburg L, Gilin D, Tregunno D, Norton PG, Flemons W, Fleming M. Advancing measurement of patient safety culture. *Health Serv Res*. 2009 [cited 2017 July 10];44(1):205-224.
86. Fleming M. Patient safety culture measurement and improvement: a "how to" guide. *Healthc Q*. 2005 [cited 2016 Mar 10];8 Spec No:14-9.
87. The Health Foundation UK. Does improving safety culture affect patient outcomes? [Internet]. 2011 [cited 2016 May 10]. Available from: <http://www.health.org.uk/sites/health/files/DoesImprovingSafetyCultureAffectPatientOutcomes.pdf>
88. European Union Network for Patient Safety. Use of patient safety culture instruments and recommendations. Denmark: European Society for Quality in Healthcare; 2010 [cited 2016 Jun 10]. Available from: [http://www.pasq.eu/DesktopModules/BlinkQuestionnaires/QFiles/448\\_WP4\\_REPORT\\_Use\\_of\\_PSCI\\_and\\_recommendations\\_-\\_March\\_2010.pdf](http://www.pasq.eu/DesktopModules/BlinkQuestionnaires/QFiles/448_WP4_REPORT_Use_of_PSCI_and_recommendations_-_March_2010.pdf)
89. Flin R, Burns C, Mearns K, Yule S, Robertson EM. Measuring safety climate in health care. *Qual Saf Health Care*. 2006 Apr [cited 2017 June 10];15(2):109-15.
90. Jackson J, Sarac C, Flin R. Hospital safety climate surveys: measurement issues. *Curr Opin Crit Care*. 2010 [cited 2016 Jun 20];16(6):632-638.
91. Sorra J, Rockville W, Gray L, Streagle S, Famolaro T, Yount N, et al. AHRQ Hospital survey on patient safety culture: user's guide [Internet]. Rockville, MD: Publication A; 2016 [cited 2017 June 17]. Available from: <https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/patientsafetyculture/hospital/userguide/hospcult.pdf>
92. Alahmadi HA. Assessment of patient safety culture in Saudi Arabian hospitals. *Qual Saf Health Care*. 2010 Oct [cited 2014 October 12];19(5):e17.

93. Alhawassi TM, Abuelizz HA, Almetwazi M, Mahmoud MA, Alghamdi A, Alruthia YS, et al. Advancing pharmaceuticals and patient safety in Saudi Arabia: A 2030 vision initiative. *Saudi Pharm J*. 2018 [cited 2017 Jul 3];26(1):71-74.
94. Alswat K, Abdalla RAM, Titi MA, Bakash M, Mehmood F, Zubairi B, et al. Improving patient safety culture in Saudi Arabia (2012–2015): trending, improvement and benchmarking. *BMC Health Serv Res*. 2017 [cited 2016 Dec 10];17(1):516.
95. Zakari N. Attitude of academic ambulatory nurses toward patient safety culture in Saudi Arabia. *Life Sci J*. 2011 [cited 2016 Jan 11];8(3):230-237.
96. Aboshaiqah AE, Baker OG. Assessment of nurses' perceptions of patient safety culture in a Saudi Arabia hospital. *J Nurs Care Qual*. 2013 Jul-Sep [cited 2016 Apr 13];28(3):272-280.
97. Al-Saleh KS, Ramadan MZ. Direct and indirect employee questionnaires for assessing patient Safety in Saudi. *Applied Medical Informatics*. 2010 [cited 2017 Feb 19];26(2):63-72.
98. Walston SL, Al-Omar BA, Al-Mutari FA. Factors affecting the climate of hospital patient safety: a study of hospitals in Saudi Arabia. *Int J Health Care Qual Assur*. 2010 [cited 2017 Jul 2];23(1):35-50.
99. Al-Ahmadi TA. Measuring patient safety culture in riyadh's hospitals: a comparison between public and private hospitals. *J Egypt Public Health Assoc*. 2009 [cited 2014 Aug 4];84(5-6):479-500.
100. Almutairi AF, Gardner G, McCarthy A. Perceptions of clinical safety climate of the multicultural nursing workforce in Saudi Arabia: a cross-sectional survey. *Collegian*. 2013 [cited 2015 Oct 8];20(3):187-194.
101. Alayed AS, Loof H, Johansson UB. Saudi Arabian ICU safety culture and nurses' attitudes. *Int J Health Care Qual Assur*. 2014 [cited 2016 Feb 10];27(7):581-593.
102. Auer C, Schwendimann R, Koch R, De Geest S, Ausserhofer D. How hospital leaders contribute to patient safety through the development of trust. *J Nurs Adm*. 2014 [cited 2016 Dec 2];44(1):23-29.
103. National Quality Forum. Patient safety 2016 [Internet]. National Quality Forum; 2016 [cited 2017 Dec 10]. Report No.: HHSM-500-2012-00009I. Available from: [https://www.google.com.au/search?newwindow=1&ei=ZJKeWp7IFYSA8QWR5JCQDw&q=%22National+Quality+Forum%22%3A+moral%3A+patient%3A+safety%3A+system&oq=%22National+Quality+Forum%22%3A+moral%3A+patient%3A+safety%3A+syste m&gs\\_l=psy-ab.3..33i21k1l2.1707537.79895216.0.79895481.80.57.2.0.0.0.657.9148.3-15j5j3.24.0....0...1.1.64.psy-ab..56.22.7998.6..0j35i39k1j0i131k1j33i160k1j33i22i29i30k1.340.Tqzlij3KHWU](https://www.google.com.au/search?newwindow=1&ei=ZJKeWp7IFYSA8QWR5JCQDw&q=%22National+Quality+Forum%22%3A+moral%3A+patient%3A+safety%3A+system&oq=%22National+Quality+Forum%22%3A+moral%3A+patient%3A+safety%3A+syste m&gs_l=psy-ab.3..33i21k1l2.1707537.79895216.0.79895481.80.57.2.0.0.0.657.9148.3-15j5j3.24.0....0...1.1.64.psy-ab..56.22.7998.6..0j35i39k1j0i131k1j33i160k1j33i22i29i30k1.340.Tqzlij3KHWU)
104. Parand A, Dopson S, Renz A, Vincent C. The role of hospital managers in quality and patient safety: a systematic review. *BMJ Open*. 2014 [cited 2017 Oct 9];4(9):e005055.
105. Hamdan M, Saleem AA. Assessment of patient safety culture in Palestinian public hospitals. *Int J Qual Health Care*. 2013 [cited 2017 Oct 7];25(2):167-175.
106. Merrill KC. Leadership style and patient safety: implications for nurse managers. *J Nurs Adm*. 2015 Jun [cited 2017 Jan 29];45(6):319-324.

107. Wang X, Liu K, You L-m, Xiang J-g, Hu H-g, Zhang L-f, et al. The relationship between patient safety culture and adverse events: a questionnaire survey. *Int J Nurs Stud*. 2014 [cited 2016 Nov 10];51(8):1114-1122.
108. Frankel A, Grillo SP, Pittman M, Thomas EJ, Horowitz L, Page M, et al. Revealing and resolving patient safety defects: the impact of leadership walkrounds on frontline caregiver assessments of patient safety. *Health Serv Res*. 2008 [cited 2014 May 13];43(6):2050-2066.
109. El-Jardali F, Jaafar M, Dimassi H, Jamal D, Hamdan R. The current state of patient safety culture in Lebanese hospitals: a study at baseline. *Int J Qual Health Care*. 2010 [cited 2016 Oct 1];22(5):386-395.
110. Hofstede GH, Hofstede GJ, Minkov M. *Cultures and organizations - software of the mind: intercultural cooperation and its importance for survival*. New York: McGraw-Hill; 2010.
111. Bahrami MA, Chalak M, Montazeralfaraj R, Dehghani Tafti A. Iranian nurses' perception of patient safety culture. *Iran Red Crescent Med J*. 2014 [cited 2017 Jan 2];16(4):e11894.
112. Carroll JS, Edmondson AC. Leading organisational learning in health care. *Qual Saf Health Care*. 2002 [cited 2013 May 1];11(1):51.
113. Blignaut AJ, Coetzee SK, Klopper HC. Nurse qualifications and perceptions of patient safety and quality of care in South Africa. *Nurs Health Sci*. 2014 [cited 2017 Jan 3];16(2):224-231.
114. Cooke DL, Dunscombe PB, Lee RC. Using a survey of incident reporting and learning practices to improve organisational learning at a cancer care centre. *Qual Saf Health Care*. 2007 [cited 2013 Mar 2];16(5):342-8.
115. Hajimohammadi N, deghi T, Hosseini SH. Evaluating the effect of an educational intervention for nursing managers on the rate of incidents reported at University Hospitals of Iran. *Hosp Top*. 2018 [cited 2018 Mar 17]:1-7.
116. Jia PL, Zhang LH, Zhang MM, Zhang LL, Zhang C, Qin SF, et al. Safety culture in a pharmacy setting using a pharmacy survey on patient safety culture: a cross-sectional study in China. *BMJ Open*. 2014 [cited 2017 Feb 13];4(6).
117. Kaldjian LC, Jones EW, Wu BJ, Forman-Hoffman VL, Levi BH, Rosenthal GE. Reporting medical errors to improve patient safety: a survey of physicians in teaching hospitals. *Arch Intern Med*. 2008 [cited 2013 Jan 28];168(1):40-46.
118. Flotta D, Rizza P, Bianco A, Pileggi C, Pavia M. Patient safety and medical errors: knowledge, attitudes and behavior among Italian hospital physicians. *Int J Qual Health Care*. 2012 [cited 2015 Jan 27];24(3):258-265.
119. Waters NF, Hall WA, Brown H, Espezel H, Palmer L. Perceptions of Canadian labour and delivery nurses about incident reporting: a qualitative descriptive focus group study. *Int J Nurs Stud*. 2012 Jul [cited 2015 Mar 17];49(7):811-821.
120. Potylycki MJ, Kimmel SR, Ritter M, Capuano T, Gross L, Riegel-Gross K, et al. Nonpunitive medication error reporting: 3-year findings from one hospital's Primum Non Nocere initiative. *J Nurs Adm*. 2006 Jul-Aug [cited 2016 Aug 1];36(7-8):370-376.



121. Hartnell N, MacKinnon N, Sketris I, Fleming M. Identifying, understanding and overcoming barriers to medication error reporting in hospitals: a focus group study. *BMJ Qual Saf* 2012 [cited 2016 Oct 3];21(5):361-368.
122. Al-Nawafleh A, Abu-Helalah MA, Hill V, Masoud M, Al-Mahasneh H, Al Salti E. Patient safety culture in Jordanian hospitals. *Health Science Journal*. 2016 [cited 2017 Mar 27];10(5:5):1-6.
123. Armellino D, Quinn Griffin MT, Fitzpatrick JJ. Structural empowerment and patient safety culture among registered nurses working in adult critical care units. *J Nurs Manag*. 2010 [cited 2015 Jan 15];18(7):796-803.
124. Pringle J, Weber RJ, Rice K, Kirisci L, Sirio C. Examination of how a survey can spur culture changes using a quality improvement approach: a region-wide approach to determining a patient safety culture. *Am J Med Qual*. 2009 Sep-Oct [cited 2017 Aug 10];24(5):374-384.
125. Farzi S, Moladoost A, Bahrami M, Farzi S, Etminani R. Patient safety culture in intensive care units from the perspective of nurses: a cross-sectional study. *Iran J Nurs Midwifery Res*. 2017 Sep-Oct [cited 2017 Nov 14];22(5):372-376.
126. Gagnon M-P, Payne-Gagnon J, Fortin J-P, Paré G, Côté J, Courcy F. A learning organization in the service of knowledge management among nurses: A case study. *IJIM*. 2015 [cited 2017 May 13];35(5):636-642.
127. Clark BG, Brown RJ, Ploquin J, Dunscombe P. Patient safety improvements in radiation treatment through 5 years of incident learning. *Pract Radiat Oncol*. 2013 [cited 2016 Jan 27];3(3):157-163.
128. Benn J, Koutantji M, Wallace L, Spurgeon P, Rejman M, Healey A, et al. Feedback from incident reporting: information and action to improve patient safety. *Qual Saf Health Care*. 2009 [cited 2016 Dec 3];18(1):11-23.
129. Harrison R, Cohen AW, Walton M. Patient safety and quality of care in developing countries in Southeast Asia: a systematic literature review. *Int J Qual Health Care*. 2015 Aug [cited 2017 Dec 3];27(4):240-254.
130. Gillespie BM, Gwinner K, Chaboyer W, Fairweather N. Team communications in surgery - creating a culture of safety. *J Interprof Care*. 2013 [cited 2017 May 30];27(5):387-393.
131. Kagan I, Barnoy S. Organizational safety culture and medical error reporting by Israeli nurses. *J Nurs Scholarsh*. 2013 [cited 2016 Jun 2];45(3):273-280.
132. Nagpal K, Vats A, Lamb B, Ashrafian H, Sevdalis N, Vincent C, et al. Information transfer and communication in surgery: a systematic review. *Ann Surg*. 2010 [cited 2017 May 30];252(2):225-239.
133. Rabøl LI, Andersen ML, Ostergaard D, Bjorn B, Lilja B, Mogensen T. Descriptions of verbal communication errors between staff. An analysis of 84 root cause analysis-reports from Danish hospitals. *BMJ Qual Saf*. 2011 [cited 2017 May 30];20(3):268-674.
134. Sutcliffe K, Lewton E, Rosenthal M. Communication failures: an insidious contributor to medical mishaps. *Acad Med*. 2004 [cited 2013 Dec 23];79(2):186-194.

135. Flin R, Fletcher G, McGeorge P, Sutherland A, Patey R. Anaesthetists' attitudes to teamwork and safety. *Anaesthesia*. 2003 [cited 2015 Dec 17];58(3):233-242.
136. Almutairi KM. Culture and language differences as a barrier to provision of quality care by the health workforce in Saudi Arabia. *Saudi Med J*. 2015 [cited 2017 Jul 12];36(4):425-431.
137. Eggins S, Slade D. Communication in clinical handover: improving the safety and quality of the patient experience. *J Public Health Res*. 2015 [cited 2017 Oct 10];4(666).
138. Reader TW, Flin R, Mearns K, Cuthbertson BH. Interdisciplinary communication in the intensive care unit. *BJA*. 2007 [cited 2017 Jun 11];98(3):347-352.
139. Braaf S, Manias E, Finch S, Riley R, Munro F. Healthcare service provider perceptions of organisational communication across the perioperative pathway: a questionnaire survey. *J Clin Nurs*. 2013 [cited 2017 Nov 13];22(1-2):180-191.
140. Garon M. Speaking up, being heard: registered nurses' perceptions of workplace communication. *J Nurs Manag*. 2012 [cited 2015 Apr 2];20(3):361-371.
141. Clark E, Squire S, Heyme A, Mickle ME, Petrie E. The PACT project: improving communication at handover. *Med J Aust*. 2009 [cited 2017 May 27 ];190(11 Suppl):125-127.
142. Ballangrud R, Hedelin B, Hall-Lord ML. Nurses' perceptions of patient safety climate in intensive care units: a cross-sectional study. *Intensive Crit Care Nurs*. 2012 [cited 2015 Feb 10];28(6):344-354.
143. Eggins S, Slade D. Communication in clinical handover: improving the safety and quality of the patient experience. *J Public Health Res*. 2015 [cited 2017 Apr 1];4(666):197-199.
144. Wong M, Yee K, Turner P. A structured evidence-based literature review regarding the effectiveness of improvement interventions in clinical handover [Internet]. The eHealth Services Research Group, University of Tasmania, for the Australian Commission on Safety and Quality in Health Care (ACSQHC); 2008 [cited 2016 Aug 17]. Available from: <https://www.safetyandquality.gov.au/wp-content/uploads/2008/01/Clinical-Handover-Literature-Review-for-release.pdf>
145. American Hospitals Association. Fast fact [Internet]. AHA; 2015 [cited 2016 Jun 10]. Available from: <http://www.aha.org/research/rc/stat-studies/fast-facts.shtm>
146. Health & Social Care Information Centr. Hospital episode statistics, admitted patient care 2012–2011 [Internet]. HSCIC; 2013 [cited 2016 Jun 20]. Available from: <https://digital.nhs.uk/catalogue/PUB12566>
147. Organisation for economic co-operation and developme. Health care utilisation: hospital aggregates [Internet]. OECD; 2011 [cited 2016 Jun 17]. Available from: <http://stats.oecd.org/index.asp>
148. Bost N, Crilly J, Wallis M, Patterson E, Chaboyer W. Clinical handover of patients arriving by ambulance to the emergency department - a literature review. *Int Emerg Nurs*. 2010 [cited 2017 May 1];18(4):210-220.

149. Siemsen IM, Madsen MD, Pedersen LF, Michaelsen L, Pedersen AV, Andersen HB, et al. Factors that impact on the safety of patient handovers: an interview study. *Scand J Public Health*. 2012 [cited 2017 May 10];40(5):439-448.
150. Pezzolesi C, Manser T, Schifano F, Kostrzewski A, Pickles J, Harriet N, et al. Human factors in clinical handover: development and testing of a 'handover performance tool' for doctors' shift handovers. *Int J Qual Health Care*. 2013 [cited 2017 May 17];25(1):58-65.
151. Nagpal K, Abboudi M, Manchanda C, Vats A, Sevdalis N, Bicknell C, et al. Improving postoperative handover: a prospective observational study. *Am J Surg*. 2013 [cited 2017 May 13];206(4):494-501.
152. Shie H-G, Lee W-C, Hsiao H-F, Lin H-L, Yang L-L, Jung F. Patient safety attitudes among respiratory therapists in taiwan. *Respir Care*. 2011 [cited 2015 Feb 2];56(12):1924.
153. Babiker A, El Hussein M, Al Nemri A, Al Frayh A, Al Juryyan N, Faki MO, et al. Health care professional development: Working as a team to improve patient care. *Sudan J Paediatr*. 2014 [cited 2017 Apr 7];14(2):9-16.
154. O'Daniel M, Rosenstein AH. Professional communication and team collaboration. In: Hughes RG, editor. *Patient safety and quality: an evidence-based handbook for nurses*. Rockville, MD: The Agency for Healthcare Research and Quality; 2008 Apr.
155. Manser T. Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. *Acta Anaesthesiol Scand*. 2009 [cited 2017 Aug 13];53(2):143-151.
156. McCulloch P, Mishra A, Handa A, Dale T, Hirst G, Catchpole K. The effects of aviation-style non-technical skills training on technical performance and outcome in the operating theatre. *Qual Saf Health Care*. 2009 [cited 2017 Aug 19];18(2):109-115.
157. Clements D, Dault M, Priest A. Effective teamwork in healthcare: research and reality. *Healthc Pap*. 2007 [cited 2017 Aug 23];7 Spec No:26-34.
158. Bristowe K, Siassakos D, Hambly H, Angouri J, Yelland A, Draycott TJ, et al. Teamwork for clinical emergencies: interprofessional focus group analysis and triangulation with simulation. *Qual Health Res*. 2012 Oct [cited 2017 July 20];22(10):1383-94.
159. Hwang J-I, Ahn J. Teamwork and clinical error reporting among nurses in Korean hospitals. *Asian Nurs Res*. 2015 [cited 2017 Jun 11];9(1):14-20.
160. Saleh AM, Darawad MW, Al-Hussami M. The perception of hospital safety culture and selected outcomes among nurses: an exploratory study. *Nurs Health Sci*. 2015 [cited 2017 Jun 30];17(3):339-46.
161. Freytag J, Stroben F, Hautz WE, Eisenmann D, Kämmer JE. Improving patient safety through better teamwork: how effective are different methods of simulation debriefing? Protocol for a pragmatic, prospective and randomised study. *BMJ Open*. 2017 [cited 2017 Aug 27];7(6).
162. Weller J, Boyd M, Cumin D. Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. *Postgrad Med J*. 2014 [cited 2017 Jun 10];90(1061):149-154.

163. Lambrou P, Papastavrou E, Merkouris A, Middleton N. Professional environment and patient safety in emergency departments. *Int Emerg Nurs*. 2015 [cited 2017 May 10];23(2):150-155.
164. 32, Jafree SR, Zakar R, Zakar MZ, Fischer F. Assessing the patient safety culture and ward error reporting in public sector hospitals of Pakistan. *Safety in Health [journal article]*. 2017 September 04 [cited 2017 Dec 12];3(1):10.
165. Elsheikh AM, AlShareef MA, Saleh BS, El-Tawansi MAY. Assessment of patient safety culture: a comparative case study between physicians and nurses. *Business Process Management Journal*. 2017 [cited 2017 Nov 13];23(4):792-810.
166. Tereanu C, Sampietro G, Sarnataro F, Mazzoleni G, Pesenti B, Sala LC, et al. Exploring patient safety culture in preventive medicine settings: an experience from Northern Italy. *J Prev Med Hyg*. 2017 [cited 2017 Nov 20];58(2):E121-E129.
167. Tubbs-Cooley HL, Cimiotti JP, Silber JH, Sloane DM, Aiken LH. An observational study of nurse staffing ratios and hospital readmission among children admitted for common conditions. *BMJ Qual Saf* 2013 [cited 2017 May 7].
168. Smeds Alenius L, Tishelman C, Runesdotter S, Lindqvist R. Staffing and resource adequacy strongly related to RNs' assessment of patient safety: a national study of RNs working in acute-care hospitals in Sweden. *BMJ Qual Saf* 2013 [cited 2017 May 1]:1-8.
169. Ball JE, Murrells T, Rafferty AM, Morrow E, Griffiths P. 'Care left undone' during nursing shifts: associations with workload and perceived quality of care. *BMJ Qual Saf* 2013 [cited 2017 Jun 21]:1-10.
170. Cimiotti JP, Aiken LH, Sloane DM, Wu ES. Nurse staffing, burnout, and health care-associated infection. *Am J Infect Control*. 2012 [cited 2017 Jun 13];40(6):486-490.
171. Al-Kandari F, Thomas D. Perceived adverse patient outcomes correlated to nurses' workload in medical and surgical wards of selected hospitals in Kuwait. *J Clin Nurs*. 2009 [cited 2017 Jun 14];18(4):581-590.
172. Chakravarty A, Sahu A, Biswas M, Chatterjee K, Rath S. A study of assessment of patient safety climate in tertiary care hospitals. *Med J Armed Forces India*. 2015 [cited 2017 May 12];71(2):152-157.
173. Khater WA, Akhu-Zaheya LM, Al-Mahasneh SI, Khater R. Nurses' perceptions of patient safety culture in Jordanian hospitals. *Int Nurs Rev*. 2015 [cited 2015 Dec 12];62(1):82-91.
174. Park SA, Lee SJ, Choi GU. Survey of factors associated with nurses' perception of patient safety. *Asian Pac J Cancer Prev*. 2011 [cited 2014 Feb 2];12(8):2129-32.
175. Top M, Tekingündüz S. Patient safety culture in a Turkish public hospital: a study of nurses' perceptions about patient safety. *Systemic Practice and Action Research [journal article]*. 2015 April 01 [cited 2015 Dec 17];28(2):87-110.
176. Luiz RB, Simoes AL, Barichello E, Barbosa MH. Factors associated with the patient safety climate at a teaching hospital. *Rev Latino Am Enfermagem*. 2015 [cited 2017];23(5):880-887.

177. Ban KA, Chung JW, Matulewicz RS, Kelz RR, Shea JA, Dahlke AR, et al. Gender-based differences in surgical residents' perceptions of patient safety, continuity of care, and well-being: an analysis from the Flexibility in Duty Hour Requirements for Surgical Trainees (FIRST) trial. *J Am Coll Surg*. 2017 [cited 2017 Dec 27];224(2):126-136 e2.
178. Wagner LM, Brush BL, Castle NG, Engberg JB, Capezuti EA. Nursing home patient safety culture perceptions among US and immigrant Nurses. *J Patient Saf*. 2017 [cited 2017 Nov 12];4:doi: 10.1097/PTS.
179. Labat F, Sharma A. Qualitative study exploring surgical team members' perception of patient safety in conflict-ridden Eastern Democratic Republic of Congo. *BMJ Open*. 2016 [cited 2016 Oct 13];6(4).
180. Khater WA, Akhu-Zaheya LM, Al-Mahasneh SI, Khater R. Nurses' perceptions of patient safety culture in Jordanian hospitals. *Int Nurs Rev*. 2015 [cited 2016 Apr 5];62(1):82-91.
181. Holden LM, Watts DD, Hinton Walker P. Patient safety climate in primary care: age matters. *J Patient Saf*. 2009 Mar [cited 2017 May 27];5(1):23-28.
182. Raftopoulos V, Pavlakis A. Safety climate in 5 intensive care units: a nationwide hospital survey using the Greek-Cypriot version of the safety attitudes questionnaire. *J Crit Care*. 2013 [cited 2017 May 22];28(1):51-61.
183. Haugen AS, Sjøfteland E, Eide GE, Nortvedt MW, Aase K, Harthug S. Patient safety in surgical environments: Cross-countries comparison of psychometric properties and results of the Norwegian version of the Hospital Survey on Patient Safety. *BMC Health Serv Res*. 2010 [cited 2016 May 13];10(1):279.
184. Feng X, Bobay K, Krejci JW, McCormick BL. Factors associated with nurses' perceptions of patient safety culture in China: a cross-sectional survey study. *J Evid Based Med*. 2012 [cited 2016 Jun 8];5(2):50-56.
185. Durani P, Dias J, Singh HP, Taub N. Junior doctors and patient safety: evaluating knowledge, attitudes and perception of safety climate. *BMJ Qual Saf*. 2013 [cited 2016 Jul 10];22(1):65-71.
186. In-Sook K, MiJeong P, Mi-Young P, Yoo H, Choi J. Factors affecting the perception of importance and practice of patient safety management among hospital employees in Korea. *Asian Nurs Res*. 2013 [cited 2015 Feb 12];7(1):26-32.
187. Shaw KN, Ruddy RM, Olsen CS, Lillis KA, Mahajan PV, Dean JM, et al. Pediatric patient safety in emergency departments: unit characteristics and staff perceptions. *Pediatrics*. 2009 [cited 2016 Dec 2];124(2):485-493.
188. Parry G, Horowitz L, Goldmann D. Patient safety attitudes of paediatric trainee physicians. *Qual Saf Health Care*. 2009 Dec;18(6):462-466.
189. El-Gendi S, Seung H, Abdelsamie S, Feemster A. Assessment of patient safety culture among Egyptian healthcare employees. *Med Saf Glob Health*. 2017 [cited 2017 Nov 28];6(134):Doi: 10.4172/2574.
190. Merino-Plaza MJ, Carrera-Hueso FJ, Roca-Castello MR, Morro-Martin MD, Martinez-Asensi A, Fikri-Benbrahim N. Relationship between job satisfaction and patient safety culture. *Gac Sanit*. 2017 [cited 2016 May 7];17(30):102-114.

191. Ashkanasy NM, Wilderom CPM, Peterson ME. Handbook of organizational culture and climate. Thousand Oaks, CA: Sage; 2000.
192. Creswell JW, Plano Clark VL. Designing and conducting mixed methods research. 2nd ed. Los Angeles: Sage Publications; 2011.
193. Kathleen MTC, Anthony JO, Qun GJ. A mixed methods investigation of mixed methods sampling designs in social and health science research. *J Mix Methods Res.* 2007 [cited 2015 Jul 13];1(3):267-294.
194. Johnson RB, Onwuegbuzie AJ, Turner LA. Toward a definition of mixed methods research. *J Mix Methods Res.* 2007 [cited 2016 May 2];1(2):112-133.
195. Hodgen A EL, Churruca K BM. Safety culture assessment in health care: a review of the literature on safety culture assessment modes [Internet]. Sydney; 2017 [cited 2017 May 27]. Available from: <https://www.safetyandquality.gov.au/wp-content/uploads/2017/10/Safety-Culture-Assessment-in-Health-Care-A-review-of-the-literature-on-safety-culture-assessment-modes.pdf>
196. Polit DF, Beck CT. Nursing research : Generating and assessing evidence for nursing practice. Philadelphia: Wolters Kluwer Health, Lippincott Williams & Wilkins; 2008.
197. Setia MS. Methodology series module 3: cross-sectional studies. *Indian J Dermatol.* 2016 [cited 2017 Jan 5];61(3):261-264.
198. Tashakkori A, Teddlie C. Sage handbook of mixed methods in social & behavioral research. 2nd ed. Los Angeles: Sage Publications; 2010.
199. De Vaus DA. Research design in social research. London: Sage; 2001.
200. Gorard S, Taylor C. Quantitative methods in social science. New York; London: Continuum; 2003.
201. Nardi PM. Doing survey research: a guide to quantitative methods. Boston, MA: Allyn and Bacon; 2003.
202. Bowling A. Research methods in health: investigating health and health services. 4th ed. London: Saffron House; 2009.
203. Oppenheim A. Questionnaire design, interviewing and attitude measurement. London: Pinter; 2001.
204. Sekaran U. Research methods for business: a skill building approach. New Yourl: Prentice Hal; 2000.
205. Crano WD, Brewer MB. Principles and methods of social research. Texas: Lawrence Erlbaum Associates; 2002.
206. Sorra J, Nieva V. Hospital survey on patient safety culture. Agency for healthcare research and quality [Internet]. 2004 [cited 2014 Mar 10]. Available from: [www.ahrq.gov/qual/patientsafetyculture/hospcult.pd](http://www.ahrq.gov/qual/patientsafetyculture/hospcult.pd)
207. Sorra JS, Dyer N. Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. *BMC Health Serv Res* [journal article]. 2010 [cited 2014 Oct 10];10(1):199-203.

208. Najjar S, Hamdan M, Baillien E, Vleugels A, Euwema M, Sermeus W, et al. The Arabic version of the hospital survey on patient safety culture: a psychometric evaluation in a Palestinian sample. *BMC Health Serv Res.* 2013 [cited 2016 Apr 17];13:193-201.
209. Rubin RB, Rubin AM, Haridakis PM, Piele LJ. *Communication research: strategies and sources.* 7th ed. Boston: Cengage Learning; 2009.
210. Organization. WH. Process of translation and adaptation of instruments [Internet]. WHO; 2012 [cited 2015 Feb 10]. Available from: [http://www.who.int/substance\\_abuse/research\\_tools/translation/en/](http://www.who.int/substance_abuse/research_tools/translation/en/)
211. Lynn MR. Determination and quantification of content validity. *J Nurs Res.* 1986 [cited 2014 Apr 3];35(6):382-386.
212. Jones M, Rattray J. Questionnaire design. In: Gerrish K, Lacey A, editors. *The research process in nursing.* Hoboken: Wiley; 2013.
213. Streiner D, Norman G. *Health measurement scales. a practical guide to their development and use.* New York: Oxford University Press; 2003.
214. Day G. *Nurse morale plummets in Queensland.* [Armidale]: University of New England; 2005 [cited 2015 Feb 17].
215. Schmidt AF, Finan C. Linear regression and the normality assumption. *J Clin Epidemiol.* 2017 [cited 2017 Dec 28];98:146-151.
216. Pallant J. *SPSS survival manual, a step by step guide to data analysis using SPSS for windows.* 3rd ed. Sydney: McGraw-Hill Education; 2006.
217. Cronk B. *How to use SPSS: a step-by-step guide to analysis and interpretation.* 9th ed. London: Routledge; 2017.
218. Altman DG, Bland JM. Statistics notes: The normal distribution. *BMJ.* 1995 [cited 2015 May 27];310(6975):298.
219. Coakes SJ, Steed L, Ong C. *SPSS Version 17.0 for windows: analysis without anguish.* Milton: Jon Wiley & Sons Australia, Ltd.; 2010.
220. Hair J, Anderson R, Babin B, Tatman R, Black W. *Multivariate data analysis: a global perspective.* 7th ed. Upper Saddle River, N.J. London: Pearson Education; 2012.
221. Tabachnick BG, Fidell LS. *Using multivariate statistics.* 5th ed. Boston: Pearson/Allyn & Bacon; 2007.
222. Allen MJ, Yen WM. *Introduction to measurement theory.* Long Grove, IL: Waveland Press; 2002.
223. Field AP. *Discovering statistics using SPSS.* 3rd ed. London: Sage; 2009.
224. Vacha-Haase T. Statistical significance should not be considered one of life's guarantees: effect sizes are needed. *Educ Psychol Meas.* 2001 [cited 2014 May 27];61(2):219-224.
225. Lomax RG. *An introduction to statistical concepts.* Philadelphia: Taylor & Francis; 2007.
226. Mertler CA, Vannatta RA. *Advanced and multivariate statistical methods.* Los Angeles: Pycszak Publishing; 2004.

227. McKim CA. The value of mixed methods research: a mixed methods study. *J Mix Methods Res.* 2015 [cited 2015 Dec 21];11(2):202-222.
228. Courtney AM. The value of mixed methods research. *J Mix Methods Res.* 2017 [cited 2017 Jul 22];11(2):202-222.
229. Rossman GB, Rallis SF. *Learning in the field: an introduction to qualitative research.* Thousand Oaks: Sage; 2003.
230. Creswell JW. *Research design: qualitative, quantitative and mixed methods approaches.* 4th ed. Los Angeles: Sage; 2014.
231. Merriam SB. *Qualitative research: a guide to design and implementation.* San Francisco, CA: Jossey-Bass.; 2009.
232. Schensul JJ. Methodology, methods, and tools in qualitative research. In: Lapan SD, Quartaroli MT, Riemer FJ, editors. *Qualitative research to methods and designs.* A Wiley Imprint: Jossey-Bass; 2012.
233. Marshall C, Rossman GB. *Designing qualitative research.* 5th ed. Los Angeles: Sage; 2011.
234. Jeasik C, Allen T. Validity in qualitative research revisited. *Qualitative Research.* 2006 [cited 2017 May 7];6(3):319-340.
235. Lincoln YS, Guba EG. *Naturalistic inquiry.* Newbury Park, CA: SAGE Publications; 1985.
236. Patton MQ. *Qualitative evaluation and research methods.* Thousand Oaks, CA: Sage Publications, inc; 1990.
237. Green J, Thorogood N. *Qualitative methods of health research.* London: Sage Publications; 2004.
238. Burns N, Grove SK. *The practice of nursing research: conduct, critique, and utilization.* 5th ed. St Louis: Elsevier Saunders; 2005.
239. Padgett D. *Qualitative and mixed methods in public health.* Thousand Oaks, Calif.: Sage; 2012.
240. Onwuegbuzie AJ, Combs JP. Data analysis in mixed research: A primer. *Int J Edu.* 2011 [cited 2017 Jun 1];3(1):13-19.
241. Teddlie C, Tashakkori A. *Foundations of mixed methods research : integrating quantitative and qualitative approaches in the social and behavioral sciences.* Thousand Oaks: Sage Publications; 2009.
242. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006 [cited 2016 May 1];3(2):77-101.
243. Halai N. Making use of bilingual interview data: some experiences from the field. *Qual Rep.* 2007 [cited 2016 Jul 3];12(3):345-355.
244. Seidman IE. *Interviewing as qualitative research: a guide for researchers in education and the social sciences.* New York: Teachers College Press; 1991.
245. Noble H, Smith J. Issues of validity and reliability in qualitative research. *Evidence Based Nursing.* 2015 [cited 2015 December 2];18(2):34.



246. Linda B, Suzanne S, Debbie C, Christine C, Fiona W. Member checking: a tool to enhance trustworthiness or merely a nod to validation? *Qual Health Res.* 2016 [cited 2015 Dec 3];26(13):1802-1811.
247. Lincoln YS, Guba EG. *Naturalistic inquiry.* Beverly Hills, CA: Sage; 1985.
248. Sandelowski M. The problem of rigor in qualitative research. *ANS Adv Nurs Sci.* 1986 [cited 2017 Jun 27];8(3):27-37.
249. Krefting L. Rigor in qualitative research: the assessment of trustworthiness. *Am J Occup Ther.* 1991 [cited 2017 Jul 24];45(3):214-222.
250. Korstjens I, Moser A. Series: Practical guidance to qualitative research. Part 4: trustworthiness and publishing. *Eur J Gen Pract.* 2018 [cited 2018 May 29];24(1):120-124.
251. Cohen J. *Statistical power analysis for the behavioral sciences.* 2nd ed. New Jersey, USA: Lawrence Erlbaum Associates; 1988.
252. Szumilas M. Explaining odds ratios. *J Can Acad Child Adolesc Psychiatry.* 2010 [cited 2018 Jan 4];19(3):227-229.
253. Murphy JG, Dunn WF. Medical errors and poor communication. *Chest.* [cited 2018 Jan 28];138(6):1292-1293.
254. Akkirman AD, Harris DL. Organizational communication satisfaction in the virtual workplace. *IJMD.* 2005 [cited 2018 Mar 3];24(5):397-409.
255. Shuster S. Staff recognition and appreciation. *J Oncol Pract.* 2007 [cited 2017 Dec 2];3(1):100-103.
256. Debra AB, Constance LM. Nurses' experiences of feeling respected—not respected. *Nurs Sci Q.* 2009 [cited 2017 Dec 21];22(1):47-56.
257. Ardiphine RM. The loss of a "key person": Risk to the enterprise; how to manage it? . *JBM.* 2015 [cited 2018 Mar 7].
258. Honeycutt A. Maximising the employee productivity factor. *Int J Manpower.* 1989 [cited 2018 Mar 1];10(4):24-27.
259. Carayon P, Wetterneck TB, Rivera-Rodriguez AJ, Hundt AS, Hoonakker P, Holden R, et al. Human factors systems approach to healthcare quality and patient safety. *Appl Ergon.* 2014 [cited 2018 Mar 3];45(1):14-25.
260. Simone MK, Phyllis B, Eileen L. Effects of extended work shifts and shift work on patient safety, productivity, and employee health. *AAOHN J.* 2009 [cited 2018 Mar 7];57(12):497-504.
261. de Vries EN, Prins HA, Crolla RMPH, den Outer AJ, van Andel G, van Helden SH, et al. Effect of a comprehensive surgical safety system on patient outcomes. *N Engl J Med.* 2010 [cited 2018 Jan 22];363(20):1928-1937.
262. Weller J, Boyd M, Cumin D. Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. *Postgrad Med J.* 2014 [cited 2017 Jul 27];1(6):1-12.

263. Salas E, Rosen MA, King H. Managing teams managing crises: principles of teamwork to improve patient safety in the Emergency Room and beyond. *Theor Issues Ergon*. 2007 [cited 2017 Jul 27];8(5):381-394.
264. Beckett Cynthia D, Kipnis G. Collaborative communication: integrating sbar to improve quality/patient safety outcomes. *J Healthc Qual*. 2009 [cited 2017 Jul 30];31(5):19-28.
265. Walton M. Creating a “no blame” culture: have we got the balance right? *Qual Saf Health Care*. 2004 [cited 2016 Feb 17];13(3):163.
266. Mahjoub M, Bouafia N, Cheikh AB, Ezzi O, Njah M. Patient safety culture based on a non-punitive response to error and freedom of expression of healthcare professionals. *Sante Publique (Bucur)*. 2016 [cited 2017 May 15];28(5):641-646.
267. Institute of Medicine. Keeping patients safe: transforming the work environment of nurses [Internet]. Washington, DC: National Academy Press; 2004 [cited 2016 Apr 13]. Available from: <https://www.nap.edu/catalog/10851/keeping-patients-safe-transforming-the-work-environment-of-nurses>
268. Coyle YM, Mercer SQ, Murphy-Cullen CL, Schneider GW, Hynan LS. Effectiveness of a graduate medical education program for improving medical event reporting attitude and behavior. *Qual Saf Health Care*. 2005 [cited 2017 May 8];14(5):383-390.
269. Ginsburg L, Norton PG, Casebeer A, Lewis S. An educational intervention to enhance nurse leaders' perceptions of patient safety culture. *Health Serv Res*. 2005 [cited 2016 Jun 29];40(4):997-1020.
270. Pronovost PJ, Weast B, Holzmueller CG, Rosenstein BJ, Kidwell RP, Haller KB, et al. Evaluation of the culture of safety: survey of clinicians and managers in an academic medical center. *Qual Saf Health Care*. 2003 [cited 2016 May 13];12(6):405-410.
271. Sorra J, Nieva V, Famolaro T, Dyer N. Hospital survey on patient safety culture: 2007 comparative database report [Internet]. Rockville, MD; 2007 [cited 2016 Aug 12]. Report No.: AHRQ Publication No. 07-0025. Available from: <https://archive.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/2007/hospdbch5.html>
272. Long DE. Culture and customs of Saudi Arabia. Greenwood Press; 2005.
273. Hillen H, Pfaff H, Hammer A. The association between transformational leadership in German hospitals and the frequency of events reported as perceived by medical directors. *J Safety Res*. 2017 [cited 2017 Nov 27];20(4):499-515.
274. Ribeliene J, Blazevičienė A, Nadisauskienė RJ, Tameliene R, Kudrevičienė A, Nedzelskiene I, et al. Patient safety culture in obstetrics and gynecology and neonatology units: the nurses' and the midwives' opinion. *J Matern Fetal Neonatal Med*. 2018 [cited 2018 May 20]:1-7.
275. Chen IC, Li H-H. Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture. *BMC Health Serv Res*. 2010 [cited 2017 Dec 19];10:152-152.
276. Verbakel NJ, Van Melle M, Langelaan M, Verheij TJ, Wagner C, Zwart DLM. Exploring patient safety culture in primary care. *Int J Qual Health Care*. 2014 [cited 2016 May 28]:1-7.

277. Lawton R, Hara JK, Sheard L, Reynolds C, Cocks K, Armitage G, et al. Can staff and patient perspectives on hospital safety predict harm-free care? An analysis of staff and patient survey data and routinely collected outcomes. *BMJ Qual Saf* 2015 [cited 2017 Jun 4];24(6):369.
278. El-Jardali F, Jaafar M, Dimassi H, Jamal D, Hamdan R. The current state of patient safety culture in Lebanese hospitals: a study at baseline. *Int J Qual Health Care*. 2010 Oct [cited 2017 May 13];22(5):386-95.
279. El-Jardali F, Dimassi H, Jamal D, Jaafar M, Hemadeh N. Predictors and outcomes of patient safety culture in hospitals. *BMC Health Serv Res*. 2011 [cited 2017 Aug 14];11:45.
280. Aboul-Fotouh AM, Ismail NA, EzElarab HS, Wassif GO. Assessment of patient safety culture among health-care providers at a teaching hospital in Cairo, Egypt. *Eastern Mediterranean Health Journal*. 2012 [cited 2015 Jan 27];18(4):372-7.
281. Ammouri AA, Tailakh AK, Muliira JK, Geethakrishnan R, Al Kindi SN. Patient safety culture among nurses. *Int Nurs Rev*. 2015 [cited 2017 Jul 17];62(1):102-110.
282. Ardoin K, Wilson K. Cultural diversity: what role does it play in patient safety? *Nurs Womens Health*. 2010 [cited 2016 May 13];14(4):322-326.
283. Bodur S, Filiz E. A survey on patient safety culture in primary healthcare services in Turkey. *Int J Qual Health Care*. 2009 [cited 2013 Jun 2];21(5):348-355.
284. Ugurluoglu O, Ugurluoglu E, Payziner PD, Ozatkan Y. Patient safety culture: sample of a university hospital in Turkey. *PaK J Med Sci*. 2012 [cited 2016 May 28];28(2):463-467.
285. Elsous A, Akbari Sari A, AlJeesh Y, Radwan M. Nursing perceptions of patient safety climate in the Gaza Strip, Palestine. *Int Nurs Rev*. 2017 [cited 2018 Jan 10].
286. Edmondson AC. Learning from failure in health care: frequent opportunities, pervasive barriers. *Qual Saf Health Care*. 2004 [cited 2017 Jul 8];13(suppl 2):ii3.
287. Rafter N, Hickey A, Condell S, Conroy R, O'Connor P, Vaughan D, et al. Adverse events in healthcare: learning from mistakes. *QJM*. 2015 [cited 2017 May 2];108(4):273-7.
288. Leape LL. Errors in medicine. *Clin Chim Acta*. 2009 [cited 2017 May 3];404(1):2-5.
289. Sahebalzamani M, Mohammady M. A study of patient safety management in the framework of clinical governance according to the nurses working in the ICU of the hospitals in the East of Tehran. *Iran J Nurs Midwifery Res*. 2014 May-Jun [cited 2018 Apr 3];19(3):295-300.
290. AbuAlRub RF, Abu Alhijaa EH. The impact of educational interventions on enhancing perceptions of patient safety culture among Jordanian senior nurses. *Nurs Forum*. 2014 Apr-Jun [cited 2016 Sep 19];49(2):139-150.
291. Arastoo H, Hakimovich AP, Esfandiarpour S. Assessment of barriers to establish OSH: a country report. *Ind Health*. 2015 [cited 2016 Jun 18];53(4):378-384.
292. Weaver SJ, Lubomksi LH, Wilson RF, Pfoh ER, Martinez KA, Dy SM. Promoting a culture of safety as a patient safety strategy: a systematic review. *Ann Intern Med*. 2013 [cited 2018 Jan 28];158(502):369-374.
293. Reiling JG. *Creating a Culture of Patient Safety Through Innovative Hospital Design*. Carolyn Clancy, MD: AHRQ & Defense Technical Information Center; 2005.

294. Reason J. Human error: models and management. *BMJ*. 2000 [cited 2016 Aug 2];320(7237):768-770.
295. Dirik HF, Intepeler SS. The work environment and empowerment as predictors of patient safety culture in Turkey. *J Nurs Manag*. 2017 [cited 2018 Jan 17];25(4):256-265.
296. Elsous A, Akbari Sari A, Rashidian A, Aljeesh Y, Radwan M, AbuZaydeh H. A cross-sectional study to assess the patient safety culture in the Palestinian hospitals: a baseline assessment for quality improvement. *JRSM Open*. 2016 [cited 2017 Feb 2];7(12):1-12.
297. Sivanandy P, Maharajan MK, Rajiah K, Wei TT, Loon TW, Yee LC. Evaluation of patient safety culture among Malaysian retail pharmacists: results of a self-reported survey. *Patient Prefer Adherence*. 2016 [cited 2017 Jun 10];10:1317-25.
298. El Taguri A, Elkhammas E, Bakoush O, Ashammakhi N, Baccoush M, Betilmal I. Libyan National Health services the need to move to management-by-objectives. *Libyan J Med*. 2008 [cited 2017 Sep 22];3(2):113-121.
299. Zohar D, Luria G. The use of supervisory practices as leverage to improve safety behavior: a cross-level intervention model. *J Safety Res*. 2003 [cited 2017 Mar 27];34(5):567-77.
300. Elmontsri M, Almashrafi A, Banarsee R, Majeed A. Status of patient safety culture in Arab countries: a systematic review. *BMJ Open*. 2017 [cited 2017 Dec 7];7(2):e013487.
301. Rajalatchumi A, Ravikumar TS, Muruganandham K, Thulasingham M, Selvaraj K, Reddy MM, et al. Perception of patient safety culture among health-care providers in a tertiary care hospital, South India. *J Nat Sci Biol Med*. 2018 Jan-Jun [cited 2018 Apr 17];9(1):14-18.
302. MacKay RC, Matsuno K, Mulligan J. Communication problems between doctors and nurses. *Int J Qual Health Care*. 1991 [cited 2016 Jul 7];3(1):11-19.
303. Veatch RM. The place of care in ethical theory. *J Med Philos*. 1998 [cited 2014 May 11];23(2):210-224.
304. Kaufert JM, Koolage WW, Kaufert PL, O'Neil JD. The use of "trouble case" examples in teaching the impact of sociocultural and political factors in clinical communication. *Med Anthropol*. 1984 [cited 2016 May 13];8(1):36-45.
305. Kaissi A, Johnson T, Kirschbaum MS. Measuring teamwork and patient safety attitudes of high-risk areas. *Nurs Econ*. 2003 Sep-Oct [cited 2017 May 10];21(5):211- 227.
306. Woods D, Holl J, Angst D. Improving clinical communication and patient safety: clinician-recommended solutions. In: Henriksen K, Battles J, Keyes M, editors. *Advances in patient safety: new directions and alternative approaches*. Rockville MD: AHRQ, USA; 2008.
307. Joint Commission journal on quality and patient safety. *The Joint Commission Journal on Quality and Patient Safety* [Internet]. Oak Brook, Illinois. USA: Joint Commission; 2018 [cited 2018 Apr 13]. Available from: [www.jointcommission.org](http://www.jointcommission.org)
308. Kesten KS. Role-play using SBAR technique to improve observed communication skills in senior nursing students. *J Nurs Educ*. 2011 [cited 2017 May 7];50(2):79-87.
309. Coiera E. When conversation is better than computation. *JAMIA*. 2000 May-Jun [cited 2017 May 7];7(3):277-286.

310. Bogenstätter Y, Tschan F, Semmer NK, Spychiger M, Breuer M, Marsch S. How accurate is information transmitted to medical professionals joining a medical emergency? A simulator study. *Hum Factors*. 2009 [cited 2017 May 7];51(2):115-125.
311. Kondro W. Canadian report quantifies cost of medical errors. *The Lancet*. 2004 [cited 2017 May 17];363(June 19):2059-2063.
312. Abdi Z, Delgoshaei B, Ravaghi H, Abbasi M, Heyrani A. The culture of patient safety in an Iranian intensive care unit. *J Nurs Manag*. 2015 [cited 2017 May 27];23(3):333-345.
313. Jorm CM, White S, Kaneen T. Clinical handover: critical communications. *Med J Aust*. 2009 [cited 2018 Apr 29];190(11):108-110.
314. El-Jardali F, Sheikh F, Garcia NA, Jamal D, Abdo A. Patient safety culture in a large teaching hospital in Riyadh: baseline assessment, comparative analysis and opportunities for improvement. *BMC Health Serv Res*. 2014 [cited 2017 May 2];14:122-123.
315. Zurn PPM, Stilwell B, A. Imbalances in the health workforce. Briefing paper. World Health Organization. Evidence and information for policy [Internet]. Geneva: WHO; 2002 [cited 2015 Jun 13]. Available from: [http://www.academia.edu/17512602/Imbalances\\_in\\_the\\_health\\_workforce\\_briefing\\_paper](http://www.academia.edu/17512602/Imbalances_in_the_health_workforce_briefing_paper)
316. Alsafi E, Baharoon S, Ahmed A, Al-Jahdali HH, Al Zahrani S, Al Sayyari A. Physicians' knowledge and practice towards medical error reporting: a cross-sectional hospital-based study in Saudi Arabia. *East Mediterr Health J*. 2015 [cited 2017 May 13];21(9):655-664.
317. Woolever DR. The impact of a patient safety program on medical error reporting. In: Henriksen K, Battles J, Marks E, editors. *Advances in patient safety: from research to implementation*. Rockville, (MD: AHRD, US; 2005.
318. Spilsbury K, Rosman R, Alan J, Boyd J, Ferrante AM, Semmens J. Cross border hospital use: analysis using data linkage across four Australian states. *Med J Aust*. 2015 [cited 2017 Apr 2];202(11):582-586.
319. Badiyepymaie Jahromi Z, Parandavar N, Rahmanian S. Investigating factors associated with not reporting medical errors from the medical team's point of view in Jahrom, Iran. *Glob J Health Sci*. 2014 [cited 2017 May 14];6(6):96-104.
320. Liu C, Liu W, Wang Y, Zhang Z, Wang P. Patient safety culture in China: a case study in an outpatient setting in Beijing. *BMJ Qual Saf* 2013 [cited 2016 May 17];18 December:1-9.
321. Ali H, Ibrahim S, Al Mudaf B, Al Fadalah T, Jamal D, El-Jardali F. Baseline assessment of patient safety culture in public hospitals in Kuwait. *BMC Health Serv Res*. 2018 [cited 2018 Apr 3];18:158-160.
322. Al Sweleh F, Al Saedan M, Al Dayel O. Patient safety culture perceptions in the college of dentistry. *Medicine*. 2018 [cited 2018 Apr 26];97(2):e9570.
323. Wang M, Tao H, Fang H, Cheng Z, Cai M, Lin X, et al. Patient safety culture in surgical departments versus other departments in county hospitals of Hubei province, China: a cross-sectional survey. *The Lancet*. 2016 [cited 2017 Jul 22];388.

324. Sepp J, Tint P. The components of non-punitive environment in nursing. *Safety of Technogenic Environment*. 2017 [cited 2017 Dec 3];8(1):24-30.
325. Hsieh SY. Factors hampering the use of patient complaints to improve quality: an exploratory study. *Int J Nurs Pract*. 2009 [cited 2017 Jun 2];15(6):534-542.
326. Janmano P, Chaichanawirote U, Kongkaew C. Analysis of medication consultation networks and reporting medication errors: a mixed methods study. *BMC Health Serv Res*. 2018 [cited 2017 Jun 12];18(3):221-222.
327. Pichert J, Hickson G, Moore I. Using patient complaints to promote patient safety. In: Henriksen K, Battles J, Keyes M, editors. *Advances in patient safety: New directions and alternative approaches*. Rockville, MD: AHRQ, USA; 2008.
328. Gluyas H, Harris SJ. Understanding situation awareness and its importance in patient safety. *Nurs Stand*. 2016 [cited 2018 May 9];30(34):50-60.
329. Cohen NL. Using the ABCs of situational awareness for patient safety. *Nursing2018*. 2013 [cited 2018 May 7];43(4):64-65.
330. Hsu YC, Jerng JS, Chang CW, Chen LC, Hsieh MY, Huang SF, et al. Integrating team resource management program into staff training improves staff's perception and patient safety in organ procurement and transplantation: the experience in a university-affiliated medical center in Taiwan. *BMC Surg*. 2014 [cited 2016 Apr 3];14:51.
331. Saleem AM, Paulus J, Vassiliou M, Parsons SK. Initial assessment of patient handoff in accredited general surgery residency programs in the United States and Canada: a cross-sectional survey. *Can J Surg*. 2015 [cited 2018 May 3];58(4):269-277.
332. Schwappach D, Richard A. Speak up-related climate and its association with healthcare workers' speaking up and withholding voice behaviours: a cross-sectional survey in Switzerland. *BMJ Qual Saf* 2018 [cited 2018 May 3];17:1-9.
333. Souza VS, Kawamoto AM, Oliveira JL, Tonini NS, Fernandes LM, Nicola AL. Errors and adverse events: the interface with health professionals' safety culture. *Cogitare Enferm*. 2015 [cited 2018 May 13];20(30):474-4781.
334. Tweski RA. Medical errors: focusing more on what and why, less on who. *J Oncol Pract*. 2007 [cited 2018 May 11];3(2):66-70.
335. Cady RF. Becoming a high reliability organization—operational advice for hospital leaders. *JONAS Healthc Law Ethics Regul*. 2008 Apr-Jun [cited 2018 May 1];10(2):33.
336. Altmiller G. The role of constructive feedback in patient safety and continuous quality improvement. *Nurs Clin North Am*. 2012 [cited 2015 Feb 21];47(3):365-374.
337. Kalisch BJ, Lee KH. Nurse staffing levels and teamwork: a cross-sectional study of patient care units in acute care hospitals. *J Nurs Scholarsh*. 2011 [cited 2016 Jul 22];43(1):82-88.
338. Al-Awa B, Al Mazrooa A, Rayes O, El Hati T, Devreux I, Al-Noury K, et al. Benchmarking the post-accreditation patient safety culture at King Abdulaziz University Hospital. *Ann Saudi Med*. 2012 Mar-Apr [cited 2015 Jun 5];32(2):143-50.
339. Campione J, Famolaro T. Promising practices for improving hospital patient safety culture. *Jt Comm J Qual Patient Saf*. 2018 [cited 2018 May 7];44(1):23-32.

340. Ginsburg LR, Tregunno D, Norton PG, Mitchell JI, Howley H. 'Not another safety culture survey': using the Canadian patient safety climate survey (Can-PSCS) to measure provider perceptions of PSC across health settings. *BMJ Qual Saf.* 2013 [cited 2017 Jul 3].
341. Al-Khaldi YM. Attitude of primary care physicians toward patient safety in Aseer region, Saudi Arabia. *J Family Community Med.* 2013 Sep-Dec [cited 2016 Mar 13];20(3):153-158.
342. Vlayen A, Hellings J, Claes N, Peleman H, Schrooten W. A nationwide Hospital Survey on Patient Safety Culture in Belgian hospitals: setting priorities at the launch of a 5-year patient safety plan. *BMJ Qual Saf.* 2012 [cited 2014 Jun 9];21(9):760-767.
343. Al-Doweri H, Al-Raoush AT, Alkhatib A, Batiha MA. Patient's safety culture: principles and applications: review article *Eur Sci J.* 2015 [cited 2017 May 22];11(15):83-95.
344. Speroff T, Nwosu S, Greevy R, Weinger MB, Talbot TR, Wall RJ, et al. Organisational culture: variation across hospitals and connection to patient safety climate. *Qual Saf Health Care.* 2010 [cited 2017 May 20];19(6):592-599.
345. Gupta KS, Rokade V. Importance of quality in health care sector: a review. *J Healthc Manag.* 2016 [cited 2018 Jan 1];18(1):84-94.
346. O'Leary DS. Accreditation's role in reducing medical errors. *West J Med.* 2000 [cited 2017 May 7];172(6):357-358.
347. Viswanathan HN, Salmon JW. Accrediting organizations and quality improvement. *Am J Manag Care.* 2000 [cited 2016 Dec 20];6(10):1117-1130.
348. Saufl NM, Fieldus MH. Accreditation: a "voluntary" regulatory requirement. *J Perianesth Nurs.* 2003 [cited 2013 Nov 13];18(3):152-159.
349. Ridelberg M, Roback K, Nilsen P. Facilitators and barriers influencing patient safety in Swedish hospitals: a qualitative study of nurses' perceptions. *BMC Nurs.* 2014 [cited 2018 Apr 2];13:23-25.
350. Brubakk K, Vist GE, Bukholm G, Barach P, Tjomsland O. A systematic review of hospital accreditation: the challenges of measuring complex intervention effects. *BMC Health Serv Res.* 2015 [cited 2017 Apr 10];15:280-281.
351. Ng GK, Leung GK, Johnstone JM, Cowling B. Factors affecting implementation of accreditation programmes and the impact of the accreditation process on quality improvement in hospitals: a SWOT analysis. *Hong Kong Med J.* 2013 [cited 2017 May 12];19(5):434-446.
352. Wolf ZR, Hughes RG. Error reporting and disclosure. In: Hughes R, editor. *Patient safety and quality: an evidence-based handbook for nurses.* Rockville, MD: AHRQ, (US); 2008.
353. Kingston MJ, Evans SM, Smith B, Berry JG. Attitudes of doctors and nurses towards incident reporting: a qualitative analysis. *Med J Aust.* 2004 [cited 2018 Apr 1];181(1):36-39.
354. Unal A, Seren S. Medical error reporting attitudes of healthcare personnel, barriers and solutions: a literature review. *J Nurs Care.* 2016 [cited 2018 May 4];5(6):2-8.

355. Langley GJ, Moen RD, Nolan KM, Nolan TW, Norman CL, Provost LP. *The improvement guide: a practical approach to enhancing organizational performance*. 2nd ed. San Francisco, CA: Wiley; 2009.
356. Cabigao E. *Predictors of intention to quit and satisfaction among nurses who work in nursing homes*. [Cypress, California]: TUI University; 2009 [cited 2016 Jul 10].
357. Bowling A. Mode of questionnaire administration can have serious effects on data quality. *J Public Health*. 2005 [cited 2015 Feb 9];27(3):281-291.
358. Holtgraves T. Social desirability and self-reports: Testing models of socially desirable responding. *Personality and Social Psychology Bulletin*. 2004 [cited 2017 May 2];30(2):161-172.
359. Paulhus DL, Shaver PR, Wrightsman LS. Measurement and control of response bias. In: Robinson JP, Shaver PR, Wrightsman LS, editors. *Measures of personality and social psychological attitudes*. San Diego, CA: Academic Press; 1991.
360. Zikmund WG, Babin BJ, Carr JC, Griffin M. *Business research methods*. 9th ed. Mason, OH. USA: Erin Joyner; 2013.
361. Yeung Raymond YT, Smith Richard D, Ho LM, Johnston Janice M, Leung Gabriel M. Empirical implications of response acquiescence in discrete-choice contingent valuation. *J Health Econ*. 2006 [cited 2015 Apr 13];15(10):1077-1089.
362. Minkov M. Nations with more dialectical selves exhibit lower polarization in life quality judgments and social opinions. *Cross Cult Psychol*. 2009 [cited 2015 Jul 21];43(3):230-250.
363. Smith PB. Acquiescent response bias as an aspect of cultural communication style. *J Cross Cult Psychol*. 2004 [cited 2014 Dec 23];35(1):50-61.
364. Lyons M. Should patients have a role in patient safety? A safety engineering view. *Qual Saf Health Care*. 2007 [cited 2016 May 13];16(2):140-142.
365. Pedersen P. *Multiculturalism as a fourth force*. New York, NY. USA: Taylor & Francis; 2013.



## APPENDICES

### APPENDIX A. HSOPSC QUESTIONNAIRE

#### Hospital Survey on Patient Safety Culture: Items and Dimensions

In this document, the items in the Hospital Survey on Patient Safety Culture are grouped according to the safety culture dimensions they are intended to measure. The item's survey location is shown to the left of each item. Negatively worded items are indicated. Reliability statistics based on the pilot test data from 21 hospitals and more than 1,400 staff are provided for the dimensions.

##### **1. Teamwork Within Units**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- A1. People support one another in this unit.
- A3. When a lot of work needs to be done quickly, we work together as a team to get the work done.
- A4. In this unit, people treat each other with respect.
- A11. When one area in this unit gets really busy, others help out.

Reliability of this dimension—Cronbach's alpha (4 items) = .83

##### **2. Supervisor/Manager Expectations & Actions Promoting Patient Safety<sup>1</sup>**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- B1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.
- B2. My supervisor/manager seriously considers staff suggestions for improving patient safety.
- B3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts. (negatively worded)
- B4. My supervisor/manager overlooks patient safety problems that happen over and over. (negatively worded)

Reliability of this dimension—Cronbach's alpha (4 items) = .75

##### **3. Organizational Learning—Continuous Improvement**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- A6. We are actively doing things to improve patient safety.
- A9. Mistakes have led to positive changes here.
- A13. After we make changes to improve patient safety, we evaluate their effectiveness.

Reliability of this dimension—Cronbach's alpha (3 items) = .76

##### **4. Management Support for Patient Safety**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- F1. Hospital management provides a work climate that promotes patient safety.
- F8. The actions of hospital management show that patient safety is a top priority.
- F9. Hospital management seems interested in patient safety only after an adverse event happens. (negatively worded)

Reliability of this dimension—Cronbach's alpha (3 items) = .83

### **5. Overall Perceptions of Patient Safety**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- A15. Patient safety is never sacrificed to get more work done.
- A18. Our procedures and systems are good at preventing errors from happening.
- A10. It is just by chance that more serious mistakes don't happen around here. (negatively worded)
- A17. We have patient safety problems in this unit. (negatively worded)

Reliability of this dimension--Cronbach's alpha (4 items) = .74

### **6. Feedback & Communication About Error**

(Never, Rarely, Sometimes, Most of the time, Always)

- C1. We are given feedback about changes put into place based on event reports.
- C3. We are informed about errors that happen in this unit.
- C5. In this unit, we discuss ways to prevent errors from happening again.

Reliability of this dimension--Cronbach's alpha (3 items) = .78

### **7. Communication Openness**

(Never, Rarely, Sometimes, Most of the time, Always)

- C2. Staff will freely speak up if they see something that may negatively affect patient care.
- C4. Staff feel free to question the decisions or actions of those with more authority.
- C6. Staff are afraid to ask questions when something does not seem right. (negatively worded)

Reliability of this dimension--Cronbach's alpha (3 items) = .72

### **8. Frequency of Events Reported**

(Never, Rarely, Sometimes, Most of the time, Always)

- D1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?
- D2. When a mistake is made, but has no potential to harm the patient, how often is this reported?
- D3. When a mistake is made that could harm the patient, but does not, how often is this reported?

Reliability of this dimension--Cronbach's alpha (3 items) = .84

### **9. Teamwork Across Units**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- F4. There is good cooperation among hospital units that need to work together.
- F10. Hospital units work well together to provide the best care for patients.
- F2. Hospital units do not coordinate well with each other. (negatively worded)
- F6. It is often unpleasant to work with staff from other hospital units. (negatively worded)

Reliability of this dimension--Cronbach's alpha (4 items) = .80

### **10. Staffing**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- A2. We have enough staff to handle the workload.
- A5. Staff in this unit work longer hours than is best for patient care. (negatively worded)
- A7. We use more agency/temporary staff than is best for patient care. (negatively worded)
- A14. We work in "crisis mode" trying to do too much, too quickly. (negatively worded)

Reliability of this dimension--Cronbach's alpha (4 items) = .63

### **11. Handoffs & Transitions**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- F3. Things "fall between the cracks" when transferring patients from one unit to another. (negatively worded)
- F5. Important patient care information is often lost during shift changes. (negatively worded)
- F7. Problems often occur in the exchange of information across hospital units. (negatively worded)
- F11. Shift changes are problematic for patients in this hospital. (negatively worded)

Reliability of this dimension--Cronbach's alpha (4 items) = .80

### **12. Nonpunitive Response to Errors**

(Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree)

- A8. Staff feel like their mistakes are held against them. (negatively worded)
- A12. When an event is reported, it feels like the person is being written up, not the problem. (negatively worded)
- A16. Staff worry that mistakes they make are kept in their personnel file. (negatively worded)

Reliability of this dimension--Cronbach's alpha (3 items) = .79

### **Patient Safety Grade**

(Excellent, Very Good, Acceptable, Poor, Failing)

- E1. Please give your work area/unit in this hospital an overall grade on patient safety.

### **Number of Events Reported**

(No event reports, 1 to 2 event reports, 3 to 5 event report, 6 to 10 event reports, 11 to 20 event reports, 21 event reports or more)

- G1. In the past 12 months, how many event reports have you filled out and submitted?

**APPENDIX B. LITERATURE REVIEW, ABSTRACTION TABLE**

## Summary of the studies included in the systematic literature review

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
1	Parry, Horowitz & Goldmann  2009  USA	Patient safety attitudes of paediatric trainee physicians	Measure patient safety attitudes of trainee physicians at an academic paediatric hospital	209 trainee physicians	Academic hospital in USA	<ul style="list-style-type: none"> <li>Quantitative</li> <li>Cross-sectional survey using Safety Attitudes</li> <li>Questionnaire (inpatient version)</li> </ul>	<ul style="list-style-type: none"> <li>Descriptive statistics</li> <li>Factor analysis</li> <li>Pearson correlation</li> <li>t-test</li> </ul>	<ul style="list-style-type: none"> <li>Safety attitude positively associated with work condition, job satisfaction, management support</li> <li>Negative relationship between safety attitude and teamwork, communication process, handoffs &amp; feedback following error reporting</li> </ul>
2	Shaw et al.  2009  USA	Paediatric Patient Safety in ED: Unit Characteristics and Staff Perceptions	<ul style="list-style-type: none"> <li>Describe ED characteristics thought to be related to patient safety</li> <li>Measure staff perceptions of safety climate</li> <li>Measure associations between ED</li> </ul>	1,747 ED staff	21 EDs	<ul style="list-style-type: none"> <li>Quantitative</li> <li>A nationally validated survey tool used to collect data</li> </ul>	Descriptive statistics including mean difference, percentage & proportion	<ul style="list-style-type: none"> <li>Doctors had a higher perception of safety than nurses</li> <li>Perception was affected by work experience, work load, long working hours</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
			characteristics and safety climate					
3	Arellino et al. 2010 USA	Structural empowerment and patient safety culture among RN working in adult critical care units	Examine the relationship between structural empowerment & patient safety culture among staff level RN	257 RNs	Tertiary hospital	CWEQ-II & HSOPSC	<ul style="list-style-type: none"> <li>• Correlation test</li> <li>• Descriptive statistics</li> <li>• t-test</li> <li>• Pearson test</li> </ul>	<ul style="list-style-type: none"> <li>• Safety culture significantly correlated with structural empowerment</li> <li>• Relationship between nurse leaders &amp; working environment that affects safety</li> </ul>
4	El-Jaradli, Dimassi, Jamal, Jaafar & Hemaden 2011 Lebanon	Predictors and outcomes of patient safety culture in hospitals	<ul style="list-style-type: none"> <li>• Explore the association between patient safety culture predictors and outcomes, taking into consideration respondent and hospital characteristics</li> <li>• Examine the correlation between patient</li> </ul>	6,807 healthcare providers & managers	68 hospitals	Quantitative cross- sectional study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Cronbach alpha</li> <li>• Bivariate analysis</li> <li>• Person correlation</li> <li>• ANOVA F-test</li> <li>• Student t-test</li> <li>• Multivariate regression analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Significant correlation between all patient safety culture dimensions</li> <li>• Significant correlation between error reporting &amp; hospital &amp; respondent characteristics</li> <li>• Significant correlation between respondent characteristics &amp; safety perception &amp; frequency of events reported</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
			safety culture composites				<ul style="list-style-type: none"> <li>• Generalised Estimating Equations</li> </ul>	
5	Shie et al. 2011 Taiwan	Patient safety attitudes among respiratory therapists in Taiwan	Assess clinician awareness of patient safety	1220 clinicians	Nationwide	Quantitative cross-sectional using Safety Attitude Questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Cronbach alpha</li> <li>• Pearson correlation</li> <li>• One-way variance analysis</li> <li>• Scheffe post hoc</li> </ul>	<ul style="list-style-type: none"> <li>• Clinicians had a low positive attitude about teamwork, safety climate, job satisfaction, stress recognition &amp; management support</li> <li>• Senior clinicians had a lower perception of safety compared to juniors</li> <li>• Clinicians in larger centres had more positive attitudes than those in smaller centres</li> </ul>
6	Ballangrud, Hedelin, Hall-Lord, 2012 Norway	Nurses' perceptions of patient safety climate in intensive care units: A cross-sectional study	Investigate RN perceptions of the patient safety climate & explore potential predictors for overall perception of safety	220 RNs in intensive care units	10 ICUs in 6 hospitals	Quantitative cross-sectional using HSOPSC questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Pearson Chi-square</li> <li>• General linear model (ANOVA)</li> <li>• Leven's test</li> <li>• Tukey post hoc</li> </ul>	<ul style="list-style-type: none"> <li>• Significant difference in perception of safety aptitude based on units and hospitals</li> <li>• 7-unit safety dimensions made significant contribution to safety attitude</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
			and frequency of incident reporting				<ul style="list-style-type: none"> <li>• Sequential multiple regression</li> <li>• Cronbach alpha</li> </ul>	
7	Feng et al. 2012 China	Factors associated with nurses' perceptions of patient safety culture in China: a cross-sectional survey study	Eexplore nurses' perceptions of patient safety culture & factors associated with those perceptions	248 RNs	A university hospital	Quantitative cross-sectional using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Cronbach alpha</li> <li>• Correlation test</li> <li>• Multiple linear regression analyses</li> <li>• Bivariate correlation</li> <li>• Multicollinearity assessment (variance inflation factor)</li> </ul>	<ul style="list-style-type: none"> <li>• 61.3% of respondents had positive safety perception</li> <li>• Teamwork &amp; organisational learning scored the highest positive responses</li> <li>• Two factors negatively affected safety: non-punitive &amp; staffing</li> <li>• Fours factors were associated with safety culture: managers support for safety, safety priority, work experience &amp; management commitment</li> </ul>
8	Garon 2012 USA	Speaking up, being heard: registered nurses perceptions of	Explore nurses' perceptions of their ability to speak up and be heard in the workplace	10 focus groups	6 hospitals	Descriptive qualitative study adopting a semi-structured interview (45–60 min)	Thematic analysis	Findings support the importance role of managers and communication openness in improving patient safety culture



No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
9	Durani, Dias, Singh & Taub 2013 UK	workplace communication Junior doctors and patient safety: Evaluating knowledge, attitudes and perception of safety climate	Evaluate knowledge, attitudes and perceptions of safety climate of junior doctors	527 doctors		Quantitative cross- sectional using online Attitudes and Climate Questionnaire	<ul style="list-style-type: none"> <li>• Descriptive frequencies</li> <li>• Chi-square</li> </ul>	Subtle differences in attitudes to patient safety among junior doctors of different grades and specialities
10	Ginsburg et al. 2013 Canada	'Not another safety culture survey': using the Canadian patient safety climate survey (Can-PSCS) to measure provider perceptions of PSC across health settings	examines the revised Canadian PSCS (Can-PSCS) for use across a range of care settings	13126 health care providers	119 and 35 health settings across Canada	Quantitative cross- sectional using a the Canadian Patient Safety Climate Survey	<ul style="list-style-type: none"> <li>• Confirmatory factor analysis</li> <li>• Exploratory factor analysis</li> <li>• Comparative Fit Index</li> </ul>	<ul style="list-style-type: none"> <li>• Safety perception positively and significantly correlated with error reporting rate</li> <li>• Relationship between management support and patient safety practices</li> <li>• Direct contact with patient was associated with the number of error reporting &amp; open communication</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
11	In-Sook et al. 2013 Korea	Factors affecting the perception of importance and practice of patient safety management among hospital employees in Korea	Identify factors affecting the perception of the importance and practice of patient safety management among hospital employees	280 staff	A hospital	Quantitative cross-sectional using a locally developed questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• <i>t</i>-test</li> <li>• One-way ANOVA</li> <li>• Pearson correlation</li> <li>• Multiple regression</li> </ul>	<ul style="list-style-type: none"> <li>• Factors affecting safety perception: direct contact with patient, working hours &amp; education</li> <li>• Factors affecting practice: work load &amp; perceived adequacy of the patient safety management system</li> </ul>
12	Auer et al. 2014 Switzerland	How hospital leaders contribute to patient safety through the development of trust	Explore the associations between hospital management support for patient safety, registered nurses' trust in hospital management, and their overall perception of patient safety	1,633 RNs	134 medical & surgical units in 35 adult acute care hospitals	Quantitative cross-sectional using HSOPSC & RN4CAST nurse questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Path analysis to detect the direction of relationship</li> <li>• Factor analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Association between management support for safety and overall perception of patient safety</li> <li>• Association observed in communications openness and improving patient safety</li> <li>• Role of management in promoting safety was critical</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
13	Bahrami et al. 2014 Iran	Iranian nurses' perception of patient safety culture	Survey patient safety culture in Iran	340 RNs	2 educational hospitals	Quantitative cross-sectional using HSOPSC (Persian version)	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Cronbach alpha</li> <li>• t-test</li> <li>• ANOVA test</li> </ul>	<ul style="list-style-type: none"> <li>• Both hospitals had low to average safety culture score</li> <li>• Lowest scores were in staffing, non-punitive response to errors &amp; frequency of errors reported</li> <li>• Significant differences between the two hospitals in frequency of events reported, organisational learning &amp; staffing</li> <li>• 29.20% and 28.80% of respondents in each hospital ranked their hospitals as "excellent"</li> </ul>
14	Blignaut, Coetzee & Klopper 2014 South Africa	Nurse qualifications and perceptions of patient safety and quality of care in South Africa	<ul style="list-style-type: none"> <li>• Investigate professional nurses' perceptions of patient safety and quality of care</li> <li>• Determine the relationship between these</li> </ul>	1117 nurses	55 private units & 7 public hospitals	Quantitative cross-sectional using RN4CAST survey	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• t-test</li> </ul>	<ul style="list-style-type: none"> <li>• Significant problem in the perception of safety and quality of care among nurses</li> <li>• Under-reporting rate of errors</li> <li>• Statistical difference for safety perception in different hospitals and qualification levels</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
			perceptions and professional nurses' qualifications					
15	Jia et al. 2014  China	Safety culture in a pharmacy setting using a pharmacy survey on patient safety culture: a cross- sectional study in China	Explore the attitudes and perceptions of patient safety culture for pharmacy workers	527 pharmacists	20 pharmacies in 20 hospitals	Quantitative cross- sectional using Pharmacy Safety Climate Questionnaire	<ul style="list-style-type: none"> <li>• Excel used to analyse demographic data</li> <li>• Chi-square</li> <li>• Factor analysis</li> <li>• Spearman analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Statistical differences in the perception of patient safety culture at different hospitals</li> <li>• Statistical differences in the perception of patient safety culture at different qualification levels</li> </ul>
16	Liu et al. 2014  China	Patient safety culture in China: a case study in an outpatient setting in Beijing	Investigate patient safety culture from the perspective of health workers and patients	318 healthcare providers included in the survey Interviews 27 healthcare providers & 22 patients	Outpatient setting in a hospital	Mixed method study using HSOPSC & in- depth interviews	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Correlation analysis</li> <li>• ANOVA</li> <li>• Multiple regression</li> <li>• Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Respondents perceived a high level of unsafe care</li> <li>• Lack of communication was a significant problem</li> <li>• Fear of blame/penalty was a significant barrier for reporting errors</li> <li>• Lack of management support was an obstacle to build a positive safety culture</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
17	Alenius, Tishelman, Runesdotter & Lindqvist  2014  Sweden	Staffing and resource adequacy strongly related to RNs' assessment of patient safety: a national study of RNs working in acute care hospitals in Sweden	Assess the safety of patient care in nurses workplace & how factors in their work environment related to patient safety	9,236 RNs	79 acute care hospitals	Quantitative study using Practice Environment Scale of Nursing Work Index & HSOPSC	<ul style="list-style-type: none"> <li>• Correlation analysis</li> <li>• Proportional odds regression analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Strong relationship between nurse assessment of patient safety &amp; work environment factors</li> <li>• Nurses who had direct contact with patient had more positive perception of safety culture</li> <li>• No effect between nurse experience &amp; safety perception</li> <li>• Positive perception related to adequate staff levels &amp; resources</li> </ul>
18	Abdi, Delgoshaei, Ravaghi, Abbasi & Heyrani  2015  Iran	The culture of patient safety in an Iranian intensive care unit	Explore nurses' & physicians' attitudes & perceptions relevant to safety culture	<ul style="list-style-type: none"> <li>• 42 in a quantitative study</li> <li>• 20 in a qualitative study</li> </ul>	ICU in a hospital	Mixed method study using Safety Attitude Questionnaire & purposeful interview	<ul style="list-style-type: none"> <li>• <i>t</i>-test</li> <li>• Komogorov-Smirnov test</li> <li>• Framework analysis for qualitative data</li> </ul>	<ul style="list-style-type: none"> <li>• Significant difference in safety attitude between doctors &amp; nurses</li> <li>• Under-reporting rate of errors</li> <li>• Failure to learn from errors</li> <li>• Lack of speak up &amp; communication</li> <li>• Low job satisfaction among ICU Nurses</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
								<ul style="list-style-type: none"> <li>• Ineffective nurse–doctor communication</li> </ul>
19	Ammouri, Tailakh, Muliira, Geethakrishnan, & Al-Kindi 2015 Oman	Patient safety culture among nurses	To investigate nurses' perceptions of patient safety culture & identify factors that need to be emphasised to develop and maintain patient safety culture	414 RNs	4 public hospitals	Quantitative cross-sectional using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• General linear regression</li> </ul>	<ul style="list-style-type: none"> <li>• Positive perception of safety culture was statistically associated with manager support for safety, feedback about errors, communication openness, teamwork &amp; handoffs, and transition of patients</li> <li>• Years of experience &amp; organisational learning were significant factors that improved the perceived safety culture</li> </ul>
20	Chakravarty, Sahu, Biswas, Chatterjee & Rath 2015 India	An assessment of patient safety climate in tertiary care hospitals	Explore patient safety climate in three large multi-speciality tertiary care hospitals	300 healthcare providers	3 large tertiary hospitals	Quantitative using Safety Attitude Questionnaire	<ul style="list-style-type: none"> <li>• ANOVA test</li> <li>• Multiple regression</li> <li>• Co-relation analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Significant differences among staff for teamwork, perception of management and stress recognition</li> <li>• Teamwork &amp; management perception had significant</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
21	Khater. W, Akhu-Zaheya, Al-Mahasneh & Khater. R  2015  Jordan	Nurses' perceptions of patient safety culture in Jordanian hospitals	Assess patient safety culture from nurses' perspective	658 RNs	1 hospital	A quantitative, descriptive, comparative, cross- sectional design using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Multivariate analysis</li> <li>• Linear regression</li> </ul>	<p>correlation with patient safety index score</p> <ul style="list-style-type: none"> <li>• Teamwork had the only positive response</li> <li>• Areas that need improvement: communication openness, staffing, handoffs &amp; transition, non-punitive response to errors &amp; teamwork across units</li> <li>• Age, years of experience &amp; hospital characteristics were significant factors that influenced nurses' perception of patient safety culture</li> </ul>
22	Lambrou, Papastavrou, Merkouris & Middleton  2015  Cyprus	Professional environment and patient safety in emergency departments	Examine nurses' & physicians' perceptions of professional environment and its association with patient safety	224 doctors & nurses	Public emergency department	Quantitative study using the Revised Professional Practice Environment Scale & the Safety Climate Domain of the Emergency Medical Services Safety	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Cronbach alpha</li> <li>• One-way ANOVA</li> <li>• t-test</li> </ul>	<ul style="list-style-type: none"> <li>• Significant difference between nurses' &amp; doctors' safety perception in terms of: staff relationship, motivation &amp; cultural sensitivity</li> <li>• Association between leadership and patient safety culture</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
						Attitude Questionnaire	<ul style="list-style-type: none"> <li>• Bivariate association analysis</li> <li>• Linear regression</li> <li>• Multiple regression</li> <li>• Logistic regression</li> </ul>	
23	Luiz, Simoes, Barichello & Barbosa 2015 Brazil	Factors associated with the patient safety climate at a teaching hospital	Investigate the association between the scores of the patient safety climate and socio-demographic and professional variables	556 healthcare providers	1 large public hospital	A quantitative, observational, sectional study using Safety Attitude Questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Multiple linear regression</li> <li>• t-test</li> <li>• ANOVA test</li> </ul>	<ul style="list-style-type: none"> <li>• Statistically significant association between safety perception and professional activity, professional category, length of professional activity, and work experience</li> <li>• Perception on managers (at unit or hospital level) was a significant predictive variable for positive safety attitude</li> </ul>
24	Saleh, Darawad, Al-Hussami	The perception of hospital safety culture and selected	<ul style="list-style-type: none"> <li>• Eexplore RN perceptions of safety culture</li> </ul>	242 nurses	1 hospital	Quantitative: descriptive correlational design using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Cronbach alpha</li> </ul>	<ul style="list-style-type: none"> <li>• Teamwork within units was the highest positive perception of safety culture, whereas staffing &amp;</li> </ul>



No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
2015	Jordan	outcomes among nurses: An exploratory study	<ul style="list-style-type: none"> <li>Identify important safety culture dimensions that may be related to safety outcomes</li> </ul>				<ul style="list-style-type: none"> <li>Pearson correlation</li> </ul>	<ul style="list-style-type: none"> <li>non-punitive response to errors were the lowest</li> <li>Significant correlation between safety subscale and the safety outcome variable (number of events reported in 12 months &amp; safety grade)</li> <li>Positive correlation between management support for safety &amp; communication openness</li> <li>Positive significant correlation between frequency of events reported &amp; non-punitive response to error, hospital management support for safety, feedback about error, communication openness &amp; organisational learning</li> </ul>
25	Top, Tekingunduz 2015	Patient Safety Culture in a Turkish Public Hospital: A Study of Nurses'	Investigate nurses' perceptions about the culture of patient safety	200 nurses	1 public hospital	Quantitative study using HSOSPC	<ul style="list-style-type: none"> <li>Microsoft Excel</li> <li>Descriptive statistics</li> </ul>	Significant predictors of safety perception included organisational learning, communication openness, teamwork within unit, staffing, frequency of events reported,

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
	Turkey	Perceptions About Patient Safety					<ul style="list-style-type: none"> <li>• Multivariate regression analysis</li> </ul>	patient safety grade, management support for safety, & feedback about errors
26	Labat & Sharma  2016  Congo	Qualitative study exploring surgical team members' perception of patient safety in conflict-ridden Eastern Democratic Republic of Congo	Identify potential barriers to patient safety	In-depth interviews with 16 healthcare professiona ls	Teaching hospital	Qualitative study design	Qualitative content analysis	<ul style="list-style-type: none"> <li>• Economic issues affected patient safety in health system</li> <li>• Blame culture affected the perception of safety accompanied by perceived inefficient support services &amp; low salaries</li> <li>• Increased corruption within health organisations, population impoverishment &amp; substance abuse among health staff adversely affected safe care</li> <li>• Staff reported resilience &amp; resourcefulness to address safety had worsen safety issues</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
27	Sivanandy, Maharajan, Rajiah, Wei, Loon & Yee 2016 Malaysia	Evaluation of patient safety culture among Malaysian retail pharmacists: results of a self- reported survey	<ul style="list-style-type: none"> <li>Explore the attitude and perception of retail pharmacists towards patient safety</li> <li>Identify the strengths and areas for patient safety improvement</li> </ul>	390 pharmacists from 3 states in Malaysia	3 hospitals	Quantitative, cross-sectional study using HSOPSC	<ul style="list-style-type: none"> <li>Descriptive statistics</li> <li>Chi-square test</li> </ul>	<ul style="list-style-type: none"> <li>Positive responses ranged from 31.2–87.4%</li> <li>Low level of staff &amp; long working hours negatively affected safety culture</li> <li>Response to errors &amp; overall perception of safety scored low positive response rates</li> </ul>
28	Wami, Demssie, Wassie & Ahmed 2016 Ethiopia	Patient safety culture and associated factors: A quantitative and qualitative study of healthcare workers' view in Jimma zone hospitals,	Assess the level of patient safety culture and associated factors	<ul style="list-style-type: none"> <li>Quantitative data: 596 healthcare staff</li> <li>Qualitative data: 10 interviewed with healthcare staff</li> </ul>	4 hospitals	<ul style="list-style-type: none"> <li>Quantitative data collected via HSOPSC questionnaire</li> <li>Qualitative data collected via one-to-one in-depth interviews using semi-structured guide</li> </ul>	<ul style="list-style-type: none"> <li>Descriptive statistics</li> <li>Bivariate analysis</li> <li>Multivariate linear regression analysis</li> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Overall level of safety culture was 46.7%</li> <li>Factors significantly associated with the low safety culture included working hours, teamwork within hospitals, good communication, feedback about errors, level of staff, teamwork &amp; education programs</li> <li>Openness to report errors, resources, staff attitude &amp; direct</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
		Southwest Ethiopia						contact with patients were important factors that influenced safety culture
29	Elsous, Sari, Aljeesh &Radwan  2016  Palestine	Nursing perceptions of patient safety climate in the Gaza Strip, Palestine	<ul style="list-style-type: none"> <li>Assess the perception of nurses about patient safety culture</li> <li>Test their perception whether it is significantly affected by the nurses' position, age, experience and working hours</li> </ul>	210 RNs	4 public hospitals	Quantitative, descriptive cross-sectional study using the Safety Attitude Questionnaire	<ul style="list-style-type: none"> <li>Descriptive statistics</li> <li>Chi-square test</li> <li>One-way ANOVA</li> <li>Generalised estimation equation</li> </ul>	<ul style="list-style-type: none"> <li>Job satisfaction was the most highly perceived factor affecting safety</li> <li>Significant difference in safety perception between managers &amp; clinicians</li> <li>Relationship between work experience and better safety perception</li> <li>Nurses aged &gt;35 years who worked ≤35 hours/week had better safety attitude</li> <li>Nurses with positive safety attitude collaborated better with other staff</li> </ul>
30	Ban & Chung  2017	Gender-based differences in surgical	To examine gender differences in surgical resident	A proportions of male and	US hospitals	A quantitative descriptive study with a cross-sectional	<ul style="list-style-type: none"> <li>Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>Females were more likely than males to be dissatisfied with patient safety</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
	China	residents' perceptions of patient safety, continuity of care, and well-being: an analysis from the Flexibility in Duty Hour Requirements for Surgical Trainees (FIRST) trial	perceptions of patient safety, education, health and well-being, and job satisfaction, and assessed whether duty hour policies affected gender differences	female health care providers			<ul style="list-style-type: none"> <li>• Logistic regression</li> </ul>	<ul style="list-style-type: none"> <li>• Female were more likely than male to perceive a negative effect of duty hours on patient's outcome</li> <li>• factor in under-reporting errors</li> </ul>
31	Martinez et al. 2017 USA	Speaking up about traditional and professionalism-related patient safety threats: a national survey of	Compare interns' and residents' experiences, attitudes & factors associated with speaking up about traditional versus professionalism-	1800 medical & surgical interns & residents	6 large academic medical centres from different geographic regions in USA	Quantitative cross-sectional survey using Safety Attitude Questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Multivariate logistic regression</li> <li>• McNemar test</li> </ul>	<ul style="list-style-type: none"> <li>• More than 50% of respondents found it difficult to speak up in their clinical area about unprofessional behaviour</li> <li>• Perceived barriers for speaking openly were trouble, fear of conflict or eliciting anger from team member</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
		interns and residents	related safety threats					<ul style="list-style-type: none"> <li>• Fewer respondents expressed their likelihood to speak up when it came to patient safety</li> </ul>
32	Farzi et al. 2017	Patient safety culture in intensive care units from the perspective of nurses: A cross-sectional study	Examine patient safety from nurses' perspective	367 nurses	ICU nurses in a teaching hospital in Isfahan, Iran	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Two areas of strength identified (teamwork within units and organisational learning)</li> <li>• Five areas of patient safety considered areas for improvement: staffing, non-punitive response to errors, handoffs &amp; transitions, communication openness and teamwork across units</li> </ul>
33	Rizvi et al. 2017	Assessing patient safety culture and ward error reporting in public sector hospitals of Pakistan	Evaluate nurses perception of patient safety culture	309 nurse practitioners	Two public hospitals in Pakistan	Cross-sectional quantitative study using HSOPSC questionnaire to collect data	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Low error reporting observed in both hospitals</li> <li>• Nurses blamed for errors which affected their reporting intentions</li> <li>• Lack of communication openness</li> <li>• Lack of processes for patient handoffs and transitions</li> <li>• Low staffing level affect AEs reporting rate</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
34	El-Gendi et al. 2017	Assessment of patient safety culture among Egyptian healthcare employees	A baseline assessment of safety culture among healthcare staff	250 clinicians	Two hospitals in Egypt	Cross-sectional quantitative study using safety climate questionnaire	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• <i>t</i>-test and one ANOVA</li> <li>• Correlation analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Good teamwork within units</li> <li>• Overall positive perception of patient safety climate dimensions</li> <li>• Negative perception of stress recognition</li> </ul>
35	Wagner et al. 2017	Nursing home patient safety culture perceptions among US and immigrant Nurses	Assess the culture of patient safety in maternity units	299 healthcare worker	Maternity units in seven hospitals in Iran	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Low error reporting rate</li> <li>• Teamwork within units was area of strength</li> <li>• Lowest perceived dimension was staffing levels</li> </ul>
36	Elsheikh et al. 2017	Assessment of patient safety culture: a comparative case study between physicians and nurses	Compare responses of physicians and nurses to patient safety culture assessment	623 nurses and doctors	Security Force Hospital Program Makkah, in Saudi Arabia	HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Low perception in staffing, non-punitive response to errors</li> <li>• High perception of teamwork within units</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
37	Tereanu et al. 2017	Exploring patient safety culture in preventive medicine settings: an experience from Northern Italy	Explore patient safety culture in public local health settings	479 clinicians	Public health staff working in Italian Local Health Authorities	Cross-sectional quantitative study using Italian HSOPSC	<ul style="list-style-type: none"> <li>• STATA was used to run the descriptive analysis</li> </ul>	<ul style="list-style-type: none"> <li>• High perception in teamwork within units</li> <li>• Low perception in staffing, non-punitive response to errors, handoffs &amp; transition, teamwork across units, communication about errors, and management support for patient safety</li> </ul>
38	Brandis et al. 2017	Bricks-and-mortar and patient safety culture	Investigate the impact of bricks-and-mortar on patient safety culture before and two years after the move of a large tertiary hospital to a greenfield site	306 in 2013 and 246 in 2015	A large Australian healthcare service	Data collected from the same workforce across two time periods	<ul style="list-style-type: none"> <li>• Descriptive analysis</li> <li>• Inferential statistics</li> <li>• 2-way analysis of variance</li> </ul>	<ul style="list-style-type: none"> <li>• Perceived patient safety culture remains unchanged for staff</li> <li>• Different perceptions of patient safety culture between staff groups remains the same</li> </ul>



No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
39	Smith et al.  2017	Exploring relationships between hospital patient safety culture and consumer reports safety scores	Examine whether patient safety culture perceptions of U.S. hospital staff in a large national survey are related to publicly reported patient safety ratings of hospitals	140,316 in 164 hospitals	164 hospitals in US	Data analysis from dataset	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Multiple multivariate linear regressions</li> </ul>	<ul style="list-style-type: none"> <li>• Higher perception of safety culture significantly associated with higher overall consumer reports</li> <li>• Higher perception of communication about medication and discharge</li> </ul>
40	Zhao et al.  2017	Survey and analysis of patient safety culture in a country hospital	Survey patient safety culture in a country hospital and provide evidence of strategies to improve patient safety culture	661 clinicians	One Chinese country hospital	Cross-sectional qualitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Multiple linear regression analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Teamwork within units was the only area considered an area of strength</li> <li>• Non-punitive response to errors, staffing, communication openness, overall perception of patient safety and frequency of events reported were areas for improvement</li> <li>• AE reporting affected by staff position and years of experience in same hospital</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
41	Ghahramanin et al.  2017	Quality of healthcare services and its relationship with patient safety culture and nurse-physician professional communication	Investigate the quality of healthcare services from patients' perspectives and its relationship with patient safety culture	101 nurses	One public hospital in Tabriz, Iran	A cross-sectional quantitative study using SERVQUAL	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• SPSS was used to run correlation analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Organisational learning was a strong area in patient safety culture</li> <li>• Non-punitive response to errors, staffing, teamwork across units and communication were areas for improvement</li> </ul>
42	Leonard & O'Donovan  2017	Measuring safety culture: Application of the Hospital Survey on Patient Safety Culture to radiation therapy departments worldwide	Assess the current status of safety culture, identify areas for improvement and areas that excel, examine factors that influence safety culture, and raise staff awareness	266 clinicians	One teaching hospital in Dublin, Ireland	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Teamwork within units had the highest composite score</li> <li>• Handoffs &amp; transition had the lowest composite score followed by teamwork across units and staffing</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
43	El-Shabrawy et al. 2017	Assessment of patient safety culture among healthcare workers in Beni- Suef University Hospital, Egypt	Assess the perceptions of patient safety culture attitude among healthcare workers	423 staff	Beni-Suef University Hospital	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Only two areas of patient safety culture were &gt;50%; teamwork within units &amp; organisational learning</li> <li>• Lowest areas in patient safety culture were frequency of events reported, non-punitive response to error, teamwork and staffing</li> </ul>
44	Al Sweleh et al. 2017	Patient safety culture perception in the college of dentistry	Assess staff and student perceptions of patient safety culture	390 medical students	College of Dentistry at King Saud University, Saudi Arabia	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Three areas of patient safety culture were high: teamwork within units, organisational learning, and management support for patient safety</li> <li>• Low composite scores were seen in staffing, handoffs &amp; transition, non-punitive response to errors, teamwork across units, communication openness, overall perception of patient safety and feedback about errors</li> </ul>

No.	Authors, year, country	Title	Aim(s)	Sample	Setting	Study design & data collection method	Data analysis	Findings
45	Al Lawati et al. 2017	Assessment of patient safety culture in primary healthcare in Muscat, Oman	Assess patient safety culture among clinicians in primary healthcare	217 clinicians	Primary healthcare in Muscat, Oman	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• Descriptive statistics</li> <li>• Regression analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Teamwork within units and organisational learning were strong areas in the culture of patient safety</li> <li>• Staffing, communication openness, non-punitive response to errors, feedback about errors were areas for improvement</li> </ul>
46	Ali et al. 2017	Baseline assessment of patient safety culture in public hospitals in Kuwait	Examine the association between predictors and outcomes of patient safety culture	12,092 clinicians	16 public hospitals in Kuwait	Cross-sectional quantitative study using HSOPSC	<ul style="list-style-type: none"> <li>• SPSS was used to run ANOVA f-test</li> <li>• Regression analysis</li> <li>• GEE</li> <li>• Linear regression</li> </ul>	<ul style="list-style-type: none"> <li>• Regression findings showed association between patient safety outcomes and composites</li> <li>• Areas of strength included teamwork within units, organisational learning, management support for safety, and feedback &amp; communication about errors</li> </ul>

## APPENDIX C. RESEARCH APPROVAL FROM THE UNIVERSITY OF WESTERN AUSTRALIA



THE UNIVERSITY OF  
**WESTERN  
AUSTRALIA**

## Human Ethics

## Office of Research Enterprise

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Our Ref: RA/4/1/6245

04 July 2018

Professor David Preen  
School of Population and Global Health  
MBDP: M431

Dear Professor Preen

**HUMAN RESEARCH ETHICS OFFICE – ETHICS APPROVAL RENEWED**

***Measuring Culture of Patient Safety - A Mixed Method Study of the Healthcare System in the Asir Region of Saudi Arabia***

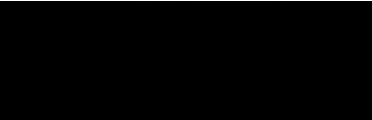
Thank you for submitting your Progress Report for the above project. The report is satisfactory and ethics approval for the project has been renewed.

You will receive a request for your next progress report approximately one month before the next renewal date of 03 July 2019.

If you have any queries, please contact the Human Ethics office at [humanethics@uwa.edu.au](mailto:humanethics@uwa.edu.au).

Please ensure that you quote the file reference – RA/4/1/6245 – and the associated project title in all future correspondence.

Yours sincerely

  
Mark Davies  
Manager, Human Ethics

<b>Name</b>	<b>Faculty / School</b>	<b>Role</b>
Professor David Preen	School of Population and Global Health	Chief Investigator
Dr David Stanley	School of Population and Global Health	Co-Investigator

**Student(s):** Yousef Zahrani - PhD - 21086865



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Our Ref: RA/4/1/6245

07 August 2015

Professor David Preen  
School of Population Health  
MBDP: M431

Dear Professor Preen

**HUMAN RESEARCH ETHICS OFFICE – ETHICS APPROVAL RENEWED**

*Measuring Culture of Patient Safety - A Mixed Method Study of the Healthcare System in the Asir Region of Saudi Arabia*

*Student(s): Yousef Ibrahim Zahrani*

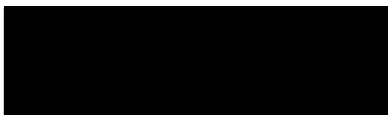
Thank you for submitting your Progress Report for the above project. The report is satisfactory and ethics approval for the project has been renewed.

You will receive a request for your next progress report approximately one month before the next renewal date of 01 September 2016.

If you have any queries, please contact the Human Ethics office at [humanethics@uwa.edu.au](mailto:humanethics@uwa.edu.au).

Please ensure that you quote the file reference – RA/4/1/6245 – and the associated project title in all future correspondence.


Yours sincerely



Dr Caixia Li  
Manager, Human Ethics

## APPENDIX D. RESEARCH APPROVALS FROM THE SAUDI HEALTH DEPARTMENT

2013/1000 : الرقم  
 14/7/2013 : التاريخ  
 NONE : المشفوعات  
 Permission : الموضوع

  
 وزارة الصحة  
 Ministry of Health

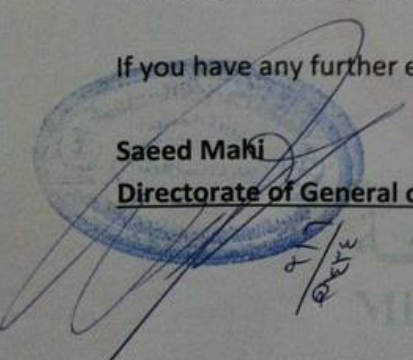
المملكة العربية السعودية  
 وزارة الصحة  
 المديرية العامة للشئون الصحية بمنطقة عسير  
 ٦٠٠ / ٢٧٥

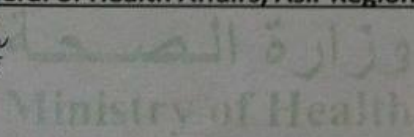
July 14, 2013  
 To who it may concern  
 RE: Yousef Zahrani  
 Sub: Permission to use premises

This is to certify that Mr. **Yousef Zahrani**, a PhD student of University of Western Australia, is completely authorized and supported to conduct a study on the Culture of patient Safety in Public Hospitals in Asir Region. The directorate General of Health Affairs in Asir is the administrative authority of public hospitals in the whole region.

This document is issued upon the request of Zahrani to confirm our agreement, collaboration and support for this study.

If you have any further enquiries please do not hesitate to contact us.

  
 Saeed Maki  
 Directorate of General of Health Affairs, Asir Region

  
 وزارة الصحة  
 Ministry of Health

Kingdom of Saudi Arabia  
Ministry of Health  
Directorate of Health affairs - Assir Region  
600 / 275



المملكة العربية السعودية  
وزارة الصحة  
المديرية العامة للشئون الصحية بمنطقة عسير  
٦٠٠ / ٢٧٥

الرقم : التاريخ : الموضوع : المشفوعات :

مشهد

الاسم	يوسف إبراهيم راشد زهراني
السجل المدني	١٠٠٩٧٧٥٧٤١
الوظيفة	أخصائي أول

إلى من يهمة الأمر :

تشهد المديرية العامة للشئون الصحية بمنطقة عسير بأن الموضح بياناته أعلاه و الذي يدرس الدكتوراه بجامعة غرب استراليا قد جمع بيانات من خمسة عشر مستشفى بمنطقة عسير عن طريق توزيع استبيانات تتعلق بسلامة المرضى في المستشفيات الحكومية و ذلك خلال الفترة من ٢٠١٣/١١/١ إلى ٢٠١٤/٤/١ و بناءً على طلبه أعطي هذا المشهد لتقديمه لمن يهمة الأمر و الله ولي التوفيق،،،

مدير عام الشئون الصحية بمنطقة عسير  
الدكتور/ إبراهيم بن سليمان الحفظي

الختم الرسمي





المملكة العربية السعودية  
وزارة الصحة  
المديرية العامة للشئون الصحية بمنطقة عسير  
إدارة الميزانية  
٦٠٠/٢٧٥

الرقم: ٥٠ / ٤٥ / ٦٤٧٦  
التاريخ: ٢٣ / ٩ / ١٤٣٤  
المشروعات: .....  
الموضوع: .....

المحترم

سعادة مدير مستشفى النماح

السلام عليكم ورحمة الله وبركاته

نفيدكم بأن طالب الدكتوراة / يوسف أبراهيم الزهراني سيقوم بتطبيق بحثه (سلامة المرضى في المستشفيات الحكومية بمنطقة عسير) ضمن متطلبات حصوله على الدرجة العلمية.

نأمل التكرم بتسهيل مهمته وتذليل الصعوبات التي قد تواجهه.

ولكم أطيب تحياتي وتقديري ،،،

مساعد المدير العام للتخطيط والتطوير  
الدكتور/محمد بن حسين محيا

وزارة الصحة  
Ministry of Health

## APPENDIX E. PARTICIPANT INFORMATION LETTER

## The Culture of Patient safety in Public Hospitals in Asir Region of Saudi Arabia



THE UNIVERSITY OF  
WESTERN AUSTRALIA  
*Achieving International Excellence*

With the affiliation of

**Research Aim:**

The overall aim of this PhD project is to measure the culture of patient safety in the public hospitals in Asir region of the Saudi Arabia from the perspective of health care providers and managers.

**هدف الدراسة:**

يهدف هذا المشروع البحثي إلى تقييم ثقافة سلامة المرضى في المستشفيات الحكومية بمنطقة عسير في المملكة العربية السعودية من وجهة نظر الممارسين الصحيين و الإداريين.

**Approvals:**

This project is approved by the University of Western Australia with the reference number: RA/4/1/6245

This project also is approved by the General Directorate of Health Affairs in Asir and King Khalid University.

**الموافقة:**

تمت الموافقة على إجراء هذا البحث من قبل هيئة أخلاقيات البحث العلمي بجامعة غرب استراليا رقم (RA/4/1/6245) كما تمت موافقة المديرية العامة للشؤون الصحية بمنطقة عسير عليه. يدعم هذا البحث جامعة الملك خالد.

An "event" is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.

يتم تعريف " الحدث أو الواقعة " بأنها أي نوع من أنواع الأخطاء الطبية أو الخلل في العمل مما قد ينتج عنها ضرر بالمريض و قد لا ينتج عنها أي ضرر.

**Dear participant,**

My name is Yousef Zahrani and I am currently completing a research study for my PhD degree at the University of Western Australia. The purpose of this research is to explore patient safety culture in public hospitals in Asir Region of Saudi Arabia.

**Before your participation, I would like to confirm that:**

- The University of Western Australia and the Ministry of Health have given their permission for this research to be carried out
- Your involvement in this research is entirely voluntary
- You have the right to withdraw at any stage without it affecting you in any way
- By your participation, I assume that you have agreed to participate and will allow me to use the information you provide unless you decide to withdraw, or to withhold any information

**Privacy**

The information you will provide will be anonymous. Identifying information such as your personal details will not be asked or required. The information will be kept in a locked cabinet for five years, at which time it will be shredded. If you would like any further, please do not hesitate to contact me on my mobile 0505749575 or by email: [yzahrani@hotmail.com](mailto:yzahrani@hotmail.com) You may also contact my supervisor Dr. David Stanley by email: [david.stanley@uwa.edu.au](mailto:david.stanley@uwa.edu.au)

**عزيزي المشارك في البحث**

اشكر لكم للمشاركة في هذا البحث و الذي يهدف إلى تقييم سلامة المرضى بالمستشفيات الحكومية بمنطقة عسير في المملكة العربية السعودية. و قبل مشاركتكم في البحث أود أن أوضح لكم التالي

- تم الموافقة على هذا البحث من قبل جامعة غرب استراليا و المديرية العامة للشئون الصحية بمنطقة عسير و جامعة الملك خالد
- لك مطلق الحرية في المشاركة في هذا البحث دون أي شروط أو قيد من قبل الباحث
- تمتلك حق الانسحاب من البحث في الوقت الذي تريد بدون أذى مسئولية كما لك الحق أيضا في حجب المعلومات التي قدمتها
- مشاركتك في البحث تعتبر موافقة منك في استخدام المعلومات التي قدمتها لأغراض البحث

**الخصوصية**

يضمن لك الباحث الخصوصية الكاملة و لن يتم السؤال عن أي معلومات قد تؤدي إلى معرفة مشاركتكم في البحث و سيتم حفظ معلومات البحث لمدة خمس سنوات بجامعة غرب استراليا ثم يتم التخلص منها بطرق تضمن خصوصية المشاركين. و يمكنكم التواصل مع الباحث أو فريق البحث عن طريق البريد الإلكتروني: [y.zahrani@hotmail.com](mailto:y.zahrani@hotmail.com)

أو الاتصال على جوال رقم: 0505749586 كما يمكنك التواصل مع المشرف على البحث Dr David Stanley عن طريق البريد الإلكتروني: [david.stanley@uwa.edu.au](mailto:david.stanley@uwa.edu.au)

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**APPENDIX F. DATA TOOL USE & TRANSLATION PERMISSION**

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**From:** Safety Culture Surveys [mailto:SafetyCultureSurveys@westat.com]

**Sent:** Tuesday, 22 September 2015 9:51 PM

**To:** Yousef Zahrani

**Cc:** Safety Culture Surveys ; Theresa Famolaro

**Subject:** RE: Data Entry & Analysis Tool Request

Dear Yousef,

Thank you for the information. We in the Patient Safety Culture Surveys Support Group at Westat ([SafetyCultureSurveys@westat.com](mailto:SafetyCultureSurveys@westat.com)) have been authorized to respond on behalf of the Agency for Healthcare Research and Quality by Ms. [Randie Siegel](#), Associate Director, Office of Communications and Knowledge Transfer, Publishing and Electronic Dissemination. Our group, as the Safety Culture Surveys support contractor, handles the majority of permissions for these tools and their related documents in English, permissions to translate these documents, and maintains an electronic community for International users.

Based on your description of your project, AHRQ grants you permission to use the Hospital Survey on Patient Safety Culture in English, or translated into Arabic, for your research at fifteen hospitals in the Asir Region of Saudi Arabia. AHRQ requests that you note on the survey forms that the form is "reprinted/translated with permission from the Agency for Healthcare Research and Quality (an Agency of the United States Department of Health and Human Services); Rockville, Maryland USA." In any publication of the results of the survey, such as a thesis, internal report to the hospital, or professional journal article, please include a proper source citation.

The AHRQ Web site for the patient safety culture surveys is <http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/index.html>. The survey form and related materials can be found at this site. Be sure to read the *Survey User's Guide* for the appropriate survey, especially the sections on modifying or translating the survey. For technical questions, please contact us. We can also put you in touch with other non-U.S. users of the survey (go to "[International Users of the Surveys on Patient Safety Culture](#)" for more information).

If you have questions about permissions issues, or if you are interested in permissions to use or translate other AHRQ tools or documents, please feel free to contact Ms. Siegel or [David Lewin](#), Manager of Copyrights & Permissions, Office of Communications and Knowledge Transfer.

Sincerely,

**Jess Blackwood**

Westat

[SafetyCultureSurveys@westat.com](mailto:SafetyCultureSurveys@westat.com)

1-888-324-9749