

School of Public Health

**Clinicians' Attitudes Toward Patient Safety: A Sequential
Explanatory Mixed Methods Study in Saudi Armed Forces
Hospitals (Eastern Region)**

Ahmed Saad Alzahrani

**This thesis is presented for the Degree of
Doctor of Philosophy
of
Curtin University**

July 2015

Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signed:  _____

Date: 15/07/2015

Acknowledgements

First and foremost I would like to thank Allah for giving me this opportunity to complete my higher education.

I would like to express my deepest appreciation to my principal supervisor, Associate Professor Suzanne Robison, who provided me with academic and personal support during this journey. Without her guidance and support it would not have been possible to complete this thesis. I would also like to thank my thesis committee members, Dr Janis Jansz, Professor Bruce Maycock and Associate Professor Janice Lewis for their kind efforts and their feedback. My appreciation goes to Professor Satvinder Dhaliwal for his assistance and feedback on the quantitative data analysis in phase one of this study.

I would like to thank the Medical Services Department of the Saudi Armed Forces, who sponsored me to complete my graduate studies. A very special thanks to all staff in the study sites who participated in this study. Without their participation, I would not have finished this work.

I would like to thank my parents, who have always supported and encouraged me to pursue a higher qualification. My thanks also go to my brothers and sisters for their support and encouragement.

I would like to thank my little sweet family, especially my wife, Aeshah, for her love and support. She was always available, supporting me and standing beside me at all times. My special thanks to my lovely children, Lina and Albara, for their patience and understanding that I needed to spend most of the time studying far away from them.

Dedication

This thesis is dedicated

To my father and mother

To my wife Aeshah, and my lovely two kids Lina and Albara.

May god bless and protect them all.

Abstract

Background

Health care organisations are responsible for providing safe, high quality care to patients, yet over the last two decades evidence has indicated that thousands of patients have experienced some sort of adverse event when they have been treated in hospitals. As health care workers are key elements in providing safe and high quality of care, assessing their attitudes toward patient safety has been recommended as an approach to enhance the culture of safety in hospitals and consequently the safety of patients.

This study explores physicians' and nurses' attitudes toward patient safety to better understand these attitudes. It is conducted with the intent of informing health policy makers in the Medical Services Department of the Saudi Armed Forces so they may formulate more effective strategies to improve patient safety.

Method

A sequential explanatory mixed methods design was chosen for this study, with data collected in two phases. Quantitative data was collected in phase one, followed by qualitative data in phase two. Collecting both quantitative and qualitative data provided more insight into physicians' and nurses' attitudes, and helped in identifying factors that might influence their attitudes.

In the first phase, quantitative data were gathered using the Safety Attitudes Questionnaire (SAQ). The SAQ evaluates health care workers' attitudes toward six patient safety-related domains: teamwork climate, safety climate, perception of management, job satisfaction, working conditions and stress recognition. The quantitative sample comprised the physicians and nurses working at the study sites, a total of 1,324 physicians and nurses in three Armed Forces hospitals. Of these, 640 physicians and nurses completed the survey. The quantitative data were analysed with the help of SPSS software. Descriptive and statistical analyses, including frequency distributions, mean scores and standard deviations were performed. The number of participants with positive attitudes to the six patient safety domains was calculated. The Chi-square test and, when this was inadequate, Fisher's Exact test were used to compare physicians' and nurses' attitudes toward the six safety domains.

In the second phase, qualitative data were gathered using semi-structured interviews with 20 participants, purposively selected based on the inferences that emerged in phase one. Thematic analysis was adopted to analyse the data with the help of QSR NVivo 8 software.

Results

With the exception of two domains, job satisfaction and teamwork climate, the findings from the SAQ revealed that less than half the physicians and nurses had favourable attitudes toward the patient safety domains, and in particular toward stress recognition and perceptions of management. The results of the quantitative phase also revealed that there were significant differences in physicians' and nurses' attitudes toward patient safety, with the exception of the job satisfaction domain. Nurses had more positive attitudes toward teamwork climate, safety climate, management and working conditions than physicians, while physicians perceived the stress recognition domain more positively than nurses. The results also indicated that nurses' attitudes toward patient safety domains were affected, to some degree, by their demographic characteristics such as nationality, level of education, area of work, work experience and specialty experience. In comparison, physicians' attitudes were affected by job category, area of work and nationality. Findings from the qualitative phase provided more insight into physicians' and nurses' attitudes toward patient safety and why differences existed in their attitudes. These findings suggested that a number of factors were influential, and that these could be classified into five key themes: workforce characteristics, management practices, professional culture, patient safety practices and work environment.

Conclusion

This study provides the most comprehensive information available regarding the attitudes of physicians and nurses toward patient safety in Saudi Armed Forces hospitals. This study confirms previous studies showing that physicians and nurses have discrepant attitudes to patient safety. With exception of job satisfaction and teamwork climate, most physicians and nurses involved in this study demonstrated unfavourable attitudes toward patient safety domains, in particular those of stress recognition and perceptions of management, which indicates that there is a need to improve patient safety in the study sites. Understanding the factors that influence

physicians' and nurses' attitudes will enable health care policy makers to design appropriate interventions to improve patient safety.

Table of Contents

Declaration	i
Acknowledgements	ii
Dedication	iii
Abstract	iv
List of Tables.....	xii
List of Figures	xiv
List of abbreviations.....	xv
Chapter 1: Introduction	1
1.1 Overview	1
1.2 Extent of the Problem	1
1.3 Research Aim and Objectives	4
1.4 Significance of this Study	4
1.5 Thesis Structure	5
1.6 Summary	6
Chapter 2: Background	7
2.1 Introduction.....	7
2.2 The Saudi Context.....	7
2.2.1 General overview.....	7
2.2.2 Health care system.....	9
2.2.3 The Medical Services Department.....	11
2.2.4 Efforts to improve patient safety.....	13
2.3 Concepts Related to the Study	14
2.3.1 Adverse events.....	14
2.3.2 Safety culture.....	16
2.3.3 Safety climate.....	21
2.3.4 Safety culture versus safety climate.....	21
2.3.5 Attitudes.....	22
2.4 Summary	25
Chapter 3: Literature Review	26
3.1 Introduction.....	26
3.2 Methods of Literature Review	26
3.2.1 Search strategy.....	26

3.2.2	Inclusion and exclusion criteria.....	27
3.2.3	Review results.....	27
3.3	Measuring Patient Safety Attitudes	28
3.3.1	Previous literature reviews.	28
3.3.2	Present review.....	30
3.4	Physicians' and Nurses' Attitudes Toward Patient Safety	34
3.4.1	Safety climate domain.	36
3.4.2	Teamwork climate domain.	38
3.4.3	Perception of management domain.	39
3.4.4	Job satisfaction domain.....	41
3.4.5	Working conditions domain.	42
3.4.6	Stress recognition domain.....	42
3.5	Explaining Differences in Physicians' and Nurses' Attitudes Toward Patient Safety	43
3.6	Relationship Between Physicians' and Nurses' Characteristics and Their Attitudes.....	44
3.7	Physicians' and Nurses' Attitudes Toward Patient Safety Initiatives	47
3.8	Summary	49
Chapter 4:	Methodology	51
4.1	Introduction.....	51
4.2	Research Design.....	51
4.3	Setting and Target Population.....	53
4.4	Research Permission and Ethical Considerations	54
4.5	Summary	55
Chapter 5:	Quantitative Phase Method	56
5.1	Introduction.....	56
5.2	Quantitative Sample.....	56
5.3	Exclusion criteria	56
5.4	Data Collection Tool.....	56
5.5	Data Collection Procedure	57
5.5.1	Access to study sites.	57
5.5.2	Administration of the SAQ.....	58
5.5.3	Follow-up.....	58
5.6	Quantitative Data Analysis	58

5.7 Summary	59
Chapter 6: Quantitative Phase Results	61
6.1 Introduction.....	61
6.2 Response Rate.....	61
6.3 Demographic Data	61
6.3.1 Profession.	62
6.3.2 Gender.....	62
6.3.3 Age group.	62
6.3.4 Nationality.	63
6.3.5 Job category.....	64
6.3.6 Level of education.	65
6.3.7 Years of experience in specialty.....	66
6.3.8 Years of work experience.	66
6.3.9 Clinical area.....	67
6.4 Patient Safety Domains.....	67
6.4.1 Participants' responses for each item in the six domains.	68
6.4.2 Overall responses for each patient safety domain.	74
6.5 Number of Participants with Positive Attitudes.....	75
6.6 Association Between Participants' Characteristics and Attitudes	77
6.6.1 Participants' gender.	77
6.6.2 Participants' nationality.....	78
6.6.3 Participants' job category.....	80
6.6.4 Participants' level of education.	81
6.6.5 Participants' years of experience in specialty.....	82
6.6.6 Participants' years of work experience.....	83
6.6.7 Participants' clinical area.....	84
6.7 The Quality of Collaboration and Communication	86
6.8 Open-ended Question.....	88
6.9 Summary	91
Chapter 7: Qualitative Phase Method	92
7.1 Introduction.....	92
7.2 Recruitment of Participants.....	92
7.3 Data Collection	93
7.4 Interview Schedule.....	93

7.5	Interview Process	94
7.6	Data Analysis	95
7.7	Validation of Qualitative Data	97
7.8	Summary	97
Chapter 8:	Qualitative Phase Results	99
8.1	Introduction	99
8.2	Participants' Characteristics	99
8.3	Differences Between Physicians' and Nurses' Attitudes	99
8.3.1	Workforce characteristics	100
8.3.2	Management practices	103
8.3.3	Professional culture	106
8.3.4	Patient safety practices	110
8.3.5	Work environment	113
8.4	Additional Findings	118
8.4.1	Miscommunication caused by language barriers	118
8.4.2	Diversity of experience	119
8.5	Summary	120
Chapter 9:	Discussion	122
9.1	Introduction	122
9.2	Physicians' and Nurses' Attitudes Toward Patient Safety	122
9.2.1	Workforce characteristics	125
9.2.2	Management practices	129
9.2.3	Professional culture	130
9.2.4	Patient safety practices	133
9.2.5	Work environment	134
9.3	Impact of Workforce Diversity	137
9.4	Summary	137
Chapter 10:	Conclusion and Recommendations	138
10.1	Introduction	138
10.2	Background	138
10.3	Summary of Overall Findings	139
10.4	Limitations	140
10.5	Contribution of the Study	140
10.6	Recommendations	141

10.6.1 Recommendations for policy.....	141
10.6.2 Recommendations for practice.	142
10.6.3 Recommendations for future research.....	143
10.7 Summary.....	143
References	145
Appendix A: Literature Search Findings	186
Appendix B: Safety Climate Surveys	235
Appendix C: Ethics Approval, Curtin University	247
Appendix D: Medical Services Department permission to undertake research.....	248
Appendix E: Information for Participants.....	249
Appendix F: Consent Form for Phase One	250
Appendix G: Consent Form for Phase Two	251
Appendix H: Permission To Use the SAQ.....	252
Appendix I: Safety Attitudes Questionnaire	253

List of Tables

Table 2.1: Hospitals and beds in all health sectors	9
Table 3.1: Articles identified in the initial search	26
Table 3.2: HSOPSC dimension, number of items and Cronbach's alpha coefficient	32
Table 3.3: SAQ domains, number of items, and Cronbach's alpha coefficient.....	34
Table 3.4: Patient safety domains	35
Table 5.1: Physicians and nurses working in the study sites	56
Table 6.1: Response rate of participants by hospital and profession	61
Table 6.2: Participants' profession.....	62
Table 6.3: Participants' gender	62
Table 6.4: Participants' age groups.....	63
Table 6.5: Participants categorised by nationality (Saudi/Non-Saudi)	63
Table 6.6: Participants categorised by nationality	64
Table 6.7: Participants' job category	65
Table 6.8: Participants' level of education.....	65
Table 6.9: Participants' years of experience in specialty	66
Table 6.10: Participants' years of work experience	66
Table 6.11: Participants' clinical area.....	67
Table 6.12: Teamwork climate domain items.....	69
Table 6.13: Safety climate domain items.....	70
Table 6.14: Job satisfaction domain items	71
Table 6.15: Stress recognition domain items	72
Table 6.16: Perceptions of management domain items	73
Table 6.17: Working condition domain items.....	74

Table 6.18: Participants' attitudes toward patient safety domains according to their profession	75
Table 6.19: Number of participants with positive attitudes	76
Table 6.20: Association between participants' attitudes toward patient safety domains and their gender	78
Table 6.21: Association between participants' attitudes toward patient safety domains and their nationality	79
Table 6.22: Association between participants' attitudes toward patient safety domains and their job category	81
Table 6.23: Association between participants' attitudes toward patient safety domains and their level of education	82
Table 6.24: Association between participants' attitudes toward patient safety domains and total years of experience in specialty	83
Table 6.25: Association between participants' attitudes toward patient safety domains and total years of work experience	84
Table 6.26: Association between participants' attitudes in patient safety domains and their clinical areas	85
Table 6.27: Collaboration and communication rated high/very high	87
Table 6.28: Number of participants who responded to open-ended question	88
Table 6.29: Physicians' recommendations for improving patient safety	89
Table 6.30: Nurses' recommendations for improving patient safety	90
Table 8.1: Characteristics of interviewees	99
Table 8.2: Themes and sub-themes emerging in phase two	100

List of Figures

Figure 2.1: Map of Saudi Arabia.....	7
Figure 2.2: Proportions of Saudi physicians and nurses in the MSD and other health care sectors.....	13
Figure 2.3: Reason's Swiss cheese model of accident causation.....	15
Figure 2.4: A three-aspects approach to safety culture.....	18
Figure 2.5: Safety culture characteristics.....	19
Figure 2.6: Typology of safety culture.....	20
Figure 2.7: General model to explain the nexus between attitudes and behaviours.....	23
Figure 3.1: An overview of the review process.....	27
Figure 4.1: Visual model for the study design.....	53
Figure 7.1: Stages of thematic analysis.....	95
Figure 9.1: Factors influencing physicians' and nurses' attitudes to patient safety.....	125

List of abbreviations

AE	Adverse Event
AHRQ	Agency for Health Care Research and Quality
CBAHI	Central Board of Accreditation for Health Institutions, Saudi Arabia
CCHSA	Canadian Council of Health Services Accreditation
FMAQ	Flight Management Attitudes Questionnaire
FraSiK	Frankfurt Patient Safety Climate Questionnaire for General Practice
GDP	Gross Domestic Product
HSC	Health and Safety Commission, UK
HSCQ	Hospital Safety Culture Questionnaire
HSOPSC	Hospital Survey on Patient Safety Culture
HTSSCS	Hospital Transfusion Services Safety Culture Survey
ICUMAQ	Intensive Care Unit Management Attitudes Questionnaire
IOM	Institute of Medicine
JCAHO	Joint Commission on Accreditation of Health Care Organisations
JCI	Joint Commission International
JHOP	Johns Hopkins Oxytocin Protocol
MOH	Ministry of Health, Saudi Arabia
MSD	Medical Services Department of Saudi Armed Forces
NHS	National Health Service, UK
NICU	Neonatal Intensive Care Units
NPF	National Patient Foundation
NPSA	National Patient Safety Agency, UK
OECD	Organisation for Economic Cooperation and Development
OR	Operating Room
ORMAQ	Operating Room Management Attitudes Questionnaire
PHC	Primary Health Care
PSCHO	Patient Safety Climate in Health Organisations
SAQ	Safety Attitudes Questionnaire
SCS	Safety Climate Survey
SLS	Strategies for Leadership Survey
T-TAQ	TeamSTEPPS Teamwork Attitudes Questionnaire
TPSAQ	Teamwork and Patient Safety Attitudes Questionnaire

TQM	Total Quality Management
TSCS	Teamwork and Safety Climate Survey
VHA PSCQ	Veterans Administration Patient Safety Culture Questionnaire
WHO	World Health Organisation
WTO	World Trade Organisation

Chapter 1: Introduction

1.1 Overview

This chapter introduces the study by providing a brief overview of the extent of safety and quality of care within the health care system. It outlines the study aim and objectives and explains the significance of the study before concluding with a brief description of its content and structure.

1.2 Extent of the Problem

Patient safety, which has been defined as “freedom from accidental injuries that result from medical care” (Kohn, Corrigan, & Donaldson, 2000, p. 211) has become a major concern of health care providers and policy makers worldwide. Substantial evidence from the literature has indicated that thousands of patients have experienced some sort of adverse event when they have been treated in hospitals (Anderson, Davis, Hanna, & Vincent, 2013; Baker et al., 2004; de Vries, Ramrattan, Smorenburg, Gouma, & Boermeester, 2008; Department of Health, 2000; James, 2013; Johnstone, 2007; Kohn et al., 2000; Michel, Quenon, Djihoud, Tricaud-Vialle, & de Sarasqueta, 2007; Vincent, 2010). In response, health care organisations worldwide have introduced different patient safety initiatives aimed at improving the safety and quality of care and minimising harm to patients in the health care system.

Preventable adverse events, “medical errors resulting in injury” (Kohn et al., 2000, p. 26), are a leading cause of death and injury. In the United States, for instance, the Institute of Medicine (IOM) report, *To Err is Human*, estimates that medical errors cause 44,000 to 98,000 deaths every year in US hospitals. In the United Kingdom a similar report, *An organisation with a memory: learning from adverse events in the NHS* estimates that approximately 850,000 adverse events (10% of admissions) occur annually in National Health Service (NHS) Hospitals (Department of Health, 2000). Since the publication of these two reports, many other official statements and reports on patient safety have been released (Vincent, 2010). A number of medical adverse events studies have been conducted in different countries, including Australia, Canada, New Zealand and the United Kingdom (Johnstone, 2007). According to Johnstone, findings from these studies indicate that between 4% and 16.6% of patients suffer from some kind of harm as a result of adverse events; and that about 50% of these adverse events were preventable.

In a review of clinical studies published between 1966 and 2007 of adverse events occurring in hospitals, de Vries et al. (2008) found that nearly one out of ten hospitalised patients had experienced an adverse event, many of which were preventable. Similarly, in a review of adverse events studies published in the United States between 2008 and 2011, James (2013) found that the number of deaths associated with preventable harm in hospitals was much higher than that estimated by the IOM in 1999. James estimated that more than 400,000 deaths per year in American hospitals were associated with preventable adverse events.

The high incidence of adverse events in hospitals is not limited to developed countries. Evidence from the literature indicates that thousands of hospitalised patients in developing countries' hospitals experience some sort of adverse event. Letaief, El Mhamdi, El-Asady, Siddiqi, and Abdullatif (2010) carried out a retrospective cohort study to estimate the incidence of adverse events in a Tunisian hospital. Six hundred twenty medical records were reviewed. The findings indicated that 62 inpatients experienced an adverse event, an incidence of 10%. In another Palestinian study, Najjar, Hamdan, Euwema, et al. (2013) found that 14.2% of hospitalised patients suffered adverse events; 59% of these events were preventable and 70% resulted in temporary harm.

Wilson et al. (2012) conducted a retrospective medical record review of hospital admissions in eight developing countries: Egypt, Jordan, Kenya, Morocco, Tunisia, Sudan, South Africa and Yemen. In this study, 15,548 patient records were reviewed and 8.2% showed at least one adverse event, with a range from 2.5% to 18.4% per country. Of these events, 30% were associated with death and 83% were preventable. The findings of Wilson et al. support a previous report by the World Health Organization (2005a) which indicates that a significant number of hospitalised patients in the Eastern Mediterranean region experienced some sort of adverse event.

While there has been a growing body of research estimating the number of adverse events in different countries, the scope of adverse events in the Saudi Arabian health care system is not well documented, and few studies have addressed this issue (AlJarallah & AlRowaiss, 2013; Al-Saeed, 2007, 2010; Samarkandi, 2006). In Saudi Arabia there are no official sources of accurate statistics detailing the estimated number of adverse events that have occurred in the health care system: the

only indication is the frequency of medical malpractice claims formally reported to legal authorities by patients or their relatives.

Over the last decade there has been an increase in medical malpractice claims in Saudi Arabia. According to Al-Saeed (2010), the total number of claims increased from 440 in 1999 to 1356 in 2008. AlJarallah and AlRowaiss (2013) reviewed 642 cases listed in the Medical Violation and Medical Jurisprudence Committees' records. These committees are responsible for investigating malpractice suits and violation of regulations in the Saudi health care system. The findings of AlJarallah and AlRowaiss (2013) indicated that death had occurred in 28% and permanent disability in 30% of the cases. Error with harm was found in 34.5% cases, and error with no identifiable harm only in 18.5%. No error was found in 34.1% of death cases and in 22.2% of permanent disability cases.

In order to minimise adverse events and minimise patient harm in health care systems, Kohn et al. (2000) have suggested that developing a culture of safety is a crucial step that would enable health care workers to focus on improving safety of care. A number of influential health care organisations such as the World Health Organization (WHO), National Patient Foundation (NPF), UK National Patient Safety Agency (NPSA), and the Agency for Health Care Research and Quality (AHRQ) have highlighted the need for health care organisations to measure health care workers' safety attitudes as an important approach to improving safety and minimising patient harm (Hofoss & Deilkas, 2008).

The assessment of workers' safety attitudes can help health care organisations to assess their safety culture and determine whether it promotes a high level of safety of care. The findings of this assessment will enable these organisations to identify areas where improvements in patient safety can be made. In addition, they will enable organisations to raise awareness of patient safety among health care workers, evaluate the effectiveness of patient safety interventions, track changes in safety culture over time, and benchmark patient safety status both internally, or externally with other health care organisations. The findings may motivate health care organisations to meet established directives or regulatory requirements to meet patient safety standards, such as those issued by the Joint Commission on Accreditation of Health Care Organisations (JCAHO) (Nieva & Sorra, 2003).

1.3 Research Aim and Objectives

The primary aim of this research is to explore clinicians' (physicians' and nurses') attitudes toward patient safety in Saudi Armed Forces hospitals. In order to achieve this, the following objectives will be addressed:

- identify physicians' and nurses' attitudes toward factors that can have an impact on patient safety
- determine whether these attitudes are different between the two professional groups
- identify and evaluate the association between physicians' and nurses' attitudes and their demographic characteristics (i.e., gender, nationality, job category, education, years in specialty, years of work experience, and work setting area)
- investigate the factors influencing patient safety culture in the Saudi Armed Forces hospitals.

1.4 Significance of this Study

The present study is significant in that it will add to the broader existing body of knowledge on patient safety, particularly in regard to the attitudes of physicians and nurses to patient safety and the extent to which differences exist between them. Understanding these differences and knowing what factors influence physicians' and nurses' attitudes will enable health care decision makers to target areas for improvement within the health care system.

Studies of patient safety in Saudi Arabia are limited. Only a few studies have been conducted to evaluate patient safety and to identify factors that have an effect on safety culture within health care organisations (Aboshaigah & Baker, 2013; Alahmadi, 2010; Al-Ahmadi, 2009; Mwachofi, Walston, & Al-Omar, 2011; Walston, Al-Omar, & Al-Mutari, 2010; Zakari, 2011). To date, no studies have been undertaken to evaluate health care workers' attitudes toward patient safety in the Saudi Armed Forces hospitals. The present study will be the first in-depth mixed-methods exploration of this topic, and will add to the limited body of knowledge on patient safety in Saudi Arabia.

Understanding the attitudes of physicians and nurses to patient safety, and determining to what extent these attitudes vary, will enable health care organisations to identify what can be done to improve patient safety. The present study will provide a general picture of the current status of patient safety culture in Saudi

Armed Forces hospitals, providing information for health decision makers in Saudi Arabia in general and the Medical Services Department of the Saudi Armed Forces (MSD) in particular to identify opportunities to improve patient safety. Providing this information also provides health decision makers with baseline data that can be used for evaluating future patient safety interventions in the Armed Forces hospitals.

The findings of the present study are significant in that they will add to the existing body of knowledge on patient safety, particularly in the context of how attitudes to patient safety in a multinational workforce may vary. In Saudi Arabia, the health care system, like other health care systems around the world, is characterised by its diverse multinational workforce. Exploring the association between health care workers' views of patient safety and their culture will add to the limited body of research about the influence of nationality and culture on health care and safety.

1.5 Thesis Structure

This thesis consists of ten chapters, which in general represent the stages of the study. This chapter provides an introduction to the topic. It describes patient safety within health care systems, and outlines the study aims and objectives, with emphasis of the significance of the study.

Chapter 2 provides a brief background on Saudi Arabia, including a description of the health care system, followed by an overview of the MSD. It presents general information on concepts related to this study, including adverse events and how incidents occur in the health care system, safety culture, safety climate, safety attitudes and the relationship between attitudes and behaviours.

Chapter 3 provides a comprehensive review of the literature relating to the purpose of this study. The aim is to uncover the most relevant knowledge relating to physicians' and nurses' attitudes toward patient safety and how these can be measured, and seeks to highlight gaps in the literature on these subjects. The review begins by detailing the approach taken to identify relevant literature, including the search terms and databases used. Findings from the literature review are presented in two sections: the first provides information about how to measure physicians' and nurses' attitudes, and the second presents the findings of the review related to these attitudes.

Chapter 4 describes the methodology used in this study. It describes in detail the study's sequential mixed methods design, beginning with a general background to mixed methods research, and the rationale for using the adopted design. The chapter also outlines study sites and target population. The research permission and ethical considerations are also addressed in this chapter.

Chapters 5 and 6 present the quantitative phase of the study, phase one. Chapter 5 describes the research methods undertaken, the study sample and the processes involved in collecting and analysing the data. Chapter 6 presents the results obtained from the Safety Attitudes Questionnaire (SAQ), and presents descriptive data of the study sample. Participants' attitudes toward patient safety are presented by identifying the number of participants with positive attitudes toward patient safety. Differences between physicians' and nurses' attitudes are identified and further analysis identifies the relationship between attitudes toward patient safety and participants' gender, nationality, job category, education, years in specialty, years of work experience, and work setting area.

Chapters 7 and 8 present the qualitative phase of the study, phase two. Chapter 7 describes the research methods used to conduct this phase, including participant recruitment and the data collection process. It also describes the process used to analyse the qualitative data, and how themes emerged. Chapter 8 presents the qualitative results of phase two, obtained from semi-structured interviews. In this chapter, the findings are presented with supporting quotes from participants.

Chapter 9 discusses the findings. The findings of both phases are interpreted and integrated, with relation to the study objectives. Thesis concludes in Chapter 10 by considering the limitations and contributions of the study. Recommendations for policy, practices and future research are presented at the end of the chapter.

1.6 Summary

This chapter introduced the study by providing a brief overview of the extent of safety and quality of care within the health care system. In this chapter, the study aim and objectives were presented and the significance of the study was outlined. The following chapter presents a brief background describing the setting in which this research takes place and describes some relevant concepts related to the study.

Chapter 2: Background

2.1 Introduction

This chapter is divided into two sections: the first provides a brief background to the context in which this research took place, including general overviews of Saudi Arabia, the Saudi health care system, and the MSD. The second section explores concepts related to the current study, such as how adverse events occur in the health care system, safety culture, safety climate and the differences between the two, and attitudes and their link to behaviours.

2.2 The Saudi Context

2.2.1 General overview.

The Kingdom of Saudi Arabia (KSA), the official name for Saudi Arabia, is the largest country in the Arabian Peninsula. It was established and unified by King Abdul Aziz Al-Saud in 1932. It is located in the southwest of Asia, occupying about 80% of the Arabian Peninsula, with a total area of 830,000 square miles (2,150,000 square kilometres). Saudi Arabia is bordered by the Arabian Gulf, the United Arab Emirates and Qatar on the east, and the Red Sea on the west. To the north are Jordan, Iraq, and Kuwait; Yemen and Oman form the southern borders (Figure 2.1) (Ministry of Foreign Affairs, 2013)



Figure 2.1: Map of Saudi Arabia

Source: University of Texas (2015)

Politically Saudi Arabia is a monarchy. The king holds authority in the political system. Saudi legislative law is based on Islamic law. In March 1992, the late king Fahd bin Abdul Aziz introduced a national Consultative Council, *Majlis Al-Shura*, as one of the ruling methods in the nation, and it currently has an important role in the political system. It makes decisions, and provides opinions on general political issues concerning the country, and has authority to study Saudi systems and international agreements between the government and other countries (Ministry of Foreign Affairs, 2013).

The Saudi economy developed rapidly after the discovery of oil in 1938. It has the largest oil reserves worldwide, accounting for 18% of the world's proven petroleum reserves (Organization of the Petroleum Exporting Countries, 2015). Oil is the main export, making up 85% of Saudi exports (Central Department of Statistics & Information, 2012). The petroleum sector provides 80% of government revenues and 45% of Gross Domestic Product (GDP) (Central Intelligence Agency, 2013). National and international enterprises are encouraged by the government, and contribute to economic growth. In order to attract foreign enterprises, Saudi Arabia joined the World Trade Organization (WTO) in December 2005 (Jannadi, Alshammari, Khan, & Hussain, 2008). At present, the Saudi economy is one of the fastest growing worldwide.

The population of Saudi Arabia has expanded significantly over the last few decades. According to the 2010 census, the total population was 27.2 million, in contrast with 22.7 million in 2004, 21 million in 1999 and 13 million in 1985. Saudi citizens form 68.9% of the population (18.7 million): 50.9% male and 49.1% female. Foreign residents form the other 31.1% (8.43 million). The majority (70.4%) of non-Saudi residents are male (Central Department of Statistics & Information, 2010). The reason for the increasing number of foreigners in Saudi Arabia is their growing interest in the local investment sectors. There are a large number of expatriates working in different professions, mainly from Egypt, Yemen, India, Pakistan and Philippines (Ministry of Foreign Affairs, 2013).

Saudi culture is mainly shaped by Islamic religious beliefs (Al-Shahri, 2002); all citizens practise Islam (Aldossary, While, & Barriball, 2008). Islamic beliefs are expressed in all daily activities of the Saudis, and in the legal system (Al-Shahri, 2002). The main spoken language is Arabic. Family ties are an important element in Saudi culture. In the Islamic context, Muslims are encouraged to keep contact with

family members (i.e., grandparents, uncles, aunts). They are expected to visit them regularly and offer them support when needed. They are also expected to be compassionate to them and show them appropriate respect and cheerfulness (Al-saggaf, 2004).

2.2.2 Health care system.

Health care services in Saudi Arabia have improved over the last two decades (Al-Saeed, 2010; Almalki, Fitzgerald, & Clark, 2011). Organised health care services commenced in 1926 after the late king Abdul Aziz issued a decree creating a health department, later renamed in 1951 as the Ministry of Health (MOH) (Mufti, 2000). Since that time, health care services in Saudi Arabia have developed significantly. Today, there are more than 445 hospitals, 268 operated under the MOH and the remainder by other governmental agencies and the private sector (Ministry of Health, 2013). The total number of hospitals and beds in all health sectors are presented in Table 2.1.

Table 2.1: Hospitals and beds in all health sectors

	Year							
	2010		2011		2012		2013	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
MOH	249	34370	251	34450	259	35828	268	38970
Other Governmental	39	10939	39	10948	39	11043	39	11497
Private Sector	127	12817	130	13298	137	14165	136	14310
Total	415	58126	420	58696	435	61036	445	64777

Source: Ministry of Health (2013)

The MOH is the main provider of health care. It provides 60% of health care services, and the rest are provided by private sector and other governmental agencies such as Medical Services Department of the Ministry of Defence, Medical Services of the Ministry of Interior, National Guard Medical Health Affairs, university hospitals, and the King Faisal Specialist Hospital and Research Centre (Al-Yousuf, Akerele, & Al-Mazrou, 2002; Almalki et al., 2011; Walston, Al-Harbi, & Al-Omar, 2008; World Health Organization, 2006). Health care is provided free of charge to all

citizens by the MOH, which has a well-defined, decentralised organisational structure (Al-Yousuf et al., 2002; Almalki et al., 2011). The MOH exercises authority over all public health care facilities except those operated by other governmental providers, and is responsible for managing, planning and formulating health policies and supervising all health programmes. In addition, it supervises and monitors health services in the private sector (Al-Yousuf et al., 2002).

Over the past several years, the private health sector in Saudi Arabia has grown rapidly, a result of large incentives offered by the government (Berhie, 1991; Walston et al., 2008) such as interest free loans to construct facilities (Walston et al., 2008). The number of private hospitals has increased from 18 in 1971 (Walston et al., 2008) to 136 in 2013 (Ministry of Health, 2013). These are operated by different organisations or by individual owners, mainly physicians or other health professionals who have a desire to expand their practice in the private sector (Berhie, 1991).

Saudi health care services, like other health care services around the world, are organised into primary, secondary and tertiary care (Mufti, 2000). The first line is primary health care services (PHC), which are provided through an extensive network of centres: 2,259 such centres were in operation in 2013. On average, each centre provides health services to 13,455 people (Ministry of Health, 2013). With the exception of emergency cases, health care services at secondary and tertiary level require a referral from a PHC.

This system is challenged by a shortage of Saudi health care workers such as physicians and nurses, and the majority of health care workers are expatriates (Al-Yousuf et al., 2002; Almalki et al., 2011; Jannadi et al., 2008; World Health Organization, 2006). Figures from the MOH indicate that only 22.4% of physicians and 35% of nurses working in the country are Saudis; this includes those working in all health sectors (Ministry of Health, 2013).

Many expatriate health care workers do not speak Arabic and their cultural backgrounds are different from that of the Saudi patients they care for. Most expatriate nurses are Filipino and Indian; others are recruited from Australia, South Africa, the United Kingdom, the United States, and other Middle Eastern countries (Aldossary et al., 2008; Almutairi & McCarthy, 2012). Although having a multinational workforce provides an excellent environment for the exchange of

experience, it constitutes a challenge to the delivery of care caused mainly by language barriers and cultural differences (Arabi & Shimemeri, 2006).

The inadequacy of communication created by language differences between health care workers and patients has been demonstrated to be a barrier to effective and safe patient care. Some patients may not be able to express their feeling of pain adequately, while some health care workers may not be able to explain health care procedures to a patient, as is required in the delivery of care. Expatriates' limited knowledge of Saudi culture can also affect the delivery of care, with cultural conflict resulting from interactions between expatriate workers and their patients. Understanding Saudi culture can help health care workers enhance their relationship with patients and minimise potential conflict resulting from cultural differences (Almutairi & McCarthy, 2012).

In order to overcome the shortage of Saudi health care workers, the government has adopted several strategies, including the introduction of new medical and nursing schools, the development of new training centres, and scholarship programmes to train medical staff overseas. The government has also encouraged the private sector to establish health colleges and medical schools (Jannadi et al., 2008). In 2013 the number of graduates of university medical and health colleges was 6,482; female graduates represented 50% of this number, and about 97% of graduates were Saudis. The total number of students enrolled in university medical and health colleges was 53,892, with around 98% of them Saudis. Female students represented 50% of all students (Ministry of Health, 2013).

2.2.3 The Medical Services Department.

The MSD is the second largest health care provider in Saudi Arabia, with a total of 5215 hospital beds, 4930 physicians and 11731 nurses (Ministry of Health, 2013). The MSD mission is “the provision of remedial and preventive medical services of the highest possible standard to its personnel and their families in times of war and peace” (Mufti, 2000, p. 12).

Historically, the MSD was established in 1948. The first military medical unit, called Army Medicine, was established in Taif city with a capacity of 10 beds. In 1951 Prince Mansour Military Hospital was established as the first military hospital, opening with a capacity of 36 beds and ending the year with 100 beds. Army Medicine was renamed Military Health in the same year. In 1954, Riyadh Armed

Forces Hospital opened with 385 beds. In 1963 Military Health was again renamed, to become the Medical Services Department, and in 1973 become known as the Directorate General of Medical Services of the Armed Forces, expanding its services to include all armed forces (Medical Services Department, 2015).

MSD activities are not limited to the provision of health care services, but it also participates in the development of health care services throughout the country through medical education. MSD has established a number of military medical schools and training centres to provide skilled personnel to work in armed forces or other public hospitals.

In 1958 the first military nursing school was established in Taif city. Currently, this school is known as Armed Forces Medical Services School and is located in Al-Karj city. It is the premier supplier of qualified military technical support personnel (Medical Services Department, 2015).

In 1988 the MSD established the Prince Sultan Military College of Health Sciences in Dhahran. This academic military college offers a number of health care programmes including clinical laboratory science, emergency medical technology, respiratory care, dental and oral health, nursing, biomedical technology, health information management and health services administration (<http://psmchs.edu.sa>).

In 1998 the MSD established another advanced academic institution, the Prince Abdurrahman Advanced Dental Studies Institute, in Riyadh city. It is the first organisation to offer an advanced dental specialty in the Gulf region, providing a diploma that allows its graduates to join Saudi dental fellowship programmes. This institute is linked with the University of Southern California, one of the most prestigious American universities in this specialty (Medical Services Department, 2015).

The MSD, like other health service providers in Saudi Arabia, has been challenged by a shortage of Saudi health care workers, in particular nurses. Figures from the MOH indicate that only 44.7% of physicians and 18.1% of nurses working in military hospitals are Saudis (Ministry of Health, 2013). Figure 2.2 shows the proportions of Saudi physicians and nurses in the MSD and other health care providers.

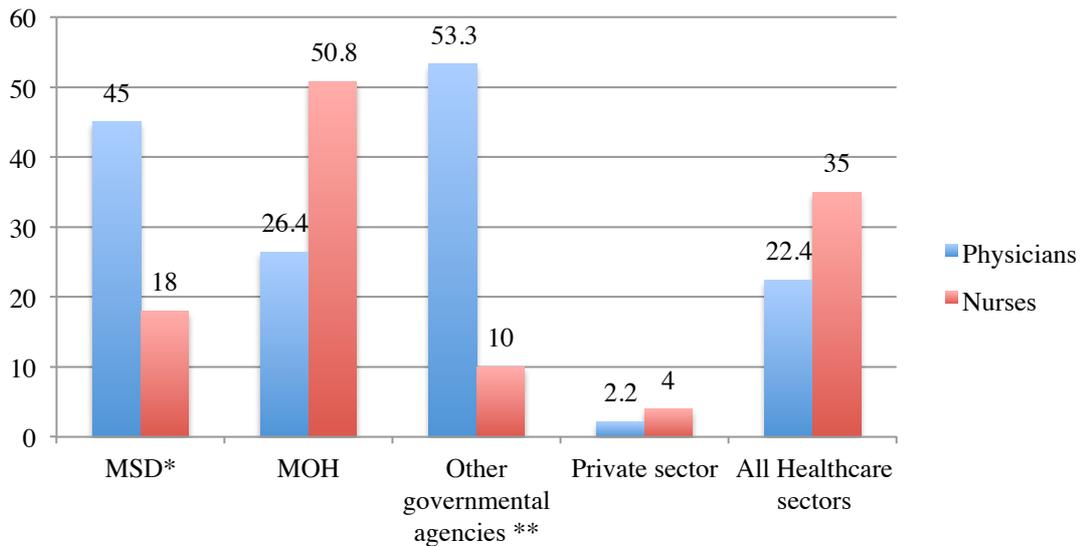


Figure 2.2: Proportions of Saudi physicians and nurses in the MSD and other health care sectors.

* Represents data from year 2011, because of the absence of data for 2012 and 2013

** Including the MSD

2.2.4 Efforts to improve patient safety.

Patient safety issues have received increasing attention over the last decade (Zakari, 2011). In an effort to improve safety and the quality of care in the health system several initiatives have been introduced, including patient safety and quality training programmes, the establishment of national standards, and the introduction of an accreditation system (Alahmadi, 2010; Walston et al., 2010). In the early 2000s the MOH created a specific directorate to lead in the education and training of health care workers, and in the improvement of patient care. Since the establishment of this directorate, many patient safety and quality training programmes have been conducted (Walston et al., 2010).

In 2006 the government established the Central Board for Accreditation of Health Care Institutions (CBAHI) as a necessary step to improve safety and quality of care. The CBAHI is responsible for developing national standards of care delivered by all health care providers. Its responsibilities also include the assessment of health care providers' compliance with these standards, and granting quality certificates to both government and private facilities based on the assessment (Saudi Central Board for Accreditation of Health Care Institutions, 2015). Currently, CBAHI accreditation is mandatory for all health care institutions in Saudi Arabia. In

effort to improve safety and quality of care, today many Saudi hospitals are also pursuing international accreditation, such as the Joint Commission International (JCI) and Canadian Council of Health Services Accreditation (CCHSA) (Walston et al., 2010).

The MSD is an integrated part of the health care system and works in coordination with other agencies to provide safe and quality care to all citizens and residents of Saudi Arabia. It has introduced several initiatives to improve the safety and quality of care in Saudi Armed Forces hospitals. In 2000 it developed Total Quality Management (TQM) standards to ensure that patients were able to access high quality care, and in 2001 the MSD established the Quality Development Office, renamed to the Total Quality Management Department in 2007 (Medical Services Department, 2009b). At present this department is known as the Department of Quality and Patient Safety Improvement, and is responsible for promoting and monitoring quality and safety standards in all Saudi Armed Forces hospitals. In an effort to improve safety and quality of care, the MSD aims to obtain JCI accreditation, considered the world leader for quality care and patient safety; recently four facilities have obtained JCI certification (Haydar, 2015).

2.3 Concepts Related to the Study

It is important to outline some of the main concepts relating to this study, including adverse events and how incidents have occurred in the health care system, safety culture, safety climate, and the difference between these concepts, and attitudes and their links to behaviours.

2.3.1 Adverse events.

In the health care system an adverse event (AE) is defined 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 health care management rather than by the patient’s underlying disease process” (Baker et al., 2004, p. 1679). It is not related to a particular discipline or area and can occur anywhere in the system, and it can be classified into two main types. The first type of AE results from errors of commission, which involve doing things such as misreading a label or administering the incorrect drug. The second type results from errors of omission, which involve a failure to do what should be done, such as not undertaking a necessary diagnosis or

treatment (Baker et al., 2004; Sutker, 2008). In health care services, the most common AEs are those resulting from errors of omission rather than of commission (Baker et al., 2004).

Understanding how errors occur enables health care organisations to minimise them and prevent harm to patients (Morath & Turnbull, 2005). One of the most useful tools developed to understand how multiple small failures of the health care system combine to create an error is Reason's Swiss cheese model of accident causation (Figure 2.3) (Morath & Turnbull, 2005). Reason (2000) has suggested that the health care system, like any other high technology system, has many defensive layers or barriers working in an effective way to minimise error occurrence. Within these layers are a number of holes, representing active failures and latent conditions (Reason, 2000). If these holes line up, an incident will occur.

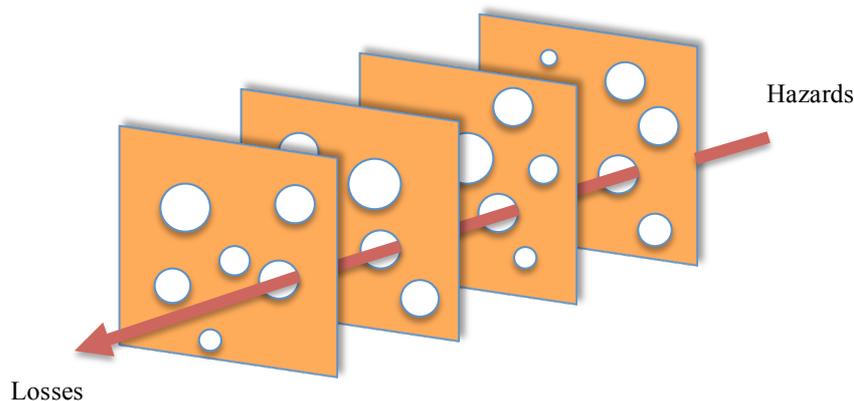


Figure 2.3: Reason's Swiss cheese model of accident causation

In health care systems, active failures occur as “unsafe acts performed by people” who work at the sharp end of the system and are in direct contact with patients (Kohn et al., 2000; Reason, 2000); the effects of this type of failure are felt almost immediately (Kohn et al., 2000). However, latent conditions may remain invisible and hidden in the system for years before they create an opportunity for an incident to occur (Reason, 2000). In health care systems, latent conditions include things such as “poor design, incorrect installation, faulty maintenance, bad management decisions, and poorly structured organisations” (Kohn et al., 2000, p. 55). In the workplace such conditions can translate into an error-provoking environment: they may be such things as time pressure, staff shortages, inadequate equipment, fatigue, inexperience or unworkable procedures (Reason, 2000). In the

health care system, latent conditions pose more threats to safety because they are often hidden, unrecognised, and have the capacity to result in several types of active failure (Kohn et al., 2000).

The traditional response to incident occurrence tends to focus on individuals who are directly involved with the delivery of care and punishing them (i.e., blaming, firing or suing them) (Kohn et al., 2000; Reason, 2000; Wachter, 2008). Evidence suggests that such responses are not an effective way to prevent recurrence of errors. Focusing only on the unsafe acts of individuals lets latent conditions remain hidden in systems without detection or rectification, and their accumulation makes systems more vulnerable to failure in the future (Kohn et al., 2000; Reason, 2000).

In order to minimise AEs and prevent harm to patients, responses to incident occurrence need to shift from the focus on individuals to a focus on preventing errors in future by designing a safer system that actively looks for and fixes latent conditions (Kohn et al., 2000). Kohn et al. (2000) have indicated that “preventing errors and improving safety for patients require a systems approach in order to modify the conditions that contribute to errors” (p. 49). Health care organisations can apply lessons learnt by other high-risk organisations such as aviation and nuclear power, which have made significant improvements in safety (Friesen, Farquhar, & Hughes, 2005). These improvements have contributed to the development of a safety culture, which becomes the main determinant of safety in such organisations (Hudson, 2003; Singer et al., 2003).

2.3.2 Safety culture.

The first appearance of “safety culture” as a recognised term was in the 1987 OECD Nuclear Agency report following the Chernobyl disaster in 1986 (Cooper, 2000). Since then many definitions of safety culture have been offered. According to Glendon, Clarke, and McKenna (2006), the most widely used working definition is that of the UK Health and Safety Commission (HSC):

the product of individual and group values, attitudes, competencies, and patterns of behaviours that determine the commitment to, and the style and proficiency of, an organisation’s health and safety management. (Health and Safety Commission, 1993, p. 23)

In the literature there is considerable disagreement about how to define safety culture and whether or not it is different concept from safety climate (Wiegmann, Zhang, Thaden, Sharma, & Gibbons, 2004). In a review conducted to summarise reports and studies carried out to define and assess safety culture, Wiegmann et al. (2004) reported thirteen different definitions of safety culture; however, they indicated that these definitions had a common set of critical features:

Safety culture is a concept defined at the group level or higher, which refers to shared values among all the group or organisation members; Safety culture is concerned with formal safety issues in organisation and closely related to, but restricted to, the management and supervisory systems; Safety culture emphasizes the contribution from everyone at every level of organisation; The safety culture of an organisation has an impact on its member's behaviours at work; Safety culture is usually reflected in the contingency between reward systems and safety performance; Safety culture is reflected in an organisation's willingness to develop and learn from errors, incidents, and accidents; and Safety culture is relatively enduring, stable and resistant to change. (Wiegmann et al., 2004, p. 123)

In effort to understand safety culture, Cooper (2000) offered a new model to assess and analyse it. It includes three elements: subjective internal psychological factors (attitudes and perceptions), observable ongoing safety-related behaviour, and objective situational features. Each of these elements is assessed by common methods; for example, safety climate surveys are used to assess internal psychological factors, checklists are used to assess safety-related behaviour, and safety management system audits or inspections are used to assess situational features (Cooper, 2000). Based on this, Human Engineering (2005) designed a new framework, including safety culture definition and the three elements of Cooper's model (Figure 2.4).

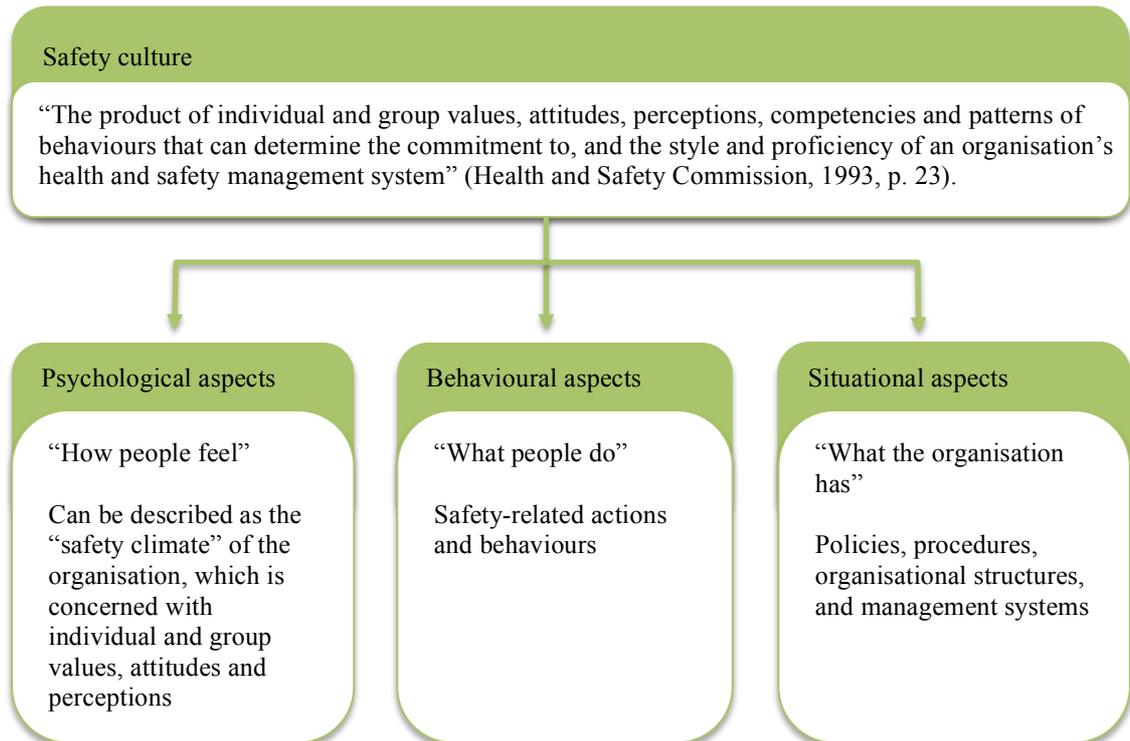


Figure 2.4: A three-aspects approach to safety culture

Source: Human Engineering (2005, p. 4)

In this framework, psychological aspects refer to “how people feel about safety and safety management systems ... it can be described as the safety climate of the organisation” (Human Engineering, 2005, p. 3). They include the beliefs, attitudes, values and perceptions of individuals and groups at all levels of an organisation and can be measured subjectively using safety climate surveys, often used to explore a workforce’s attitudes and perceptions toward safety at a particular point of time. Behavioural aspects are focused on “what people do within the organisation, and include safety-related activities, actions and behaviours exhibited by employees” (Human Engineering, 2005, p. 4). Situational aspects are “what the organisation has”, they describe organisational elements such as policies and procedures, management and control systems, and communication and workflow systems (Human Engineering, 2005, p. 4).

Safety culture in health care systems is widely recognised as a strategy that should be adopted to improve the safety of care and to prevent the recurrence of adverse events (Pronovost & Sexton, 2005). It has been identified as the main determinant of a health care organisation’s ability to prevent and mitigate errors (Institute of Medicine, 2001). The IOM has emphasised the need for health care

organisations to develop a safety culture “such that an organisation’s care processes and workforce are focused on improving the reliability and safety of care for patients” (Kohn et al., 2000, p. 14).

Safety culture development requires an understanding of safety culture characteristics. In describing how to develop such a culture, Reason (1997) identified five essential characteristics (Figure 2.5). Reason (1997) considered that an organisation with a positive safety culture will have an informed workforce with an effective safety information system which collates and analyses data about incidents and near misses. It will have a culture of reporting in which people who are in direct contact with hazards are willing to report their own errors and near misses; and this depends on how errors and near misses are handled. Organisations need a “just culture” where people are encouraged to report errors and near misses and are rewarded for doing so, rather than receiving blame and punishment. A culture of learning is another characteristic of safety culture, where people have the ability to draw the right decisions from the organisation’s safety information system and thereby improve safety. Organisations must also have a flexible culture that enables them to respond appropriately to a fast-changing environment.



Figure 2.5: Safety culture characteristics

In the health care system, safety culture tends to be reactive. Hudson (2001) has classified safety culture into five types: pathological, reactive, calculative, proactive, and generative (Figure 2.6). Pathological culture is characterised by people whose attitude is, “Why do we need to waste our time on risk management

and safety issues?” (Wolff & Taylor, 2009, p. 194) This type of culture views workers as the main cause of safety problems. Reactive culture regards safety as a serious issue, but only after an incident has occurred. Calculative culture often has systems for managing possible accidents, usually initiated by management rather than the workforce. Unlike calculative culture, workforces in proactive cultures are involved in safety initiatives from the start and can anticipate safety problems before they emerge. Generative culture has high safety standards and is characterised by active participation at all levels of the workforce, and safety is perceived as an integral part of their business (Hudson, 2003; Parker & Hudson, 2001; Parker, Lawrie, & Hudson, 2006; Wagner, 2008; Wolff & Taylor, 2009).

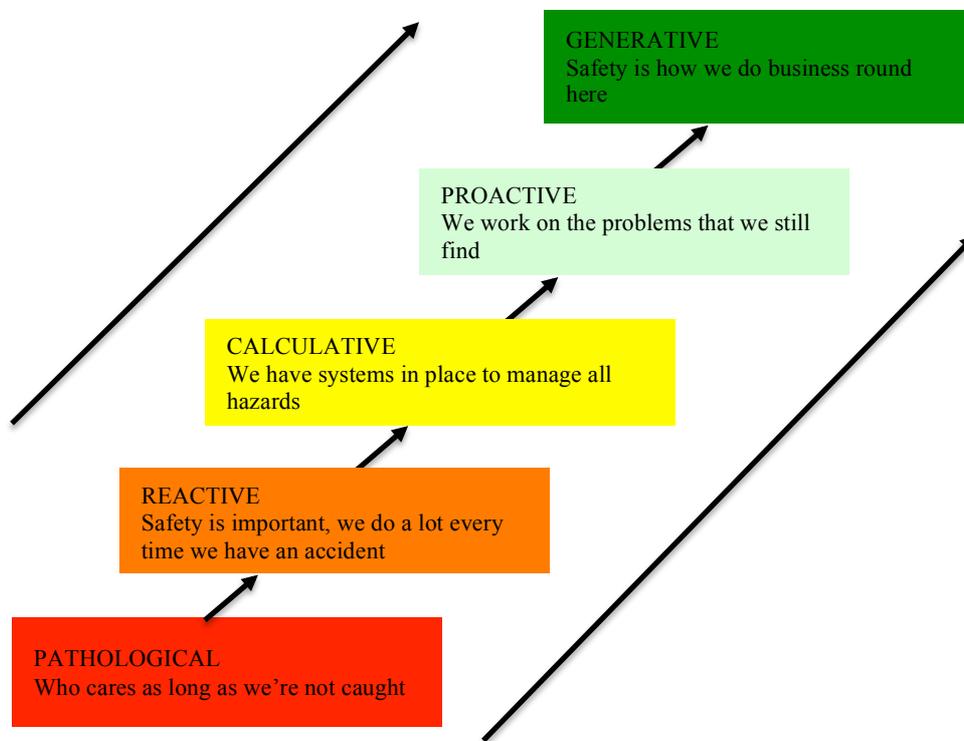


Figure 2.6: Typology of safety culture

Source: Hudson (2003, p. i9)

In accordance with this model, Hudson (2003) has argued that the lack of systematic risk management suggests that the culture of safety in health care is reactive, not pathological, as medical errors are taken seriously. The reluctance of health care professionals to adopt evidence-based health care practices suggests that safety culture is not calculative, as does the unwillingness of health care workers to follow protocols or procedures. In comparison with other high reliability

organisations such as aviation, oil and gas industries, which are both calculative and proactive, health care ranks low (Hudson, 2003).

2.3.3 Safety climate.

Safety climate as a concept was first proposed by Zohar in 1980 (Wiegmann et al., 2004) and was defined as a particular type of organisational character that reflects employees' perceptions about the relative importance of safe conduct in their occupational behaviour. It can vary from highly positive to a neutral level, and its average level reflects the safety climate in a given company. (Zohar 1980, p. 96)

Since then, many definitions of safety climate have been developed. Wiegmann et al. (2004) noted that there were many definitions of safety climate, some almost similar to definitions of safety culture. Many emphasise common features of safety climate:

Safety climate is a psychological phenomenon that is usually defined as the perceptions of state of safety at a particular time; Safety climate is closely concerned with intangible issues such as situational and environmental factors; Safety climate is a temporal phenomenon, a "snapshot" of safety culture, relatively unstable and subject to change. (Wiegmann et al., 2004, p. 124)

2.3.4 Safety culture versus safety climate.

In safety literature, the concepts of "safety climate" and "safety culture" are often used interchangeably (Cox & Flin, 1998; Flin, 2003; Glendon & Stanton, 2000; Guldenmund, 2000; Mearns & Flin, 1999), but several authors have emphasised the need to differentiate between these two concepts (Cox & Flin, 1998; Flin, 2003; Guldenmund, 2007; Mearns & Flin, 1999). Mearns and Flin (1999) have argued that safety climate describes employees' attitudes, perceptions, and beliefs about safety, and can be measured by quantitative methods that provide a general picture of the current state of safety, whereas safety culture is a more complex and enduring trait reflecting shared beliefs, values, and underlying assumptions and expectations, which require more in-depth investigation.

In 2000 Guldenmund reviewed the literature related to safety climate and safety culture; he found that these concepts were still ill defined. Guldenmund has argued that the two are distinct, in that a safety climate is represented by safety

attitudes whereas a safety culture is represented by the strong beliefs that underlie the attitudes (Guldenmund, 2000). He also has argued that the former is a superficial manifestation of the latter, and can be assessed by a questionnaire survey (Guldenmund, 2007).

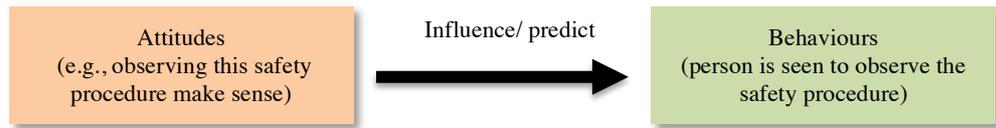
2.3.5 Attitudes.

In health care systems, the ability of health care organisations to prevent medical errors is influenced by workers' attitudes and beliefs about safety. Øvretveit (2009) has indicated that a strong safety culture dictates the type of attitudes required to ensure that adverse events and medical errors are reported, discussed and prevented. This makes it necessary to define attitudes and recognise how they are formed.

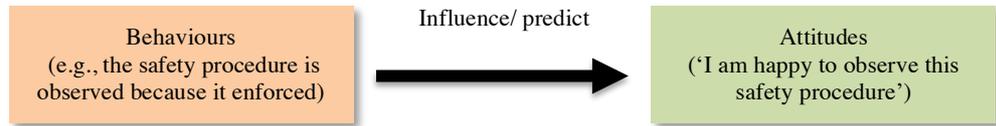
Attitudes can be defined as one's "predisposition to respond in a positive or negative way to someone or something in one's environment" (Schermerhorn, Hunt, & Osborn, 1994, p. 139). Attitudes can be inferred from what people say in informal or formal statements, or from the way they behave (Schermerhorn et al., 1994). They are formed during a lifetime of direct experiences, social learning from family, peer groups, religious organisations and culture. They are also formed by observing the behaviours of others (Nelson & Quick, 2003).

Attitudes are complex and composed of cognitive, affective and behavioural components. Cognition refers to antecedent beliefs and values about someone or something, whereas affect reflects a specific feeling about the personal impact of the antecedents. This feeling is the actual attitude itself, such as "I don't like my job." The intent to behave in a certain way toward an object or person, based on specific personal feelings or attitudes, is the behavioural component of an attitude (Schermerhorn et al., 1994). Describing attitude as having three components helps to clarify its complexity and its link to behaviours (Robbins, 1996).

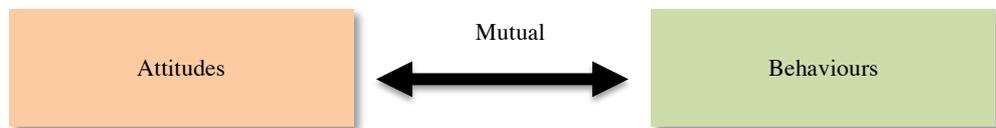
In an effort to understand the link between attitudes and behaviours, a number of models have been developed to explain how attitudes can be used to predict behaviours, how behaviours influence attitudes, and how other factors can have an effect on both (Glendon et al., 2006). Glendon et al. (2006) have described four models as acceptable explanations of the relationship between attitudes and behaviours (Figure 2.7).



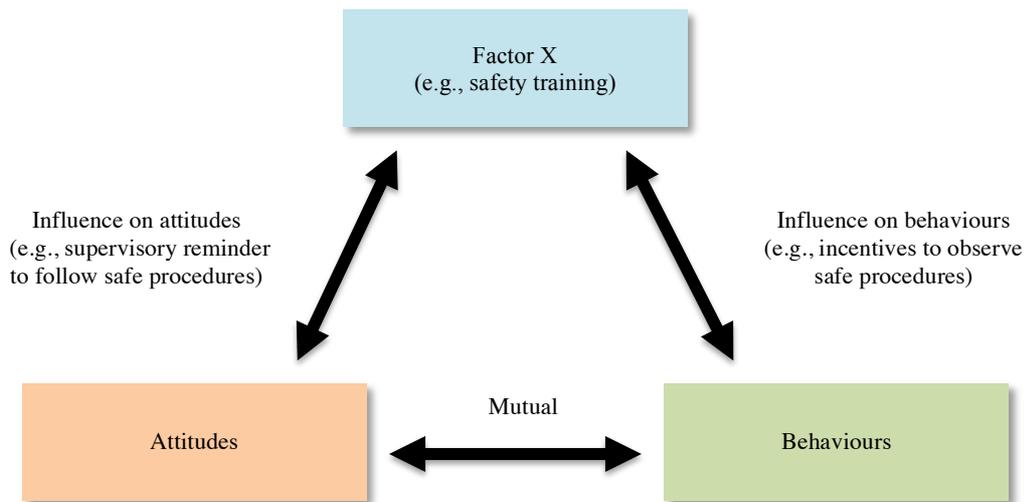
Attitudes influence behaviours model



Behaviours influence attitudes model



Mutual influence/reinforcement model of attitudes and behaviours link



A mutual influence model of attitudes-behaviours link

Figure 2.7: General model to explain the nexus between attitudes and behaviours

The first model proposes that attitudes influence behaviours. This model explains how a person’s attitude can predict their behaviour. Glendon et al. (2006) have argued that this is limited, in that a person cannot change behaviours merely by expressing his or her attitudes. For example, expressing a positive attitude to following safety procedures is not sufficient to change a person’s behaviour with respect to compliance. The second model contends that behaviours influence

attitudes. This model can be used to change person's attitude about something (e.g., following safety procedures) by obliging them to behave in a particular way as a result of enforcement through new legislation or rules. This model is based on the theory that there is consistency between a person's attitudes and behaviours. The third model introduces mutual influence/reinforcement. In this model, attitudes and behaviours are mutually reinforcing. As a bidirectional model it explains the influence of attitudes on behaviours and vice versa. This is based on the premise that individuals endeavour to reduce or eliminate inconsistency between their attitudes and behaviours; changing either factor will result in a change in the other. In the fourth model, attitudes and behaviours are likely to be mutually consistent, but independent. It is characterised by the notion of consistency between attitudes and behaviour. This model considers other factors that might influence both attitudes and behaviours (Factor X). For example, safety training might be designed to address employees' attitudes toward safety, and the safety behaviours they adopt, within a specific unit of the organisation. Generally, understanding these various concepts is helpful in understanding health care workers' attitudes toward patient safety.

For the purpose of this thesis the following terms are used:

- Adverse event: "an unintended injury or complication that results in disability at the time of discharge, death or prolonged hospital stay and that is caused by health care management rather than by the patient's underlying disease process" (Baker et al., 2004, p. 1679).
- Safety culture: a "sub-facet of organizational culture, which is thought to affect member's attitudes and behaviours in relation to an organization's ongoing health and safety performance" (Cooper, 2000, p. 111).
- Safety climate: a measurable aspect of culture of safety within an organisation, which can be recognised from the attitudes and perceptions of the workforce at a given point in time (Flin, Burns, Mearns, Yule, & Robertson, 2006; Flin, Mearns, O'Connor, & Bryden, 2000; Guldenmund, 2000).
- Attitude: the "predisposition to respond in a positive or negative way to someone or something in one's environment" (Schermerhorn et al., 1994, p. 139).

2.4 Summary

This chapter provided an introduction to the Saudi context, including a general overview of Saudi Arabia, introductory information about health care services, and a brief outline of the Medical Services Department of the Saudi Armed Forces. The second part provided a general background to several concepts related to this study, including adverse events and how incidents occur in the health care system, safety culture, safety climate, attitudes, and the link between attitudes and behaviours. Understanding these concepts is helpful to understand health care workers' attitudes to patient safety.

In the following chapter, the findings of the literature review relating to physicians' and nurses' attitudes toward patient safety will be presented.

Chapter 3: Literature Review

3.1 Introduction

This chapter details an in-depth review of the literature relevant to the inquiry of the present study. Its purpose is to uncover the most relevant knowledge relating to physicians' and nurses' attitudes toward patient safety and how they can be measured. It highlights gaps in the literature and guides the direction of this study. This chapter begins by detailing the main approach undertaken to identify relevant literature, including search terms, databases reviewed, and the inclusion and exclusion criteria used to identify the most relevant studies. Findings from the literature review are then presented.

3.2 Methods of Literature Review

3.2.1 Search strategy.

In order to ensure comprehensiveness and rigour of the literature search a systematic approach to the review was undertaken. To identify academic studies relevant to the study purpose, electronic databases including Medline and Psychinfo were searched. The search terms and key words ('patient safety' OR 'safety culture' OR 'safety climate') AND (attitude*) AND (health OR healthcare OR 'health care') AND (provider* OR personnel* OR worker* OR employee*) AND (measur* OR assess* OR evaluat* OR explor*) were used. Table 3.1 shows the number of articles identified in the initial search.

Table 3.1: Articles identified in the initial search

		Medline	Psychinfo
1	('patient safety' OR 'safety culture' OR 'safety climate')	18693	2450
2	attitude*	344302	344491
3	(health OR healthcare OR 'health care') AND (provider* OR personnel* OR worker* or employee*)	311589	97066
4	(measur* OR assess* OR evaluat* OR explor*)	5636285	1484593
4	1+2+3+4	894	174

In addition to using electronic databases to highlight relevant references, hand searching of the reference lists of the papers identified was undertaken to check for other relevant studies.

3.2.2 Inclusion and exclusion criteria.

An initial search of electronic databases revealed 1086 academic articles. Duplicates were removed and the title and abstract of the remaining articles were read to identify their relevance to the study. To narrow the review to the most relevant articles, inclusion and exclusion criteria were applied. The selection of studies was restricted to (1) those written in English, and (2) those examining physicians' and nurses' attitudes toward patient safety in general, or a particular aspect of patient safety. Studies that focused on physicians' and nurses' attitudes toward a particular medical device, a new-implemented system or technology were excluded; studies targeting medical or nursing students were also excluded, as well as those studies conducted in nursing homes or community living centres.

3.2.3 Review results.

Following the application of the inclusion/exclusion criteria and the removal of duplications, a total of 173 articles were identified for the review. Figure 3.1 shows an overview of the literature review process.

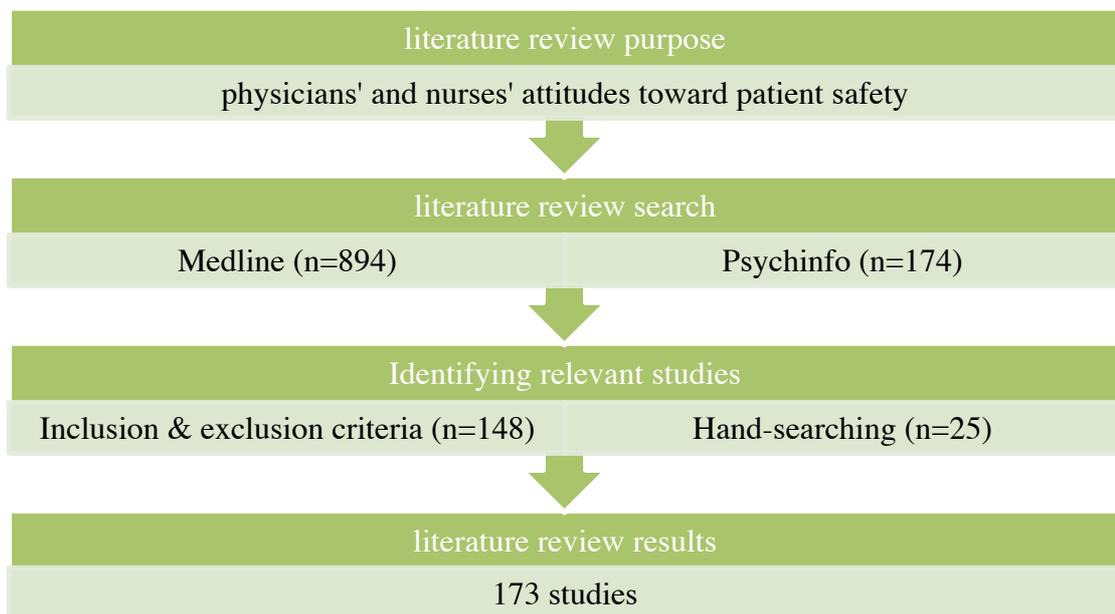


Figure 3.1: An overview of the review process

Of the 173 studies identified for review, 168 were empirical (10 targeting physicians, 26 targeting nurses, 25 targeting both, and 107 studies targeting different types of health care worker as well as or instead of physicians or nurses). Five were

review studies. Details about these studies in terms of author, country, study purpose, participants, instrument and key findings are provided in Appendix A. Most studies (n=76) were from the United States. Only eight studies from Saudi Arabia were identified (Aboshaiqah & Baker, 2013; Alahmadi, 2010; Al-Ahmadi, 2009; Alayed, Lööf, & Johansson, 2014; Almutairi, Gardner, & McCarthy, 2013; El-Jardali, Sheikh, Garcia, Jamal, & Abdo, 2014; Taher et al., 2014; Zakari, 2011); most of these had been conducted in academic hospitals, or public hospitals operated by the MOH. None had been conducted in Saudi Armed Forces hospitals.

In the following sections, the findings of the present review are reported under five main headings that are related to the research objectives addressed in this study: measuring patient safety attitudes; physicians' and nurses' attitudes toward patient safety; explaining differences in physicians' and nurses' attitudes; the relationship between physicians' and nurses' characteristics and their attitudes; and physicians' and nurses' attitudes toward patient safety initiatives.

3.3 Measuring Patient Safety Attitudes

In health care settings the methodology most widely used to measure health care workers' attitudes to issues related to safety is self-reported questionnaires, usually referred to as safety climate questionnaires. The findings from these provide a general picture of the current state of safety and provide an indicator of the underlying safety culture (Flin, 2007; Sexton, Helmreich, et al., 2006). In recent years a number of survey instruments have been developed to assess health care workers' attitudes toward patient safety. Some are publicly available and can be obtained from the published literature or websites. Several reviews of survey instruments that have been used to measure attitudes of health care workers' toward safety within health care settings have been conducted. In the next section the findings of these reviews are presented.

3.3.1 Previous literature reviews.

In the present review, five relevant literature reviews were identified (Colla, Bracken, Kinney, & Week, 2005; Flin, Burns, et al., 2006; Jackson, Sarac, & Flin, 2010; Robb & Seddon, 2010; Singla, Kitch, Weissman, & Campbell, 2006). Colla et al. (2005) identified nine instruments, mostly used to measure attitudes of health care workers toward various aspects of patient safety. These instruments were designed to

be used in different types of health care setting. All the instruments used a five-point Likert Scale. Colla et al. (2005) found that most of these instruments evaluated five common dimensions of patient safety: leadership, policies and procedures, staffing, communication, and reporting; the psychometric properties (i.e., aspects relating to validity and reliability) varied across these instruments. The most comprehensive and sound psychometric properties reported were for the Veterans Administration Patient Safety Culture Questionnaire (VHA PSCQ), the Hospital Transfusion Services Safety Culture Survey (HTSSCS), the Hospital Survey on Patient Safety Culture (HSOPSC) and the Safety Attitudes Questionnaire (SAQ) (Colla et al., 2005).

In another review, Singla et al. (2006) identified 13 instruments used to assess the safety climate in health settings by measuring health care workers' attitudes. These instruments evaluated a total of 23 individual patient safety dimensions. Singla et al. (2006) classified these into five broad categories: management/supervision, risk, work pressure, competence, rules, and miscellaneous. They found that these instruments varied in their content (the number of patient safety dimensions addressed), length, and patient safety dimensions covered. Of 13 instruments, nine were designed to target physicians, nurses, pharmacists, and health care workers in general. These instruments also varied considerably with regard to psychometric properties and analysis. The only two instruments that provided extensive comparative data that might be used for benchmarking safety climates between clinical units or hospitals were the SAQ and HSOPSC. These addressed core dimensions of safety including communication, teamwork, and leadership support (Singla et al., 2006).

In 2006 Flin, Burns, et al. (2006) reviewed twelve safety climate studies in health care. Their aim was to examine the psychometric properties of the questionnaires used in these studies. They found that nine used different safety climate instruments and three used different versions of the Operating Room Management Attitudes Questionnaire (ORMAQ). These instruments covered 73 safety climate dimensions, which Flin, Burns, et al. (2006) categorised into ten safety themes: management/supervisor, safety systems, risk perception, job demands, reporting/speaking up, safety attitudes/behaviours, communication/feedback, teamwork, personal resources (e.g. stress) and organisational factors. With regard to the psychometric properties of these instruments, Flin, Burns, et al. (2006) found that none had achieved full scale testing, and they noted that some instruments were at an

early stage of development. They concluded that the instrument that met most of the specified psychometric criteria was HSOPSC.

In a recent review, Robb and Seddon (2010) carried out a review to identify patient safety survey tools that were available and had good validity and reliability. They identified twelve instruments used to evaluate safety climate in health care settings; all have been reviewed in previous research (Colla et al., 2005; Flin, Burns, et al., 2006; Singla et al., 2006). Robb and Seddon (2010) indicated that these instruments showed considerable variation with respect to the dimensions of patient safety covered, the number of items and their psychometric properties. They recommended the SAQ and HSOPSC as tools that can be used to evaluate the safety climate of hospitals.

Jackson et al. (2010) examined recent studies that used staff surveys of hospital safety climate. They identified four questionnaires, HSOPSC, SAQ, Patient Safety Climate in Health Organisations (PSCHO), and Hospital Safety Climate Scale, used widely to evaluate the safety climate across different clinical areas and demonstrating acceptable psychometric properties. They also found that HSOPSC and SAQ had been used in previous studies to evaluate the effectiveness of patient safety interventions in health care settings.

3.3.2 Present review.

In the present review a number of safety climate instruments have been identified. These instruments are mainly used to measure health care workers' attitudes to various aspects of patient safety, for a number of reasons: to evaluate the safety climate in health care settings, to compare the safety climate between more than one health care setting or between settings in different countries, and to evaluate the impact of patient safety initiatives on health care workers' attitudes.

In the current review only 37 instruments have been included (see Appendix B). The remaining instruments used in other studies, which appear in Appendix A, have not been included as they are translated versions or are derived from a pre-existing instrument included in this review. For example, the SAQ—Operating room, SAQ—Ambulatory version, and other SAQ versions used in some studies are all modifications of the original SAQ (the SAQ-Intensive care unit version).

All the instruments reviewed in the present study are self-reported questionnaires using a Likert response scale. These instruments vary substantially

with regard to general characteristics, number of items, intended targeted population, dimensions of patient safety addressed, and validity and reliability of the instrument itself. The number of items included in these instruments varies. The shortest instrument is the Medical Event Reporting Attitude and Behaviour Questionnaire with five items, and the longest is the Medication Safety Self Assessment with 194 items. Of 37 instruments identified, 21 have been designed to target health care workers in general: physicians, nurses, and others. Sixteen have been designed for specific health care personnel. One instrument has several existing versions, all of which cover the core items of the original instrument.

The dimensions of patient safety covered in the instruments also vary, although most address certain dimensions that might be considered core elements for patient safety, such as leadership, communication, teamwork and reporting. These are included in the instruments on the basis of previous literature and an expert panel review.

Of 37 instruments identified in this review, the psychometric analyses (i.e., reliability and validity) of ten instruments have not been reported. The psychometric properties of the remaining instruments vary. Reliability analyses and exploratory factors analyses have been reported for most of the instruments. Different methods have been reported to test reliability such as test-retest reliability¹ and internal consistency.² Cronbach's alpha is reported as a key psychometric measure for most. Although a value of .70 or above is considered a good level of for internal consistency reliability (Bowling, 2011), a Cronbach's alpha of .60 and above is

¹ Test-retest reliability is used to test the stability of an instrument over a period of time by repeated administration to the same participants (Bowling, 2011). It is generally measured by a correlation coefficient, which it may vary from -1 to +1. A correlation coefficient value of +0.8 or above is considered to be a sound test-retest reliability for the instrument (Polgar & Thomas, 2008).

² Internal consistency is another common way to test reliability of instruments. It measures the degree to which all the items in a scale of instrument measure the same dimension (Bowling, 2011). Different methods such as multiple form, split half, item-item and item-correlations, and Cronbach's alpha, can be used to measure internal consistency (Bowling, 2011).

accepted in some studies as an indicator of acceptable reliability (Sorra & Nieva, 2004).

The information presented in Appendix A indicates that the two instruments used most widely are the SAQ and HSOPSC. Of the 173 studies included in this review, 46 utilised the SAQ and 26 the HSOPSC. The other instruments were used in a few studies, as presented in Appendix A.

3.3.2.1 Hospital survey on patient safety culture (HSOPSC).

HSOPSC was developed by a private research organisation under contract to AHRQ. The questionnaire items were derived from a review of existing safety literature and other available safety measurements, including the Medical Event Reporting System for Transfusion Medicine and the Veterans Health Administration Patient Safety Questionnaire (Sorra & Nieva, 2004).

HSOPSC was piloted using data in 1437 responses from health care workers in 21 US hospitals. The final instrument comprises 42 items covering ten dimensions of patient safety and two outcome dimensions. The survey uses a five-point Likert scale. Psychometric analysis indicates that HSOPSC has an acceptable internal consistency reliability to measure the safety climate in hospitals. Cronbach's alpha for the HSOPSC dimensions ranges from 0.63 to 0.83. Table 3.2 shows the HSOPSC dimensions, the number of items, and Cronbach's alpha coefficient for each.

Table 3.2: HSOPSC dimension, number of items and Cronbach's alpha coefficient

Dimension	No. of items	Cronbach's α coefficient
Supervisor/manager expectations & actions promoting safety	4	.74
Organisational learning—continuous improvement	3	.76
Teamwork within hospital units	4	.83
Communication openness	3	.72
Feedback and communication about error	3	.78
Non-punitive response to error	3	.79
Staffing	4	.63
Hospital management support for patient safety	3	.83
Teamwork across hospital units	4	.80
Hospital handoffs and transitions	4	.80
Overall perceptions of safety	4	.74
Frequency of event reporting	3	.84

HSOPSC has also been validated and used widely with or without modifications in different countries and has been translated into different languages (Bagnasco et al., 2011; Ballangrud, Hedelin, & Hall-Lord, 2012; Brborović, Šklebar, Brborović, Brumen, & Mustajbegović, 2014; Ghobashi, El-ragehy, & Mosleh, 2014; Hedsköld et al., 2013; Hellings, Schrooten, Klazinga, & Vleugels, 2007; Khater, Akhu-Zaheya, AL-Mahasneh, & Khater, 2015; Verbeek-Van Noord, Wagner, Van Dyck, Twisk, & De Bruijne, 2014).

3.3.2.2 Safety attitudes questionnaire (SAQ).

The SAQ is another safety climate questionnaire, designed to assess health care workers' attitudes regarding patient safety (Sexton, Helmreich, et al., 2006; Sexton, Thomas, & Grillo, 2003). It was developed by the University of Texas Centre of Excellence for Patient Safety Research and Practice (Sexton, Helmreich, et al., 2006; Sexton et al., 2003) and is a modified version of the Intensive Care Unit Management Attitudes Questionnaire (ICUMAQ), which was in turn derived from the Flight Management Attitudes Questionnaire (FMAQ). FMAQ is used widely in commercial aviation to elicit crew members' attitudes to aspects of performance such as teamwork, speaking up, leadership, communication and collaborative decisions (Sexton, Helmreich, et al., 2006).

The basic SAQ is a 64-item questionnaire. A number of different versions have been developed for use in different clinical areas, all containing 30 identical core items with only minor modifications to reflect the clinical area being assessed. These items assess health care workers' attitudes through six domains (teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management and working conditions) using a five-point Likert scale (Sexton, Helmreich, et al., 2006). The remaining 34 items explore additional aspects of safety. There is an open-ended question at the end, provided to gain some qualitative data on participants' views in regard to the top three recommendations for improving patient safety (Sexton, Helmreich, et al., 2006; Sexton et al., 2003).

The SAQ has been demonstrated to have good psychometric properties (Sexton, Helmreich, et al., 2006). Its validity and reliability have been evaluated in pilot testing and confirmatory factor analyses across 203 clinical areas in three countries (New Zealand, the United Kingdom and the United States) and over 10000 health care workers (Sexton, Helmreich, et al., 2006; Sexton et al., 2004).

Confirmatory factor analysis was used to evaluate the final model fit and supports it, including the 30 core items that measured six patient safety factors, as generally satisfactory (Sexton, Helmreich, et al., 2006). The coefficient alpha for the SAQ is .90, which indicates strong reliability (Sexton, Helmreich, et al., 2006). Table 3.3 shows the SAQ dimensions, number of items, and Cronbach's alpha coefficient for each subscale.

Table 3.3: SAQ domains, number of items, and Cronbach's alpha coefficient

Domains	No. of items	Cronbach's α coefficient *
Teamwork climate	6	.84
Safety climate	7	.84
Perceptions of management	4	.74
Job satisfaction	5	.93
Working conditions	4	.83
Stress recognition	4	.76

Note: * Sexton et al. (2004)

The validity and reliability of the SAQ have been further assessed in additional studies (Chaboyer et al., 2013; Huang et al., 2007; Modak, Sexton, Lux, Helmreich, & Thomas, 2007; Parry, Horowitz, & Goldmann, 2009). It has been widely used in different countries including Saudi Arabia (Alayed et al., 2014; Zakari, 2011), and has been translated into seven different languages including Arabic, Chinese, Dutch, German, Greek, Spanish, and Turkish (Abdou & Saber, 2011; Basuni & Bayoumi, 2015; Deilkas & Hofoss, 2008; Delgado Hurtado et al., 2012; Devriendt et al., 2012; Hamdan, 2013; Je et al., 2014; Kaya, Barsbay, & Karabulut, 2010; Lee et al., 2010; Poley, van der Starre, van den Bos, van Dijk, & Tibboel, 2011; Raftopoulos & Pavlakis, 2013; Raftopoulos, Savva, & Papadopoulou, 2011; Zimmermann et al., 2013). The findings from all these studies suggest that the SAQ is a valid and reliable instrument to elicit health care workers' attitudes toward six patient safety related domains: teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions.

3.4 Physicians' and Nurses' Attitudes Toward Patient Safety

Understanding health care workers' attitudes toward safety can help health care managers assess the safety climate and determine if health care organisations are

doing the right things to ensure safety and quality of care. A number of health care organisations including WHO, the National Patient Foundation, UK National Patient Safety Agency and the Agency for Health Care Research and Quality, have highlighted the need for organisations to measure health care workers' attitudes to patient safety (Hofoss & Deilkas, 2008).

A number of studies have been conducted to measure health care workers' attitudes to issues related to patient safety. As can be seen in Table 3.4, a wide range of patient safety dimensions has been identified in previous reviews (Colla et al., 2005; Flin, Burns, et al., 2006; Singla et al., 2006); nevertheless, there is no defining classification for these dimensions. This might be due to different terminology used by authors to classify patient safety and its scope. For instance, some researchers have defined teamwork broadly and include within it issues that other researchers have identified as a separate dimension called communication openness (Singla et al., 2006).

Table 3.4: Patient safety domains

Colla et al. (2005)	Singla et al. (2006)	Flin, Burns, et al. (2006)	Sexton, Helmreich, et al. (2006)
Leadership	Management/supervision	Management/supervisor	Teamwork climate
Policy and procedures	Risk	Safety systems	Safety climate
Staffing	Work pressure	Risk perception	Perceptions of management
Communication	Competence	Job demands	Stress recognitions
Reporting	Rules and miscellaneous	Reporting/speaking up	Job satisfaction
		Safety attitudes/behaviours	Working conditions
		Communication/feedback	
		Teamwork	
		Personal resources	
		Organisational factors	

As mentioned earlier, in a review of nine safety climate instruments Colla et al. (2005) reported that the most common patient safety dimensions included in these instruments were leadership, policies and procedures, staffing, communication and reporting. In another review, Singla et al. (2006) identified 23 patient safety dimensions addressed by 13 safety climate assessment tools. They grouped them into six broad categories: management/supervision, risk, work pressure, competence,

rules and miscellaneous. Flin, Burns, et al. (2006) identified 73 safety climate dimensions addressed in twelve studies, and categorised them into ten safety themes: management/supervisor, safety systems, risk perception, job demands, reporting/speaking up, safety attitudes/behaviours, communication/feedback, teamwork, personal resources (e.g. stress) and organisational factors.

Sexton, Helmreich, et al. (2006) developed a framework for measuring health care workers' attitudes toward issues relevant to patient safety in health care settings. They suggested that the attitudes of health care workers may be measured using six patient safety-related factors or domains: teamwork climate, safety climate, perceptions of management, stress recognition, job satisfaction and working conditions. Most patient safety dimensions identified in previous reviews (Colla et al., 2005; Flin, Burns, et al., 2006; Singla et al., 2006) can be covered by these six domains. Singla et al. (2006) have reported that the SAQ covers the most patient safety dimensions identified in their review (19/23); this framework will thus be used to discuss the findings of the current review in relation to physicians' and nurses' attitudes toward patient safety.

3.4.1 Safety climate domain.

The safety climate domain is defined as "perceptions of a strong and proactive organisational commitment to safety" (Sexton, Helmreich, et al., 2006), such as reporting and discussing errors, handling medical errors appropriately and learning from mistakes. In health care discussing errors is difficult, and not all workers accept personal liability for error (Sexton, Thomas, & Helmreich, 2000). Several barriers have been identified, including personal reputation, threat of malpractice suits, the high expectations of a patient's family or of society, possible disciplinary action, threats to job security, and the expectation or egos of other team members (Sexton et al., 2000). Coyle, Mercer, Murphy-Cullen, Schneider, and Hynan (2005) have cited a lack of time, extra paper work, and concerns about career and personal reputation as the major barriers to reporting medical events.

Several studies have focused on medication error reporting, highlighting the tendency of administrators to focus on the person rather than the system, the fear of adverse consequences such as manager and peer reactions, and disciplinary action as barriers to reporting medication errors (Mayo & Duncan, 2004; Potylycki et al., 2006; Stratton, Blegen, Pepper, & Vaughn, 2004). Hartnell, MacKinnon, Sketris, and

Fleming (2012) carried out a study in four community hospitals in Canada to identify barriers to medication error reporting. They identified several, including reporter burden (the extra time and work involved), professional identity (the fear of appearing incompetent to colleagues or patients), lack of information about the process in general, organisational factors (how things are done within the organisation as a result of reporting), and fear of reprisal or of exposure to malpractice suits. They found that health care workers were more willing to report medication error if reporting processes were easier, if they had received adequate education about reporting, and if there was timely feedback.

A growing body of research reports that physicians and nurses have discrepant attitudes toward safety climate. Several studies have indicated that nurses demonstrate more positive attitudes toward safety than physicians. For instance, Pronovost et al. (2003) found that nurses working at Johns Hopkins Hospital had more positive attitudes toward safety than physicians. They had more support from their supervisors to report safety concerns, were more aware of the proper channels through which to report adverse events, and were more aware that patient safety was a major initiative for their hospital. In another study, Grant, Donaldson, and Larsen (2006) found that inpatient nurses working in a children's hospital had more positive attitudes toward safety than other staff. The findings of Carayon, Hundt, Alvarado, Springman, and Ayoub (2006) also indicated that nurses had more positive attitudes to safety in outpatient surgery settings and were more likely than physicians to report patient safety issues. In a study carried out in 35 primary health centres in Egypt, Nabhan and Ahmed-Tawfik (2007) reported that physicians had less positive attitudes than nurses or the facilities' managers. In another Saudi Arabian study investigating safety climate in the dialysis unit, Taher et al. (2014) found that nurses rated safety climate more positively than physicians.

Other studies have reported different findings in regard to physicians' and nurses' attitudes toward safety. In a study conducted in ten Australian ICUs, Chaboyer et al. (2013) found that the safety climate was rated significantly more positively by physicians than by nurses. A previous study by Profit et al. (2012a) also found that, in twelve neonatal intensive care units (NICUs), physicians assessed safety-related norms more positively than nurses. In a Dutch paediatric surgical ICU, Poley et al. (2011) indicated that physicians had better attitudes toward safety than nurses. Speroff et al. (2010) found that among ICU personnel nurses gave the lowest

ratings for having a positive safety climate. Similarly, Huang et al. (2010) found that in 30 ICUs nurses gave lower safety climate scores than physicians. In emergency departments, Shaw et al. (2009) also found physicians' ratings for safety climate were more positive than nurses' ratings.

Despite the growing body of literature indicating that physicians and nurses have different attitudes to safety, some studies suggest that there are no differences and both profession groups have similar attitudes. The findings of Makary, Sexton, Freischlag, Millman, et al. (2006) have revealed no variation in safety attitudes among OR staff (surgeon, surgical technician, anaesthesiologist, certified registered nurse anaesthetist and OR nurse). Similarly, Modak et al. (2007) found that all health care staff working in an ambulatory practice had similar attitudes toward safety.

3.4.2 Teamwork climate domain.

Teamwork climate is "the perceived quality of collaboration between health care workers" (Sexton, Helmreich, et al., 2006). The critical importance of effective teamwork and communication in providing safe care has been discussed in previous research. In 2000 the IOM recommended "promoting effective team functioning" as one of the five principles to ensure safe health care (Kohn et al., 2000, p. 166). In 2014 JCAHO cited communication breakdown as the root cause of approximately 63% of all sentinel events reported to it in 2013 (Joint Commission on Accreditation of Healthcare Organisations, 2014). One of the barriers that hindered effective communication were the discrepant attitudes about teamwork among health care workers (O'Leary, Ritter, et al., 2010).

A growing body of research reports that physicians and nurses have different attitudes toward teamwork (Flin, Yule, McKenzie, Paterson-Brown, & Maran, 2006; Huang et al., 2010; Huang et al., 2007; O'Leary, Ritter, et al., 2010; Sexton, Holzmueller, et al., 2006; Sexton et al., 2000; Speroff et al., 2010; Thomas, Sexton, & Helmreich, 2003). Studies have revealed mixed findings about which group had the most favourable attitudes. Several studies carried out in different health care settings, such as the operating theatre (Carney, West, Neily, Mills, & Bagian, 2010; Grant et al., 2006), ICU (Chaboyer et al., 2013; France et al., 2010; Huang et al., 2010; Huang et al., 2007; Poley et al., 2011; Speroff et al., 2010), inpatients (Grant et al., 2006), NICU (Profit et al., 2012a), and labour and delivery unit (Sexton, Holzmueller, et al., 2006) have reported that physicians have more positive attitudes

toward teamwork than nurses. These findings are supported by other research showing that physicians often rated the quality of collaboration and communication they experienced with nurses higher than nurses rated their collaboration and communication with physicians (Carney, West, et al., 2010; Makary, Sexton, Freischlag, Holzmueller, et al., 2006; O'Leary, Ritter, et al., 2010; Poley et al., 2011; Relihan, Glynn, Daly, Silke, & Ryder, 2009; Sexton et al., 2000; Thomas et al., 2003).

Yet again there is a significant body of evidence showing variations in physicians' and nurses' attitudes toward teamwork: several studies found no variation existed between health care workers' attitudes toward teamwork, including physicians and nurses. For instance, Modak et al. (2007) reported that all outpatient staff working at an academic, urban, outpatient practice had similar attitudes toward teamwork. Similarly, Bodur and Filiz (2009) found no significant differences between primary health care staff's attitudes toward teamwork, whether within or across units. Nor do the findings of Holden, Watts, and Walker (2010) indicate any discrepancy between physicians' and nurses' attitudes toward the quality of collaboration and communication; they found no significant differences between primary care physicians and nurses. Holden et al. (2010) explained this finding as a result of the close association between physicians and nurses throughout the day, which may enhance relationships and promote interaction between them.

In general, several studies have reported that physicians and nurses have relatively positive attitudes toward teamwork (Baker, Amodeo, Krokos, Slonim, & Herrera, 2010; Flin, Fletcher, McGeorge, Sutherland, & Patey, 2003; Flin, Yule, et al., 2006; Itoh, Abe, & Andersen, 2002; Kaissi, Johnson, & Kirschbaum, 2003), and demonstrated positive attitudes to behaviours associated with effective teamwork such as team briefings and enjoying working as a part of a team (Flin, Yule, et al., 2006). Physicians and nurses also believed that integrated health care teams were established in health care settings to address patient safety issues, and that training was provided to enable staff to make safety-driven decisions (Pringle, Weber, Rice, Kirisci, & Sirio, 2009).

3.4.3 Perception of management domain.

The perception of management is related to staff approval of managerial actions such as decisions related to managerial support, staffing levels, and

equipment (Allen, Chiarella, & Homer, 2010; Sexton, Helmreich, et al., 2006; Sexton, et al., 2004). In health care settings, managers are responsible for ensuring safety patient outcomes. Their actions and behaviours establish the safety culture (Flin, Winter, Sarac, & Raduma, 2009). The relationship between perceptions of management and patient outcomes has been established in research (Huang et al., 2010). In a US multicentre study, Huang et al. (2010) found that higher hospital mortality was significantly associated with lower perceptions of management.

Variations in the attitudes toward management of physicians and nurses working in the same clinical unit have been also identified. Modak et al. (2007) found discrepant attitudes between outpatient physicians and nurses in an academic outpatient practice toward management, with physicians holding less favourable attitudes. Poley et al. (2011) found that nurses working at a Dutch paediatric surgical ICU consistently had a higher mean scale score for perceptions of management than physicians.

Despite the findings of these two studies, some other studies have reported different findings. In 2007 Huang et al. found that more physicians than nurses working in ICU had positive attitudes toward management; that nothing had changed three years later (Huang et al., 2010). Similarly, Speroff et al. (2010) found that nurses working in 67 ICUs had lower ratings to perceptions of management than physicians working in the same ICUs.

In general, physicians and nurses often demonstrated unfavourable attitudes toward perceptions of management. For instance, the findings of Grant et al. (2006) suggested that inpatient and OR staff in a children's hospital had less favourable perceptions of management support. Huang et al. (2007) found that less than a third of nurses and physicians working in ICU had positive perceptions of management. In a study carried out in Saudi Arabia, Zakari (2011) reported that a minority of nurses working in an academic ambulatory setting had positive perceptions of management. Profit et al. (2012a) found that the lowest positive attitudes among staff in twelve NICUs in the United States related to their perceptions of management. In a recent study carried in six ICUs in Saudi Arabia, Alayed et al. (2014) found that the perception of management earned the lowest scores from ICU nurses, compared with other safety domains.

3.4.4 Job satisfaction domain.

Job satisfaction describes the positivity of health care workers to their work experience (Sexton, Helmreich, et al., 2006). Several studies have discussed the influence of health care workers' job satisfaction on patient outcomes, indicating that nurses' dissatisfaction has been linked to poor patient outcomes (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). Huang et al. (2010) found that low job satisfaction among ICU staff was associated with patient outcomes such as longer lengths of stay.

Discrepancies between physicians' and nurses' attitudes toward job satisfaction have also been highlighted. Several studies indicate that nurses' job satisfaction in ICUs is lower than physicians' (France et al., 2010; Huang et al., 2010; Huang et al., 2007; Speroff et al., 2010). These findings are supported by a nationwide study by Chaboyer et al. (2013) of physicians and nurses in ten ICUs in Australia that found physicians had more positive attitudes toward job satisfaction than nurses. Despite a growing body of literature indicating a variation in physicians' and nurses' attitudes toward their experiences in ICUs, Modak et al. (2007) found that physicians and nurses who worked in an ambulatory setting had similar attitudes toward job satisfaction.

In general, several studies carried out in in different health care settings reported that physicians and nurses often demonstrated positive attitudes toward their work experiences. Grant et al. (2006) found that job satisfaction attitudes were high for inpatient and OR nurses and physicians. Patterson, Huang, Fairbanks, and Wang (2010) also found that the majority of emergency staff, including physicians and nurses, had positive attitudes toward job satisfaction. In a study carried out in Saudi Arabia to investigate nurses' attitudes toward patient safety, Zakari (2011) found that the majority of nurses working in four ambulatory units, medical, surgical, obstetrics/gynaecological and paediatric, had positive attitudes toward job satisfaction. Profit et al. (2012a) found that job satisfaction was the highest positive attitude among NICU staff. Raftopoulos and Pavlakis (2013) found that job satisfaction among ICU nurses scored the highest, at 83.4. In Saudi Arabia Alayed et al. (2014) also found that job satisfaction had the highest score (86.1) among ICU nurses.

3.4.5 Working conditions domain.

Working conditions refers to “the perceived quality of the work environment” (Sexton, Helmreich, et al., 2006), such as training, education and supervision of new personnel (Allen et al., 2010; Sexton, Helmreich, et al., 2006; Sexton, et al., 2004). In the literature, evidence suggests that physicians and nurses have discrepant attitudes toward working conditions. Chaboyer et al. (2013) found that physicians had more positive attitudes than nurses toward working conditions in ICUs. This supports the findings of previous work by Huang et al. (2007), Huang et al. (2010), France et al. (2010), and Speroff et al. (2010), that discrepant attitudes existed between physicians’ and nurses’ attitudes toward working conditions in ICUs, with more physicians demonstrating positive attitudes than nurses. In a study carried out in operating rooms at nine Veterans Health Administration medical centres in the United States, Carney, Mills, Bagian, and Weeks (2010) found that surgeons were significantly more likely to report favourable attitudes to working conditions.

Several studies have reported different findings in regard to physicians’ and nurses’ attitudes toward working conditions. For instance, Grant et al. (2006) found discrepant attitudes toward working conditions among inpatient and OR staff, including nurses and physicians, with nurses having the highest percentage of positive attitudes toward working conditions in a children’s hospital. In another study, Poley et al. (2011) found that nurses working in a paediatric surgical ICU in the Netherlands had more favourable attitudes toward working conditions than physicians. Despite the growing body of literature indicating a variation between physicians’ and nurses’ attitudes toward working conditions, Modak et al. (2007) found that all health care workers had similar attitudes.

3.4.6 Stress recognition domain.

Stress recognition refers to the extent to which health care workers recognise and acknowledge the influence of stressors such as fatigue on their performance (Sexton, Helmreich, et al., 2006). Several studies have indicated that health care workers are likely to deny the effect of stress and fatigue on their performance. Sexton et al. (2000) compared medical staff attitudes toward stress, error and teamwork with those of airline cockpit crews. Their findings indicated that OR and ICU staff were more likely than aviation staff to deny the effect of stress and fatigue. Similarly, Flin, Yule, et al. (2006) reported that theatre staff did not appreciate the

impact of psychological factors such as stress and fatigue on their performance. Grant et al. (2006) also found that stress recognition was low among inpatient and OR nurses and physicians. Modak et al. (2007) investigated patient safety attitudes among different types of health care staff working in an ambulatory setting. They found that less than half of all health care groups had positive stress recognition attitudes. Zakari (2011) found that only 29% of nurses working in academic ambulatory situations had positive attitudes toward stress recognition.

Recognition of the impact of stress and fatigue in performance varies between physicians and nurses (Grant et al., 2006; Huang et al., 2010; Itoh et al., 2002; Poley et al., 2011). Several studies have reported that nurses have low recognition of the effect of fatigue and stressful situations on their performance (France et al., 2010; Grant et al., 2006; Huang et al., 2010; Huang et al., 2007; Poley et al., 2011; Speroff et al., 2010). In recent study Gallego, Westbrook, Dunn, and Braithwaite (2012) compared the patient safety culture of different types of service across the health system in Australia. They found that among the professional group, physicians expressed relatively higher stress recognition attitudes. This finding, that nurses have low recognition of the effect of stressors on performance, differed from the findings of Itoh et al. (2002) and Modak et al. (2007), which indicated that nurses had more positive attitudes than physicians toward stress recognition.

3.5 Explaining Differences in Physicians' and Nurses' Attitudes Toward Patient Safety

Despite a growing body of literature indicating that physicians and nurses have discrepant attitudes toward patient safety, a few studies provide possible explanations. For instance, Grant et al. (2006) suggested that bedside care might be a reason why nurses have the most positive attitudes toward safety and working conditions. They have indicated that nurses provide most bedside care and are more aware of the degree to which patient safety is a priority.

In another study, Carayon et al. (2006) provided two possible explanations why differences exist between physicians and nurses on questions regarding patient safety. One explanation is the fact that nurses spent more time with patients and with the patients' families; thus, they might have a better recognition of patient safety problems. The other explanation is the varying level of organisational commitment. Carayon et al. (2006) indicated that nurses and other staff generally had more

commitment. Nurses have scheduled meetings to discuss organisational issues, unlike physicians who do not have time to discuss quality improvement or organisational processes. Nurses may thus be more aware than physicians of patient care issues, including patient safety.

Reasons for discrepancies between physicians' and nurses' attitudes toward teamwork are also provided in some studies. Thomas et al. (2003) reported that the reasons for discrepancy in physicians' and nurses' attitudes toward teamwork were not fully understood, and suggested that variation in nurses and physicians' status or authority, responsibilities, gender, training and nursing and medical culture might be contributory factors. Makary, Sexton, Freischlag, Holzmueller, et al. (2006) offered similar suggestions. Discrepant attitudes between physicians and nurses toward teamwork might be a result of how each group viewed effective teamwork. Nurses often described good collaboration as "having their input respected", whereas physicians tended to describe good collaboration as having nurses "who anticipate their needs and follow instructions" (Makary, Sexton, Freischlag, Holzmueller, et al., 2006, p. 748). Personal characteristics of health care workers might contribute to differences between physicians' and nurses' attitudes toward teamwork (Sexton, Holzmueller, et al., 2006).

3.6 Relationship Between Physicians' and Nurses' Characteristics and Their Attitudes

There is evidence to suggest associations between the attitudes of physicians and nurses toward patient safety and some of their demographic characteristics such as education, gender, age, and years of work experience. Pringle et al. (2009) have suggested that the age of health care workers affects their attitudes toward patient safety: for instance, younger participants were more likely to agree that hospital leadership made patient safety a priority than older participants. In another study, Carney, Mills, et al. (2010) reported that older staff in the operating room were more likely to have favourable attitudes to teamwork. Hamdan (2013) found that older physicians and nurses (over 30 years) working in NICUs had significantly higher responses for overall patient safety than their younger colleagues. Aboshaiqah and Baker (2013) found significant differences in nurses' scores for safety culture in the hospital based on their ages: nurses between 40 and 60 years of age gave more positive responses to patient safety than do those between 20 and 40. In another

study, Khater et al. (2015) found that older nurses who worked at hospitals had better responses for patient safety than younger nurses. Raftopoulos and Pavlakis (2013) found that older nurses working in ICUs had more positive attitudes to teamwork.

The influence of education on physicians' and nurses' attitudes to patient safety has been reported in some studies. Pringle et al. (2009) showed that variations in health care workers' attitudes to patient safety was affected by education: staff who had completed higher levels of education were more likely than those holding a high school diploma to agree that the leadership in their hospital made patient safety a priority, that a non-punitive culture for information sharing existed, and their hospital encouraged reporting adverse events. In another study, the findings of Haugen et al. (2010) also suggested that the level of education influenced health care workers' attitudes to patient safety. They found that health care workers with less education and the greatest distance from patients were most negative as to the patient safety climate in the operation room.

The impact of years of work experiences on physicians' and nurses' attitudes toward patient safety has been also identified in research. Several studies have shown a negative association between health care workers' attitudes to patient safety and their work experience. For instance, Bodur and Filiz (2009) found that health care workers who had been working more than ten years in their present unit displayed a significantly lower patient safety score. A similar significant negative association was found between patient safety score and work years in a study by Shaw et al. (2009). They found that nurses and physicians with less than three years' experience reported more positive safety climate scores than do those with more experience. Poley et al. (2011) also reported that the number of years staff had worked in ICU significantly influenced their attitudes toward stress recognition; as the number of years worked in this ICU increased, the level of stress recognition decreased.

Several studies also reported a positive association between health care workers' attitudes toward patient safety and their work experiences. Aboshaiqah and Baker (2013) reported a significant difference in nurses' responses about patient safety based on years of experience. They found that longer experience was associated with more positive responses for patient safety, suggesting that the more experienced nurses had a broader perspective and better understanding of the quality of patient care than those with less experience. Similarly, Ammouri, Tailakh, Muliira, Geethakrishnan, and Al Kindi (2015) and Khater et al. (2015) found that

nurses with more years of experience evaluated patient safety more positively than those with less experience. Raftopoulos and Pavlakis (2013) also found that nurses with more experience rated teamwork higher than less experienced nurses, and suggested that experienced nurses have had time to develop team building skills and professional competencies.

The influence of gender on attitudes toward patient safety is considered in some studies. Carney, Mills, et al. (2010) explored gender difference in operating room staffs' attitudes to patient safety. They found that women had less favourable attitudes to teamwork, job satisfaction, management, and working conditions. Carney, Mills, et al. (2010) also reported that men were significantly more likely to have favourable attitudes to job satisfaction and working conditions. Aboshaiqah and Baker (2013) found significant differences in nurses' responses to patient safety domains based on their gender: female nurses evaluated patient safety more positively than male nurses. Aboshaiqah and Baker (2013) have attributed this difference to culture itself, in that females are generally associated with caring behaviours.

The influences of other characteristics such as position, the size of the unit, working shifts, and language, on health care workers' attitudes toward patient safety have been reported. Kim, An, Kim, and Yoon (2007) found that head nurses had more positive attitudes toward safety at their working unit than staff nurses. Hamdan (2013) found that physicians and nurses working in a small NICU were more positive toward safety than their counterparts elsewhere. Hamdan suggested that in small NICUs staff familiarity with each other helped to foster teamwork and safety.

Aboshaiqah and Baker (2013) reported that nurses who worked day shifts evaluated their safety culture more positively than those working night or night/day shifts. They explained this as a result of nurses' involvement in patient safety activities and initiatives that normally occur during the day. In addition, nurses working day shift have more contact with managers, which may improve their awareness of the needs of patients. Aboshaiqah and Baker (2013) also found that language influenced nurses' attitudes toward patient safety. They find that non-Arabic speaking nurses working in a Saudi hospital evaluated patient safety more positively than Arabic nurses, and referred this finding to different educational systems, which may affect responses about patient safety positively or negatively.

3.7 Physicians' and Nurses' Attitudes Toward Patient Safety Initiatives

Several initiatives have been introduced to improve attitudes toward patient safety in health care settings, and the effectiveness of these has been investigated. Several studies have reported that patient safety initiatives such as training and educational programmes are effective interventions to improve health care workers' attitudes toward teamwork (Bleakley, Allard, & Hobbs, 2012; France et al., 2005; Grogan et al., 2004; Jones, Podila, & Powers, 2013; McCaffrey et al., 2012; Patterson, Geis, LeMaster, & Wears, 2013; Vertino, 2014), reporting incidents (Coyle et al., 2005; Jansma et al., 2010), safety climate (Sexton et al., 2011), and error analysis (Arora et al., 2012). In a recent study, the findings of AbuAlRub and Abu Alhijaa (2014) have suggested that patient safety initiatives such as educational interventions are effective in improving subcultures of patient safety such as "reporting" and "blame free" and in decreasing the rate of adverse events.

The effectiveness of other initiatives to improve patient safety, such as executive walk-rounds, structured inter-disciplinary rounds, morbidity and mortality conferences, and hand hygiene interventions have been investigated (Bechtold et al., 2007; di Martino et al., 2011; O'Leary, Wayne, et al., 2010; Thomas, Sexton, Neilands, Frankel, & Helmreich, 2005). Their findings suggest that these initiatives are also effective in improving health care workers' attitudes and, consequently, patient safety.

The successful implementation of patient safety improvement initiatives is influenced by health care workers' attitudes about these initiatives. Several studies have investigated health care workers' attitudes to such initiatives: for instance, health care workers' attitudes about crew resource management training have been assessed in a number of studies (France et al., 2005; Grogan et al., 2004; Haller et al., 2008; Hicks, Bandiera, & Denny, 2008; Sax et al., 2009). Overall, the findings indicate that health care workers who receive this type of training have positive attitudes toward it and its core principles such as effective communication, team leadership, resource utilisation, problem solving and situational awareness.

Studies have also investigated health care workers' attitudes to several patient safety initiatives such as patient involvement in patient safety-related behaviours (Davis, Sevdalis, & Vincent, 2012), protocols and guidelines (i.e., clinical protocol, WHO surgical safety checklist, JCAHO protocol for surgery) (Böhmer et al., 2012; Delgado Hurtado et al., 2012; Nilsson, Lindberget, Gupta, & Vegfors, 2010;

Rydenfält, Johansson, Odenrick, Åkerman, & Larsson, 2013; Uddin, Marsteller, Sexton, Will, & Fox, 2012) and preoperative briefing (Ali, Osborne, Bethune, & Pullyblank, 2011; Allard, Bleakley, Hobbs, & Coombes, 2011; Gore et al., 2010). The findings of these studies also indicate that health care workers have positive attitudes toward these interventions.

Despite this general finding, a discrepancy between physicians' and nurses' attitudes is highlighted in some of this research. Nilsson et al. (2010) evaluated the attitudes of OR staff toward the JCAHO surgical checklist "time out" and WHO checklist "sign-out" in the OR. They found discrepant attitudes between nurses and surgeons about the importance of three elements included in "time out": checking patient positioning, checking allergies, and reviewing potential critical moments. Nurses rated the importance of these aspects higher than surgeons. They also rated the importance of checking the procedure that had been performed and checking equipment included in the "sign out" checklist, higher than did surgeons.

Physicians' and nurses' attitudes toward the WHO surgical safety checklist were the subject of a study by Delgado Hurtado et al. (2012), who investigated the acceptance of, and attitudes toward, the WHO checklist among surgical personnel in Guatemala. Their findings indicated that more nurses than surgery residents were aware that the checklist had to be used at three time points: before the induction of anaesthesia, before skin incision, and before the patient leaves the operating room.

In another study, Uddin et al. (2012) compared health care workers' attitudes toward the use of protocols in medical care and the use of the Johns Hopkins Oxytocin Protocol (JHOP) in obstetrics. Their findings indicated that the use of clinical protocol was well received by obstetrical staff, but differences existed in attitudes toward the use of JHOP, with physicians having significantly more negative views of the JHOP as evidence-based than nurses. Uddin et al. (2012) explained this difference by indicating that the strength of the evidence underlying a particular protocol may have more importance for physicians. In addition, physicians may view protocols as barriers to their autonomy, while nurses may see them as an empowering factor that makes them more independent and enables them to become involved in clinical decision-making.

Variation between physicians and nurses is also evident in their attitudes toward patient involvement in safety-related behaviours. Davis et al. (2012) investigated physicians' and nurses' attitudes toward patient involvement in safety-

related behaviours, both through their eyes as health care professionals and as potential patients. They found that although nurses were more willing than physicians to support patients' involvement and to participate in safety behaviours as patients, both professions held positive attitudes toward patient involvement.

3.8 Summary

Exploring physicians' and nurses' attitudes toward patient safety is essential if improvements are to be made. A number of instruments have been designed to assess health care workers' attitudes toward issues relevant to patient safety, including those of physicians and nurses. Many instruments are publicly available and easily accessed in literature or online. They vary considerably, not only in their general characteristics, number of questions, and the patient safety dimensions covered, but also in their reliability and validity.

To select an appropriate instrument, a researcher should take into consideration several issues such as the purpose of a study, the study sample, and the psychometric proprieties of the instrument. Colla et al. (2005) has recommended that users of these instruments "should prefer instrument that have been shown to be reliable by comprehensive and sound psychometric testing" (p. 365), depending on the purpose of the study. Singla et al. (2006) have noted that selecting an appropriate instrument depends on the study purpose, the target population, and the validity and reliability of the instrument.

In the present review, the most widely used instruments are HSOPSC and SAQ. These are most often recommended for use in health care settings and show good psychometric proprieties to explore health care workers' attitudes toward patient safety, compared with other safety climate instruments (Colla et al., 2005; Robb & Seddon, 2010). The patient safety dimensions they cover differ: SAQ covers 19 out of 23 of those identified by Singla et al. (2006), whereas HSOPSC covers only 14.

A growing body of literature explores physicians' and nurses' attitudes toward patient safety. Most are based in the United States and only a few have been conducted in Saudi Arabia, but all show that physicians and nurses have discrepant attitudes toward patient safety, and toward patient safety initiatives. The studies have identified mixed results in terms of which of these two professional groups have the most favourable attitudes. Why differences exist is not fully understood, although a

few studies have provided possible explanations, and further studies need to be undertaken to investigate why they do.

Gaps are evident in the Saudi literature related to physicians' and nurses' attitudes toward patient safety, particularly in the Saudi Armed Forces hospitals, and these will be addressed in this study. This will add to the growing body of literature regarding physicians' and nurses' attitudes toward patient safety as well as help to explain why discrepancies exist.

In the next chapter, the methodology of this study will be discussed.

Chapter 4: Methodology

4.1 Introduction

This research is designed to investigate physicians' and nurses' attitudes toward patient safety in the Saudi Armed Forces hospitals in the eastern region. The previous three chapters introduced the background, the Saudi context, and the literature related to the study problem. This chapter details the research design adopted for this study, the setting of the research and the targeted population. At the end of this chapter, ethical issues are explored.

4.2 Research Design

In this study a mixed methods research approach was used to explore physicians' and nurses' attitudes toward patient safety in Saudi Armed Forces hospitals in the eastern region. The use of mixed methods research in social and behavioural sciences is well established, and has been used to investigate various social phenomena since the 1960s (Collins, Onwuegbuzie, & Jiao, 2007). It has been described as "one of the three major research paradigms (quantitative research, qualitative research, and mixed methods research)" (Johnson, Onwuegbuzie, & Turner, 2007, p. 112). It is a mixture of quantitative and qualitative approaches. Ivankova, Creswell, and Stick (2006) have described mixed methods design as "a procedure for collecting, analysing, and mixing or integrating both quantitative and qualitative data at some stage of the research process with a single study for the purpose of gaining a better understanding of the research problem" (p. 3).

There are a number of mixed methods research designs (Creswell & Clark, 2011). In the current study, the sequential explanatory mixed methods design is used for addressing the research problem; this is the most popular mixed methods design used in research (Ivankova et al., 2006). It consists of two interactive phases: the first involves the collection and analysis of quantitative data; the second, the collection of qualitative data. The collection of qualitative data is informed by specific findings of the first phase (Creswell & Clark, 2011).

The rationale for using the sequential explanatory mixed methods design is that the quantitative data and analysis of the first phase may not always be sufficient to provide a complete understanding of the research problem. It provides a general understanding of physicians' and nurses' attitudes toward patient safety, but the

collection and analysis of qualitative data is needed to refine and explain the quantitative results by exploring physicians' and nurses' attitudes in more depth. Ivankova et al. (2006) have indicated the rationale behind this approach is that "the quantitative data and their subsequent analysis provide a general understanding of the research problem. The qualitative data and their analysis refine and explain those statistical results by exploring participants' view in more depth" (p. 5). The combination of quantitative and qualitative methods enables researchers to produce a more comprehensive analysis and broaden their understanding of the research topic (Ivankova et al., 2006). Moreover, it provides researchers with the flexibility to use all available data collection methods rather than being restricted to one type (Creswell & Clark, 2011).

The visual diagram of the sequential explanatory mixed methods design of this study is presented in Figure 4.1. In this study, the quantitative data were collected first by using a validated self-administration questionnaire. The results of the quantitative phase, phase one, were then used as a framework to design and conduct the qualitative phase, phase two, in which qualitative data were collected and analysed to understand inferences drawn from the first phase. The two phases of the study were connected at the beginning of phase two while the interview questions were being developed and the interview participants selected. They were also connected at the final step, the discussion of the findings of the entire study and of how the findings of the second phase helped to explain the findings of the first phase in greater depth. Details about the methods used in the quantitative and qualitative phases are presented in Chapters 5 and 7.

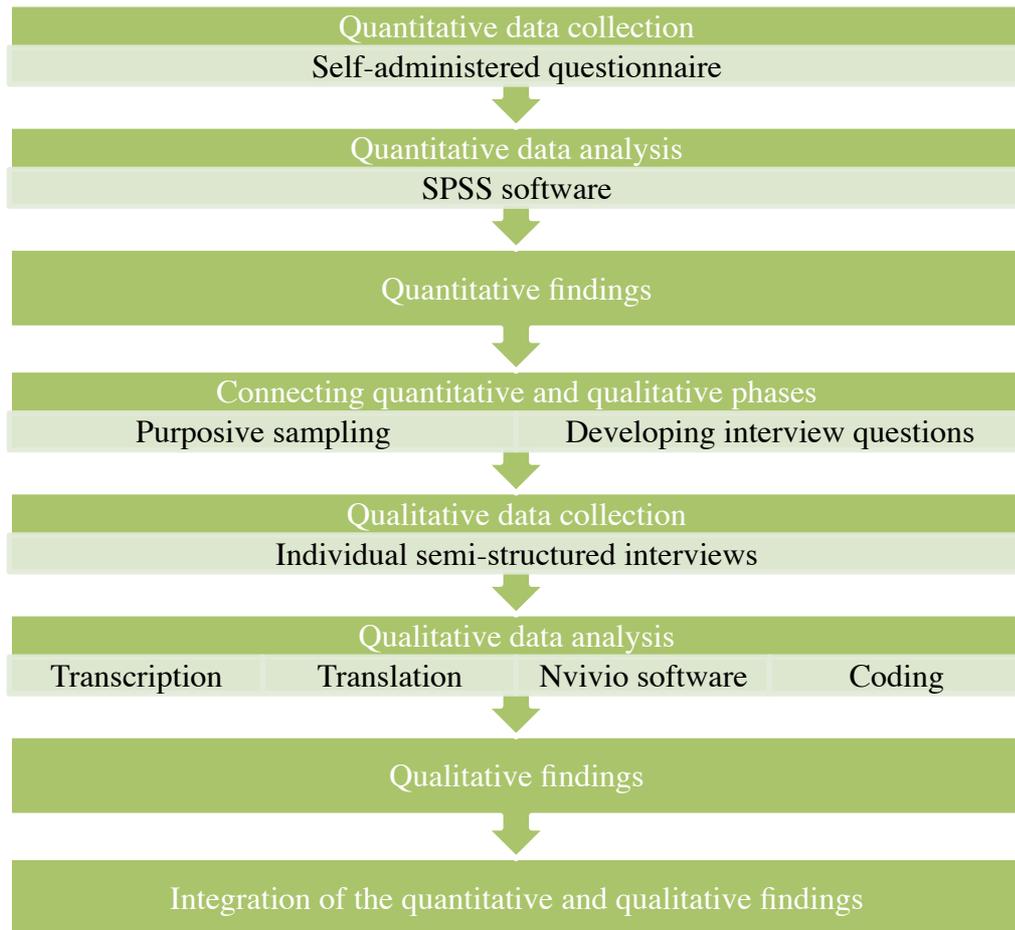


Figure 4.1: Visual model for the study design

4.3 Setting and Target Population

The current study was carried out at three Armed Forces hospitals located in the eastern region of Saudi Arabia. The hospitals chosen were King Fahd Medical Complex in Dhahran, considered one of the most modern medical institutions among the Saudi Armed Forces hospitals with a capacity of 350 beds, the Saudi Armed Forces hospital in Dhahran with a capacity of 230 beds, and the Saudi Armed Forces hospital in Jubail with a capacity of 145 beds (Medical Services Department, 2009a). These study sites were selected for two reasons:

1. The researcher's ability to gain access to the study sites and the expectation that permission could be obtained from the main stakeholders in the MSD and the study sites along with support to conduct the study.
2. The close proximity of the study sites offered the opportunity of conducting the study in more than one hospital within the available timeframe.

The target population in this study were physicians and nurses working in the study sites. Details about recruitment are provided in Chapters 5 and 7.

4.4 Research Permission and Ethical Considerations

Ethical approval was granted by the Human Research Ethics Committee at Curtin University (Appendix C). MSD permission was obtained to conduct this study in Saudi Armed Forces hospitals in the eastern region of Saudi Arabia (Appendix D).

A number of ethical issues were considered, including participants' consent, privacy and data storage, cultural sensitivity and gender. All participants were provided with written information about the study, including its purpose, and were given contact details for the researcher, the study supervisor and the Human Research Ethics Committee at Curtin University (Appendix E). All individuals who participated were asked to provide written informed consent prior to participating (see Appendix F for quantitative sample and Appendix G for qualitative sample). Participants were advised that participation in the study was voluntary, that they had the right to ask questions, and could choose to withdraw from the study at any time without consequences or explanations.

Participants' privacy and anonymity were assured at all times. Personal data were de-identified and all information was kept anonymous. The data were stored securely at Curtin University to ensure the confidentiality and privacy of participants. The researcher and his supervisors were the only persons permitted to access the data. Electronic files were saved on a password-protected computer at Curtin University. The data will be maintained for five years, and will then be destroyed in accordance with university policy. All digitally recorded files will be erased when the study is completed.

Throughout the study, the researcher was mindful of the necessity for cultural sensitivity. Although ethnicity is not considered a sensitive issue in Saudi Arabian hospitals, any impact from the researcher's and participants' differing cultural background on the data collection process was minimised, particularly in phase two. To achieve this, throughout the interviews the researcher listened respectfully to all participants and showed respect for their cultural backgrounds and beliefs. Regardless of their cultural background, participants were provided with the same environment when sharing their experiences and knowledge.

The influence of gender differences between the researcher and participants was also considered, particularly in the second phase. The researcher was aware that his gender might have an influence on some participants' willingness to participate in interviews. In Saudi culture it can be problematic for male researchers to interview female participants, and it was anticipated that some nurses (who tend to be mainly females) might be reluctant to participate, a problem not anticipated in interviewing the physicians, who were mainly male. To minimise the influence of gender differences between the researcher and participants, and the problematic issue of interviewing females, all interviews were conducted with the permission of the study sites' authorities. All participants, regardless of gender, were provided with the same opportunity to share their experiences, knowledge and feelings.

4.5 Summary

This chapter described the sequential explanatory mixed methods design used in this study to explore physicians' and nurses' attitudes toward patient safety. It also described the research setting and target population before concluding with a discussion of several ethical issues that were considered before the study was commenced. Quantitative and qualitative methods used in the present study will be discussed in further detail in the following chapters.

Chapter 5: Quantitative Phase Method

5.1 Introduction

This chapter describes the quantitative phase method denoted as phase one. In this phase, quantitative data were collected through a valid self-administered questionnaire designed to explore health care workers' attitudes toward various aspects of patient safety. The research sample of qualitative data, data collection and analysis methods are presented here; the findings appear in Chapter 6.

5.2 Quantitative Sample

The sample of the quantitative phase was all the study's targeted population. It consisted of all physicians and nurses working in Armed Forces hospitals in the eastern region of Saudi Arabia. A total of 1429 physicians and nurses working in the study sites during the time of data collection were invited to participate. Table 5.1 presents the numbers of physicians and nurses working in the study sites at the time of the survey.

Table 5.1: Physicians and nurses working in the study sites

Site	Physicians		Nurses		Total	
	N	%	N	%	N	%
King Fahd Medical Complex, Dhahran	191	45.4	398	39.5	589	41.2
The Saudi Armed Forces hospital, Dhahran	154	36.6	380	37.7	534	37.4
The Saudi Armed Forces hospital, Jubail	76	18.0	230	22.8	306	21.4
Total	421	100	1008	100	1429	100

Source: hospital administration, medical, and nursing departments.

5.3 Exclusion criteria

Physicians and nurses who had less than six months' work experience were excluded. This criterion was applied to ensure that all participants had been exposed to safety culture within their hospitals.

5.4 Data Collection Tool

As explained in Chapter 3, the most appropriate surveys for assessing health care workers' attitudes toward patient safety are the SAQ and HSOPSC. For the

purpose of this study, the original version of SAQ (SAQ-ICU) was used for the following reasons:

1. The SAQ has shown good psychometric properties and can be used to survey health care workers' attitudes across six patient safety related domains: teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions (Sexton, Helmreich, et al., 2006).
2. The SAQ is the most widely used, valid, and reliable tool for assessing workers' attitudes toward patient safety in health care organisations (Deilkas & Hofoss, 2008; Pronovost & Sexton, 2005). It has been adopted for use in a variety of clinical areas (Sexton, Helmreich, et al., 2006).
3. The SAQ has been used to compare the patient safety climates of different health care organisations (Watts, Percarpio, West, & Mills, 2010). More than 1300 hospitals worldwide, including Germany, Italy, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States have used SAQ as an instrument for measuring and improving patient safety (Deilkas & Hofoss, 2008). The administration of this instrument in different hospitals worldwide offers a wealth of comparative data for health care organisations to benchmark their patient safety climate.
4. Clear guidelines are available for using the SAQ as a measurement tool, including procedures for administration and data analysis (Sexton et al., 2003).

5.5 Data Collection Procedure

In phase one of this study, three steps were used in the data collection: obtaining access to the study sites, administration of the SAQ, and follow-up.

5.5.1 Access to study sites.

The first step was gaining access to the study sites. Although an approval letter was issued from the MSD to facilitate this study, it was necessary that the researcher met with the hospital director of each site. The researcher also met heads of the training, medical and nursing departments in each site to explain the purpose of this study and its significance, and to seek their support in facilitating data collection in their hospitals.

5.5.2 Administration of the SAQ.

Prior to administering the questionnaire, permission from Professor Eric J Thomas, the Director of the University of Texas Houston Memorial Hermann Centre for Health Care Quality and Safety, was obtained to modify the original version of the SAQ (Appendix H). The item content remained the same, but minor modifications were made with regard to demographic questions, and the words “clinical area” were used instead of “ICU”. This modification was made to contextualise the SAQ to the study setting, and was similar to previous modifications applied to other validated versions (Sexton, Helmreich, et al., 2006). For example, “Nurse input is well received *in this ICU*” was replaced with “Nurse input is well received *in this clinical area*”. English is commonly used in the study sites, and so the questionnaire was administered in English, its original language.

The SAQ (Appendix I) was administered in cooperation with the training department, and the medical and nursing departments, in each hospital. Each hospital assigned a number of questionnaires corresponding to the number of physicians and nurses working in the hospital at the time of the survey, including the information letter and consent form (Appendixes E and F). Participants were asked to return the completed questionnaires and signed consent forms in a sealed envelope within two weeks to their department, at which time they were collected by the researcher. Other completed questionnaires were personally returned to the researcher.

5.5.3 Follow-up.

The final step was to follow up with each department in each hospital. After the SAQ was distributed the researcher contacted the departments twice, at intervals of two and four weeks, to ascertain if any more SAQs had been completed.

5.6 Quantitative Data Analysis

The purpose of phase one was to use a valid and reliable questionnaire to elicit physicians’ and nurses’ attitudes toward patient safety. No preliminary testing of the reliability and validity of the SAQ was undertaken in this study, as a significant body of evidence has indicated that the SAQ is a valid and reliable tool that can be used to assess health care workers’ attitudes toward patient safety in different health care settings.

Quantitative analysis was conducted using SPSS. Detailed descriptive statistics, including frequency, mean, and standards deviation, were used to describe

the characteristics of the quantitative phase sample. The statistical analyses of the six patient safety domains were calculated as recommended by the original authors of the SAQ (University of Texas: Centre for Health Care Quality & Safety, n.d.). First, the two negatively worded items in the SAQ were reverse scored. Each item was measured on a 5-point Likert scale (1=disagree strongly, 2=disagree slightly, 3=neutral, 4=agree slightly, 5=agree strongly). The mean score for each domain was calculated and converted to a 100-point scale. To calculate the 100-point scale score for an individual respondent, the following equation was used: $(100\text{pt scale} = (\text{mean of the scale} - 1) * 25)$. The percentage of participants with positive attitudes was calculated by identifying the proportion of participants with a score of 75 or higher for each domain.

To conduct a comparison between physicians' and nurses' attitudes toward patient safety domains, the Chi-square test was utilised; when this proved inadequate (i.e., if the minimum expected frequency was less than five) (Munro, 2005), Fisher's Exact test was used. The same method was used to test associations between participants' attitudes toward patient safety domains and their demographic information, such as clinical area, job category, years of work experience, level of education and nationality. To perform Chi-square analysis, some of the categorical variables were re-categorised to provide fewer categories with more cases (Munro, 2005). *P* values of 0.05 and lower were considered significant. To determine the strength of association between participants' attitudes and their demographic characteristics, Phi co-efficient and Cramer's *V* was performed.

Open-ended questions regarding participants' recommendations for improving patient safety were analysed using inductive thematic content analysis. This form of analysis is data driven, so that codes are generated without categorising the data using an existing framework (Braun & Clarke, 2006). This method enables researchers to identify themes without making assumptions about what will emerge from the data (Patton, 2002). In the present study, inductive thematic analysis was conducted using the qualitative data analysis software QSR NVivo 8.

5.7 Summary

This chapter described the procedures for data collection and analysis in phase one. In this phase, quantitative data were collected through the SAQ. Following data collection, detailed descriptive statistics were used to describe the characteristics of

the quantitative phase sample. The statistical analyses of the six patient safety domains were calculated as recommended by the original authors of the SAQ. The Chi-square test and, when this was inadequate, Fisher's Exact test were used to compare physicians' and nurses' attitudes toward patient safety domains. These two analyses were also used to identify and evaluate associations between participants' attitudes and their demographic information. In the next chapter, the quantitative results of phase one will be presented. Topics of interest will be identified which will inform phase two of this study.

Chapter 6: Quantitative Phase Results

6.1 Introduction

The purpose of the quantitative phase was to explore physicians' and nurses' attitudes toward six patient safety domains. This chapter presents the results of the SAQ, detailing the response rate, providing a descriptive overview of the study sample, and exploring the results. It also presents a summary of participants' responses to the open-ended question.

6.2 Response Rate

The quantitative data were collected over a period of two months, between October and November 2011. A total of 1429 questionnaires were distributed to all physicians and nurses working in the study sites at the time of the SAQ administration, 421 physicians and 1008 nurses. Of these, 765 surveys were returned (53.6%); 118 were excluded as participants failed to provide sufficient background information and seven were excluded because the participants had less than six months' work experience. The final analyses of this study were limited to 640 surveys with an overall response rate of (45%) (Table 6.1).

Table 6.1: Response rate of participants by hospital and profession

Hospital (N)*	Physicians (421)	Nurses (1008)	Overall (1429)	Responses (%)
KFMC (589)	43	219	262	44.5
AFHD (534)	44	148	192	36.0
AFHJ (306)	30	156	186	60.8
Total (1429)	117	523	640	45.0

*Note.** Number of physicians and nurses working in the study site, KFMC = King Fahd Medical Complex, AFHD = Armed Forces hospital in Dhahran, AFHJ = Armed Forces hospital in Jubail.

6.3 Demographic Data

Demographic data included profession, gender, age group, nationality, job category, level of education, years of experience in specialty, years of work experience and clinical area.

6.3.1 Profession.

Table 6.2 shows the number of participants according to profession. The majority of the sample (81.7%) were nurses; the rest were physicians.

Table 6.2: Participants' profession

Profession	Participants (N)	Participants (%)
Physician	117	18.3
Nurse	523	81.7
Total	640	100.0

6.3.2 Gender.

Table 6.3 shows that 79.4% of the study sample were female. Of the 523 nurses who participated in this study, only 6.7% were male. The majority of physicians were male.

Table 6.3: Participants' gender

Gender	Physicians		Nurses		Overall	
	N	%	N	%	N	%
Male	97	82.9	35	6.7	132	20.6
Female	20	17.1	488	93.3	508	79.4
Total	117	100.0	523	100.0	640	100.0

6.3.3 Age group.

The descriptive statistics indicated that 40.2% of nurses were <30 years of age, with the next largest group aged between 30 and 39. Only 11.5% of nurses were aged 50 or over. In comparison, most physicians were between 30 and 39 years of age, and 35% between 40 and 49. Only 7.7% were under 30 years old. Table 6.4 summarises the age groups of participants.

Table 6.4: Participants' age groups

Age Group	Physicians		Nurses		Overall	
	N	%	N	%	N	%
< 30	9	7.7	210	40.2	219	34.2
30-39	42	35.9	172	32.9	214	33.4
40-49	41	35.0	81	15.5	122	19.1
≥ 50	25	21.4	60	11.5	85	13.3
Total	117	100.0	523	100.0	640	100.0

6.3.4 Nationality.

Table 6.5 shows that the majority of participants were non-Saudi: 97% of nurses and 66% of physicians.

Table 6.5: Participants categorised by nationality (Saudi/Non-Saudi)

Nationality	Physicians		Nurses		Overall	
	N	%	N	%	N	%
Saudi	40	34.2	16	3.1	56	8.8
Non-Saudi	77	65.8	507	96.9	584	91.3
Total	117	100.0	523	100.0	640	100.0

The percentage of participants was further classified according to nationality, as shown in Table 6.6. Most of the participating physicians were Saudis and Egyptians: 34.2% and 30.8% respectively. The remaining physicians were from countries such as Pakistan, Sudan, Syria, Jordan, India and the United Kingdom. In contrast, nurses were mainly Filipino (47.2%) and Indian (37.3%). Only 8.2% were Malaysian, and 2.1% were South African. The majority of nurses came from different cultural backgrounds, in contrast to the physicians who came from Muslim and Arabic countries that have similar cultural background.

Table 6.6: Participants categorised by nationality

Nationality	Physicians		Nurses		Overall	
	N	%	N	%	N	%
Syrian	7	6.0	-	-	7	1.1
Jordanian	6	5.1	3	.6	9	1.4
Egyptian	36	30.8	2	.4	38	5.9
Sudanese	8	6.8	-	-	8	1.3
Pakistani	9	7.7	3	.6	12	1.9
Indian	4	3.4	195	37.3	199	31.1
Filipino	1	.9	247	47.2	248	38.8
Spanish	1	.9	-	-	1	.2
British	3	2.6	-	-	3	.5
South African	-	-	11	2.1	11	1.7
Malaysian	-	-	43	8.2	43	6.7
Romanian	-	-	1	.2	1	.2
Indonesian	-	-	2	.4	2	.3
Irish	1	.9	-	-	1	.2
American	1	.9	-	-	1	.2
Saudi	40	34.2	16	3.1	56	8.8
Total	117	100.0	523	100.0	640	100.0

6.3.5 Job category.

Table 6.7 shows the distribution of participants according to job category. The study sample comprised 6.7% consultant physicians, 7.8% specialists (registrar physicians), 3.8% resident physicians, 7.5% head nurses (charge nurses), 0.3% nurse consultants, 59% specialist nurses (registered nurses), and 14.5% nurse technicians. The largest group of physicians who participated were specialists (registrar physicians) with a percentage of 42.7%, while specialist nurses (registered nurses) comprised the largest group of nurse participants, with a percentage of 72.7%.

Table 6.7: Participants' job category

Job Category	Physician		Nurse		Overall	
	N	%	N	%	N	%
Physician						
Consultant Physician	43	36.8	-	-	43	6.7
Specialist/ Registrar Physician	50	42.7	-	-	50	7.8
Resident Physician	24	20.5	-	-	24	3.8
Nurse						
Head Nurse/ Charge Nurse	-	-	48	9.2	48	7.5
Nurse Consultant	-	-	2	.4	2	.3
Specialist Nurse/ Registered Nurse	-	-	380	72.7	380	59.4
Nurse Technician	-	-	93	17.8	93	14.5
Total	117	100.0	523	100.0	640	100.0

6.3.6 Level of education.

Table 6.8 describes the study sample according to level of education. Of 523 nurses who completed the survey, 52.0% indicated a diploma as their highest educational qualification, and 46.5% reported they had a Bachelor's degree. Two nurses (0.4%) had a Master's degree. Of the physicians, 41.0% reported that they had a PhD, 23.9% held a Master's, and 12% had completed a postgraduate diploma. Only 23.1% of physicians indicated Bachelor's degrees as their highest level of education. In Saudi Arabia opportunities to obtain high educational qualifications are unlimited for Saudi physicians, and the government often recruits expatriate physicians with much experience and high levels of education; thus, it was expected that many physicians in the study would hold PhD degrees.

Table 6.8: Participants' level of education

Level of education	Physicians		Nurses		Overall	
	N	%	N	%	N	%
Diploma	-	-	272	52.0	272	42.9
Bachelor	27	23.1	243	46.5	270	42.2
Postgrad. Diploma	14	12.0	6	1.1	20	3.1
Master	28	23.9	2	0.4	30	4.7
PhD	48	41.0	-	-	48	7.5
Total	117	100.0	523	100.0	640	100.0

6.3.7 Years of experience in specialty.

Participants' years of experience in their specialty varied (Table 6.9). The demographic data revealed that 41.3% of participants had between three and seven years of experience in their specialty: 25.6% of physicians and 44.7% of nurses. Only 1.6% of the sample reported that they had less than six months' experience in their specialty.

Table 6.9: Participants' years of experience in specialty

Years of experience in specialty	Physicians		Nurses		Overall	
	N	%	N	%	N	%
< 6 Months	1	0.9	9	1.7	10	1.6
6 Months – 2 Years	5	4.3	88	16.8	93	14.5
3 – 7 Years	30	25.6	234	44.7	264	41.3
8 – 12 Years	31	26.5	99	18.9	130	20.3
13 – 20 Years	24	20.5	52	9.9	76	11.9
≥ 21 Years	26	22.2	41	7.8	67	10.5
Total	117	100.0	523	100.0	640	100.0

6.3.8 Years of work experience.

Table 6.10 shows the responses of participants in regard to years of experience. Overall, 40.3% indicated experience of between three and seven years. Physicians with between 13 and 20 years were the largest group of physicians, with a percentage of 30.8%. In contrast, the largest group of nurses had experience of between three and seven years, at 45.9%. Only 4.3% of physicians and 6.7% of nurses had between six months and two years of work experience.

Table 6.10: Participants' years of work experience

Years of work experience	Physicians		Nurses		Overall	
	N	%	N	%	N	%
6 Months – 2 Years	5	4.3	35	6.7	40	6.3
3 – 7 Years	18	15.4	240	45.9	258	40.3
8 – 12 Years	27	23.1	95	18.2	122	19.1
13 – 20 Years	36	30.8	90	17.2	126	19.7
≥ 21 Years	31	26.5	63	12.0	94	14.7
Total	117	100.0	523	100.0	640	100.0

6.3.9 Clinical area.

The largest group of physicians worked in the emergency department (16.2%), followed by those in family medicine (12.8%). Only 0.9% of physicians were working in preventative medicine. Twelve per cent reported they worked in other areas, and 1.7% that they worked in multiple areas. The largest group of nurses worked in ICUs (20.3%), followed by those in family medicine (9.4%). Only 0.2% of nurses worked in radiology. Twenty-four per cent of nurses indicated they worked in other areas, and 8.4% indicated they were working in multiple areas (Table 6.11).

Table 6.11: Participants' clinical area

Clinical Area	Physicians		Nurses		Overall	
	N	%	N	%	N	%
Dental	14	12.0	6	1.1	20	3.1
Emergency	19	16.2	26	5.0	45	7.0
Family medicine	15	12.8	49	9.4	64	10.0
ENT	3	2.6	2	.4	5	.8
Intensive care	2	1.7	106	20.3	108	16.9
Internal medicine	13	11.1	29	5.5	42	6.6
Obstetrics/ Gynaecology	9	7.7	34	6.5	43	6.7
Ophthalmology	3	2.6	4	.8	7	1.1
Paediatrics	7	6.0	38	7.3	45	7.0
Preventive medicine	1	.9	4	.8	5	.8
Psychiatry	-	-	2	.4	2	.3
Radiology	5	4.3	1	.2	6	.9
Surgery	4	3.4	44	8.4	48	7.5
Urology	6	5.1	8	1.5	14	2.2
Other	14	12.0	126	24.1	140	21.9
Multiple areas	2	1.7	44	8.4	46	7.2
Total	117	100.0	523	100.0	640	100.0

6.4 Patient Safety Domains

As described previously, the SAQ was used in this study to explore physicians' and nurses' attitudes toward six patient safety domains. This section is divided into two components: the first presents the results of the analysis of participants' responses for each item in the six domains; the second presents overall responses for each patient safety domain.

6.4.1 Participants' responses for each item in the six domains.

This section presents participants' responses for each item in the six domains. It shows mean scores, standard deviation (SD) and frequencies of participants' agreement (agree slightly and agree strongly responses) and disagreement (disagree slightly and disagree strongly responses) with each domain items arranged according to their profession.

6.4.1.1 Teamwork climate.

The teamwork climate domain had six items (Table 6.12). The results indicated that 79.7% of participants (73.5% of physicians and 81.1% of nurses) agreed that they could ask questions when there was something that they did not understand. However, 45.9% felt it was difficult to speak up if they perceived a problem with patient care. The majority of participants felt that physicians and nurses worked together, and that they were supported by other personnel. Only 14.5% of physicians and 8.6% of nurses considered that disagreement with other staff in their clinical area was not resolved appropriately.

Table 6.12: Teamwork climate domain items

Item	Profession	Mean (SD)	Frequencies	
			Disagree (%)	Agree (%)
Nurse input is well received in this clinical area.	Physician	3.78 (.88)	9.4	66.7
	Nurse	4.05 (.92)	3.4	68.6
	Overall	3.99 (.92)	4.5	68.3
In my clinical area, it is difficult to speak up if I perceive a problem with patient care.	Physician	3.23 (1.02)	24.8	41.0
	Nurse	3.43 (1.22)	24.1	47.0
	Overall	3.39 (1.18)	24.2	45.9
Disagreements in my clinical area are resolved appropriately (i.e. not who is right but what is best for the patient).	Physician	3.62 (1.03)	14.5	58.1
	Nurse	3.91 (1.02)	8.6	66.2
	Overall	3.86 (1.02)	9.7	64.7
I have the support I need from other personnel to care for patients.	Physician	3.76 (.90)	12.0	68.4
	Nurse	3.98 (1.02)	8.8	70.9
	Overall	3.94 (.99)	9.4	70.5
It is easy for personnel in my clinical area to ask questions when there is something that they do not understand.	Physician	4.01 (.96)	6.0	73.5
	Nurse	4.26 (.88)	3.4	81.1
	Overall	4.22 (.90)	3.9	79.7
The physicians and nurses here work together as a well coordinated team.	Physician	3.95 (.94)	9.4	74.4
	Nurse	4.05 (1.06)	8.6	72.8
	Overall	4.03 (1.04)	8.8	73.1

6.4.1.2 Safety climate items.

The safety climate domain had seven items (Table 6.13). The results revealed that 66.1% of participants felt that they would be safe if they were treated as patients in their hospital. Over 72.1% of nurses agreed that medical errors were handled appropriately in their working area, compared with 54.7% of physicians. Over half the participants believed that the culture in their clinical area enabled them to learn from the errors of others; 42.8% felt that it was difficult to discuss errors in their clinical area. Despite this the vast majority of participants, 79.7%, felt that they were encouraged by their colleagues to report any patient safety concerns, and 81.3% knew about the proper channels to direct questions regarding patient safety. In comparison with 65% of nurses, 43.6% of physicians indicated they received appropriate feedback about their performance.

Table 6.13: Safety climate domain items

Item	Profession	Mean (SD)	Frequencies	
			Disagree (%)	Agree (%)
I would feel safe being treated here as a patient.	Physician	3.90 (1.03)	9.4	72.6
	Nurse	3.86 (1.01)	9.2	64.6
	Overall	3.87 (1.01)	9.2	66.1
Errors in the delivery of care are handled appropriately in my clinical area.	Physician	3.53 (1.05)	17.1	54.7
	Nurse	4.04 (1.03)	7.1	72.1
	Overall	3.95 (1.05)	8.9	68.9
In this clinical area, it is difficult to discuss errors.	Physician	3.23 (1.12)	27.4	41.0
	Nurse	3.29 (1.19)	28.3	43.2
	Overall	3.29 (1.18)	28.1	42.8
I receive appropriate feedback about my performance.	Physician	3.25 (1.06)	24.8	43.6
	Nurse	3.87 (.99)	8.6	65.0
	Overall	3.76 (1.03)	11.6	61.1
I am encouraged by my colleagues to report any patient safety concerns I may have.	Physician	3.72 (.91)	8.5	65.0
	Nurse	4.36 (.81)	1.7	83.0
	Overall	4.24 (.87)	3.0	79.7
The culture in my clinical area makes it easy to learn from the errors of others.	Physician	3.51 (1.03)	14.5	58.1
	Nurse	3.58 (1.13)	15.5	53.3
	Overall	3.57 (1.11)	15.3	54.2
I know the proper channels to direct questions regarding patient safety in my clinical area.	Physician	3.72 (1.07)	16.2	65.0
	Nurse	4.38 (.81)	2.3	84.9
	Overall	4.26 (.90)	4.8	81.3

6.4.1.3 Job satisfaction domain.

Table 6.14 shows participants' responses to items from the job satisfaction domain. This domain includes five items related to participants' job enjoyment and experiences working in their hospital. The vast majority of participants agreed that they liked their job: 88.9% of the physicians and 89.1% of the nurses. Over 70% of physicians and nurses agreed that working in their hospital was like being a part of a large family. More nurses (74.4%) than physicians (67.5%) indicated that they were proud to work in their hospital. More nurses (72.3%) than physicians (68.4%) agreed

that the morale of staff in their clinical area was high. The results reveal that more than two thirds of participants felt that their hospitals were good places to work.

Table 6.14: Job satisfaction domain items

Item	Profession	Mean (SD)	Frequencies	
			Disagree (%)	Agree (%)
I like my job.	Physician	4.59 (.71)	.9	88.9
	Nurse	4.65 (.69)	.4	89.1
	Overall	4.64 (.69)	.5	89.1
Working in this hospital is like being part of a large family.	Physician	3.90 (1.01)	8.5	70.9
	Nurse	4.06 (1.01)	7.3	72.7
	Overall	4.04 (1.01)	7.5	72.3
This hospital is a good place to work.	Physician	3.83 (.96)	6.8	67.5
	Nurse	3.98 (.94)	4.6	68.3
	Overall	3.95 (.95)	5.0	68.1
I am proud to work at this hospital.	Physician	3.87 (1.04)	9.4	67.5
	Nurse	4.17 (.94)	3.1	74.4
	Overall	4.12 (.97)	4.2	72.8
Morale in my clinical area is high.	Physician	3.86 (1.06)	8.5	68.4
	Nurse	4.10 (.96)	5.2	72.3
	Overall	4.06 (.98)	5.8	71.6

6.4.1.4 Stress recognition domain.

Responses of participants in the stress recognition domain are summarised in Table 6.15. Overall responses indicated that physicians were more likely than nurses to recognise the effect of stressors such as workload and fatigue on their performance. Almost 45% of nurses felt that excessive workloads had an impact on their performance, in comparison with 65% of physicians. In comparison with 42.6% of nurses, 62.4% of physicians agreed that they were less effective when they were fatigued. Overall only 35.9% of participants indicated that fatigue affected their performance during emergency situations: 46.2% of physicians and 33.7% of nurses. Compared with 46% of physicians, only 33.7% of nurses admitted they were more likely to make errors in tense or hostile situations.

Table 6.15: Stress recognition domain items

Items	Profession	Mean (SD)	Frequencies	
			Disagree (%)	Agree (%)
When my workload becomes excessive, my performance is impaired.	Physician	3.59 (1.20)	21.4	65.0
	Nurse	3.05 (1.46)	38.0	44.4
	Overall	3.15 (1.43)	35.0	48.1
I am less effective at work when fatigued.	Physician	3.62 (1.15)	20.5	62.4
	Nurse	2.95 (1.39)	40.7	42.6
	Overall	3.07 (1.38)	37.0	46.3
I am more likely to make errors in tense or hostile situations.	Physician	3.21 (1.33)	31.6	48.7
	Nurse	2.64 (1.39)	47.4	30.2
	Overall	2.74 (1.39)	44.5	33.6
Fatigue impairs my performance during emergency situations (e.g., emergency resuscitation, seizure).	Physician	3.18 (1.25)	30.8	46.2
	Nurse	2.66 (1.37)	45.1	33.7
	Overall	2.76 (1.36)	42.5	35.9

6.4.1.5 Perceptions of management domain.

Table 6.16 presents the responses of participants in regard to perceptions of management. This domain includes four items related to staffing and management support. More physicians (18.8) than nurses (12.8) disagreed that hospital administration supported their daily efforts. In comparison to 47% of nurses, 39.3% of physicians indicated that the staffing levels in their clinical area were sufficient to handle the number of patients. Up to 53.5% of nurses and 38.5% of physicians felt that information about events that might affect their work was provided to them in an adequate and timely manner. The results also reveal that only 35.8% of nurses and 41.0% of physicians agreed that management in their hospital did not knowingly compromise patient safety.

Table 6.16: Perceptions of management domain items

Item	Profession	Mean (SD)	Frequencies	
			Disagree (%)	Agree (%)
Hospital administration supports my daily efforts.	Physician	3.52 (1.16)	18.8	53.8
	Nurse	3.54 (1.03)	12.8	50.1
	Overall	3.53 (1.06)	13.9	50.8
Hospital management does not knowingly compromise the safety of patients.	Physician	3.35 (1.12)	18.8	41.0
	Nurse	3.04 (1.34)	31.7	35.8
	Overall	3.10 (1.31)	29.4	36.7
The levels of staffing in this clinical area are sufficient to handle the number of patients.	Physician	2.89 (1.28)	45.3	39.3
	Nurse	3.20 (1.40)	33.8	47.6
	Overall	3.15 (1.38)	35.9	46.1
I am provided with adequate, timely information about events in the hospital that might affect my work.	Physician	3.14 (1.03)	26.5	38.5
	Nurse	3.58 (1.15)	13.8	53.0
	Overall	3.49 (1.14)	16.1	50.3

6.4.1.6 Working conditions domain.

Table 6.17 shows the responses of participants to four items of the working conditions domain. These relate to training new personnel, the availability of necessary information, disciplinary policies and supervision of trainees. The vast majority of nurses (75.9%) agreed that their hospital did a good job of training new personnel, in contrast to 46.2% of physicians. Only 37.6% of physicians and 43.4% of nurses felt that their hospital constructively dealt with problem personnel. Most of the nurses (75.5%) agreed that trainees in their discipline received adequate supervision, while only 51.3% of physicians felt that physician trainees were adequately supervised. The results also indicated that almost two-thirds of nurses (62%) and half of physicians (49.6%) agreed that all the necessary information needed to make diagnostic and therapeutic decisions was routinely available to them.

Table 6.17: Working condition domain items.

Item	Profession	Mean (SD)	Frequencies	
			Disagree (%)	Agree (%)
This hospital does a good job of training new personnel.	Physician	3.27 (1.06)	23.1	46.2
	Nurse	4.09 (.95)	6.5	75.9
	Overall	3.94 (1.02)	9.5	70.5
All the necessary information for diagnostic and therapeutic decisions is routinely available to me.	Physician	3.38 (1.08)	19.7	49.6
	Nurse	3.70 (.99)	12.2	62.0
	Overall	3.64 (1.01)	13.6	59.7
This hospital constructively deals with problem personnel.	Physician	3.16 (.96)	22.2	37.6
	Nurse	3.40 (1.09)	17.6	43.4
	Overall	3.36 (1.08)	18.4	42.3
Trainees in my discipline are adequately supervised.	Physician	3.53 (.99)	12.8	51.3
	Nurse	4.05 (.98)	8.8	75.5
	Overall	3.95 (1.00)	9.5	71.1

6.4.2 Overall responses for each patient safety domain.

This section presents the overall results of the data analysis of participants' responses to the six patient safety domains. The overall mean scores and standard deviation for each domain are presented in Table 6.18. Mean scores ranged from 2.93 (with 100Pt scale of 48.35) to 4.16 (with 100Pt scale of 79.06). Overall, all patient safety domains scored below 75% with the exception of the job satisfaction domain (4.16 with 100Pt scale of 79.06) followed by teamwork climate (3.90 with 100Pt scale of 72.61) and then safety climate (3.85 with 100Pt scale of 71.28). The stress recognition domain received the lowest mean scores (2.93 with 100Pt scale of 48.35).

Table 6.18 shows that nurses had the highest mean scores on patient safety domains except for stress recognition. The mean score of this domain for physicians (3.39 with 100Pt scale of 59.79) was higher than for nurses (2.83 with 100Pt scale of 45.79). The mean score of job satisfaction for nurses was 4.19 (with 100Pt scale of 79.89), which was higher than for physicians (4.02 with 100Pt scale of 75.38). Perceptions of management domain received the lowest mean score from physicians

(3.23 with 100Pt scale of 55.64). In contrast, the stress recognition domain received the lowest mean score among nurses (2.83 with 100Pt scale of 45.79).

Table 6.18: Participants' attitudes toward patient safety domains according to their profession

Patient Safety Dimension	Physicians		Nurses		Overall	
	X (SD)	100pt	X (SD)	100pt	X (SD)	100pt
Teamwork climate	3.72 (.63)	68.0	3.95 (.65)	73.64	3.90 (.65)	72.61
Safety climate	3.55 (.66)	63.85	3.92 (.57)	72.94	3.85 (.61)	71.28
Job satisfaction	4.02 (.70)	75.38	4.19 (.65)	79.89	4.16 (.67)	79.06
Stress recognition	3.39 (.8)	59.79	2.83 (1.06)	45.79	2.93 (1.05)	48.35
Perceptions of management	3.23 (.74)	55.64	3.35 (.71)	58.69	3.33 (.71)	58.13
Working conditions	3.33 (.78)	58.37	3.82 (.73)	70.39	3.73 (.76)	68.19

Note. 100pt (100-point scale) = (mean of the scale-1)*25

6.5 Number of Participants with Positive Attitudes

The number of participants with positive responses to the six patient safety domains was calculated. A positive response was defined as a mean scale score of 75% or above. Table 6.19 shows the number of participants with positive scores and their percentages, from 21.1% for stress recognition to 68.4% for job satisfaction.

Table 6.19: Number of participants with positive attitudes

Patient Safety Domain	Number of participants with positive attitudes						χ^2	P value
	Physicians (n=117)		Nurses (n=523)		Overall (n=640)			
	N.	%	N.	%	N.	%		
Teamwork climate	49	41.9	272	52.0	321	50.2	3.922	.048
Safety climate	35	29.9	261	49.9	296	46.3	15.369	.000
Job satisfaction	75	64.1	363	69.4	438	68.4	1.246	.264
Stress recognition	34	29.1	101	19.3	135	21.1	5.459	.019
Perceptions of management	17	14.5	124	23.7	141	22.0	4.690	.030
Working conditions	25	21.4	247	47.2	272	42.5	26.164	.000

Note. Cut-off point of 75% and above was used as a positive attitude

Differences between physicians' and nurses' attitudes to each domain were determined by using the Chi-square test. The results indicated a statistically significant difference between physicians' and nurses' attitudes toward teamwork climate ($\chi^2 = 3.922$, $P = .048$): 52.0% of nurses had positive attitudes toward the teamwork climate in their hospital compared to 41.9% of physicians. A statistically significant difference between physicians and nurses was also identified in the safety climate domain ($\chi^2 = 15.369$, $P < .001$), where more nurses (49.9%) than physicians (29.9%) revealed positive attitudes.

The results also revealed a statistically significant difference between physicians' and nurses' attitudes toward stress recognition ($\chi^2 = 5.459$, $P = .019$). More physicians (29.1%) than nurses (19.3%) had positive attitudes toward stress recognition. Although a low percentage of both physicians and nurses had positive attitudes toward perceptions of management, a statistically significant difference was found between their attitudes ($\chi^2 = 4.690$, $P = .030$). More nurses evinced positive attitudes toward perceptions of management (23.7%) than physicians (14.5%). The difference in physicians' and nurses' attitudes toward working conditions was also found to be statistically significant ($\chi^2 = 26.164$, $P < .001$), with more nurses than physicians satisfied with them (47.2% and 21.4% respectively). There was no significant difference between physicians' and nurses' attitudes in regard to job

satisfaction ($\chi^2 = 1.246, P > .05$): the results revealed that the majority of both physicians and nurses were satisfied with their experiences in their hospital, with more nurses (69.4%) than physicians (64.1%) manifesting positive attitudes toward job satisfaction.

6.6 Association Between Participants' Characteristics and Attitudes

This section presents associations between participants' attitudes toward the six patient safety domains and their characteristics such as gender, nationality, job category, level of education, years of experience in their specialty, years of work experience, and clinical area.

6.6.1 Participants' gender.

Table 6.20 presents the association between participants' attitudes toward patient safety domains and their gender. The results revealed that there were no statistically significant associations between physicians' and nurses' gender and their attitudes about the six patient safety domains ($p > 0.05$).

Table 6.20: Association between participants' attitudes toward patient safety domains and their gender

Gender		Patient Safety Domains					
		TC	SC	JS	SR	PM	WC
Physicians							
	Male	40.2	32.0	66.0	30.9	16.5	21.6
	Female	50.0	20.0	55.0	20.0	5.0	20.0
	positive attitudes (%)						
	χ^2	.653	1.131	.869	.961	1.764	.027
	<i>P</i> value	.419	.288	.351	.327	.299*	1.000*
Nurses							
	Male	54.3	40.0	80.0	17.1	28.6	51.4
	Female	51.8	50.6	68.6	19.5	23.4	46.9
	positive attitudes (%)						
	χ^2	.078	1.472	1.982	.113	.490	.266
	<i>P</i> value	.780	.225	.159	.736	.484	.606

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions

6.6.2 Participants' nationality

The association between participants' nationalities and their attitude toward patient safety domains are presented in Table 6.21. The results of the Chi-square test indicated a significant association between physicians' nationality and their perceptions of management ($\chi^2 = 10.710$, $P = .005$): 19.4% of Egyptian physicians had positive attitudes about management. The results also revealed that none of the Saudi physicians had positive attitudes toward management. The Cramer's V coefficient of .237 indicated a low association between physicians' nationality and their attitudes as revealed in the management domain. The results of the Chi-square test also indicated no significant associations between physicians' nationality and their attitudes toward the other patient safety domains; teamwork climate ($\chi^2 = 1.889$, $P = .389$), safety climate ($\chi^2 = 1.396$, $P = .498$), job satisfaction ($\chi^2 = .606$, $P = .739$) and working conditions ($\chi^2 = .411$, $P = .814$).

Table 6.21: Association between participants' attitudes toward patient safety domains and their nationality

Nationality		Patient Safety Domains					
		TC	SC	JS	SR	PM	WC
Physicians							
Saudi	positive attitudes (%)	42.5	27.5	60.0	27.5	.0	20.0
Egyptian		33.3	25.0	63.9	22.2	19.4	25.0
Other		48.8	36.6	68.3	36.6	24.4	19.5
x^2		1.889	1.396	.606	1.990	10.710	.411
P value		.389	.498	.739	.370	.005	.814
Nurses							
Saudi	positive attitudes (%)	31.3	43.8	50.0	18.8	6.3	31.3
Filipino		47.8	43.7	63.2	23.1	16.2	42.9
Indian		59.5	62.6	82.6	14.4	35.4	57.9
Malaysian		41.9	27.9	53.5	20.9	14.0	23.3
Other		68.2	54.5	68.2	18.2	36.4	59.1
x^2	1.889	25.029	28.425	5.410	29.314	23.632	
P value	.011	.000	.000	.226*	.000*	.000	

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions.

Table 6.21 also illustrates associations between nurses' nationality and their attitudes toward the patient safety domains. The results of the Chi-square test indicated that the nationality of nurses was associated with their attitudes toward teamwork climate ($x^2 = 1.889$, $P = .011$), safety climate ($x^2 = 25.029$, $P < 0.001$), job satisfaction ($x^2 = 28.425$, $P < 0.001$) and working conditions ($x^2 = 23.632$, $P < 0.001$). Indian nurses had the highest percentage of positive attitudes toward teamwork climate (59.5%), safety climate (62.6%), job satisfaction (82.6%), and working conditions (57.9%), followed by Filipino nurses. Saudi nurses had the lowest percentage of positive attitudes toward the teamwork climate (31.3%) and job satisfaction (50%), while Malaysian nurses had the lowest percentage of positive attitudes toward the safety climate (27.9%) and working conditions (23.3%). The value of Cramer's V co-efficient indicated that the level of association between

nurses' nationality and their attitudes toward these domains was small: teamwork (.158), safety climate (.219), job satisfaction (.233) and working conditions (.213).

The results of Fisher's exact test as shown in Table 6.21 indicated that nurses' perceptions of management were statistically associated with their nationality ($P = 001$). Indian nurses had the highest percentage of positive attitudes toward management (35.4%) while Saudi nurses had the lowest percentage (6.3%). The percentage of Filipino nurses who had positive attitudes toward management was slightly more than Malaysians (16.2% and 14.0% respectively). The value of Cramer's V co-efficient (.237) indicated a small level of association between nurses' nationalities and their attitudes toward management. There was no statistically significant association between nurses' attitudes toward stress recognition and their nationality ($P = .226$).

6.6.3 Participants' job category.

Table 6.22 shows the association between participants' attitudes toward patient safety domains and job category. The results revealed no statistically significant associations between nurses' job category and their attitudes in the six patient safety domains ($p > 0.05$); however, the results indicated a statistically significant association between physicians' job category and their attitudes toward the teamwork climate ($\chi^2 = 6.467, P = .039$). The largest physicians' group with positive attitudes toward the teamwork climate were specialists/registrar physicians, with a percentage of 54.0%, followed by resident physicians and consultant physicians (41.7% and 27.9% respectively). The strength of this association was small (Cramer's V value = .235). There was a statistically significant association between physicians' job category and their attitudes toward stress recognition ($\chi^2 = 7.551, P = .023$). Consultant physicians were more likely to have positive attitudes toward stress recognition (44.2%) than other physicians' groups. The results of Cramer's V test revealed that the level of association between physicians' attitudes and their job categories was small (Cramer's V=.254). Non-significant associations were identified between physicians' job category and their attitudes toward other patient safety domains ($p > 0.05$).

Table 6.22: Association between participants' attitudes toward patient safety domains and their job category

Job Category		Patient Safety Domains					
		TC	SC	JS	SR	PM	WC
Physicians							
Consultant	positive attitudes (%)	27.9	30.2	76.7	44.2	20.9	18.6
Specialist/Registrar		54.0	32.0	60.0	20.0	14.0	24.0
Resident Physicians		41.7	25.0	50.0	20.8	4.2	20.8
	χ^2	6.467	.382	5.426	7.551	3.505	.406
	<i>P</i> value	.039	.826	.066	.023	.186*	.816
Nurses							
Head/ Charge Nurse	positive attitudes (%)	64.4	47.9	60.4	25.0	14.6	43.8
Registered Nurse		50.8	49.0	70.2	19.4	24.3	45.0
Nurse Technician		50.5	54.8	71.0	16.1	25.8	58.1
	χ^2	3.351	1.120	2.035	1.602	2.522	5.358
	<i>P</i> value	.187	.571	.361	.449	.283	.069

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions.

6.6.4 Participants' level of education.

Table 6.23 presents the association between participants' attitudes in the patient safety domains and their level of education. The results revealed no statistically significant associations between physicians' level of education and their attitudes in the six domains ($p > 0.05$); however, the Chi-square test indicated a statistically significant association between nurses' level of education and their attitudes in all patient safety domains ($p < 0.05$). Nurses who held a diploma had the highest percentage of positive attitudes, with the exception of the stress recognition domain; nurses who held a Bachelor's degree or higher were more likely to have positive attitudes to stress recognition. The values of the Phi co-efficient indicated a small level of association between nurses' level of education and their attitudes in all six domains.

Table 6.23: Association between participants' attitudes toward patient safety domains and their level of education

Level of education	Patient Safety Domains						
	TC	SC	JS	SR	PM	WC	
Physicians							
Bachelor	44.4	33.3	55.6	25.9	11.1	29.6	
Postgrad Dip/ Master	42.9	21.4	54.8	26.2	16.7	14.3	
PhD	39.6	35.4	77.1	33.3	14.6	22.9	
	positive attitudes (%)						
	x^2	.193	2.286	5.964	.722	.409	2.419
	<i>P</i> value	.908	.319	.051	.697	.943*	.298
Nurses							
Diploma	57.4	57.7	77.2	14.7	32.4	52.9	
Bachelor & above	46.2	41.4	61.0	24.3	14.3	41.0	
	positive attitudes (%)						
	x^2	6.488	13.850	16.233	7.716	23.410	7.424
	<i>P</i> value	.011	.000	.000	.005	.000	.006

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions

6.6.5 Participants' years of experience in specialty.

The results shown in Table 6.24 revealed no significant associations between physicians' attitudes toward the six patient safety domains and their years of experience in their specialty ($p > 0.05$). The percentage of physicians with positive attitudes did not significantly differ by experience in a specialty.

The Chi-square results indicated no significant associations between nurses' years of experience in their specialty and their attitudes toward teamwork, safety, job satisfaction, management and working conditions ($p > 0.05$). The only statistically significant association was found between nurses' years of experience in their specialty and their attitudes toward stress recognition ($P = .001$). Nurses with more years of experience in the specialty were more likely to have positive attitudes about stress recognition. Thirty-two per cent of nurses with 13 or more years of experience in their specialty had positive attitudes toward stress. Cramer's V co-efficient (0.169) indicates a small level of association between nurses' years of experience in their specialty and their attitudes to stress recognition.

Table 6.24: Association between participants' attitudes toward patient safety domains and total years of experience in specialty

Years of experience in a specialty		Patient Safety Domains					
		TC	SC	JS	SR	PM	WC
Physicians							
< 7 years	% of positive attitudes	41.7	27.8	52.8	22.2	13.9	19.4
8–12 years		54.8	35.5	64.5	25.8	9.7	22.6
13 + years		34.0	28.0	72.0	36.0	18.0	22.0
χ^2		3.415	.624	3.364	2.144	1.085	.118
P value		.181	.732	.186	.342	.602*	.943
Nurses							
< 7 years	% of positive attitudes	50.2	50.8	70.1	14.8	25.1	48.9
8–12 years		52.5	42.4	68.7	22.2	21.2	41.4
13 + years		58.1	54.8	67.7	32.3	21.5	47.3
χ^2		1.835	3.217	.218	14.859	.933	1.733
P value		.400	.200	.897	.001	.627	.420

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions.

6.6.6 Participants' years of work experience.

The results presented in Table 6.25 indicated no statistically significant associations between physicians' work experience and their attitudes toward the six patient safety domains ($p > 0.05$). The percentage of physicians with positive attitudes did not differ significantly according to their work experience.

The Chi-square test indicated a link between work experience and nurse' attitudes to teamwork ($\chi^2 = 6.900$, $P = .032$). More than 66% of nurses with work experience of 21 years and above had positive attitudes to the teamwork climate, although the level of association was small (Cramer's V co-efficient=0.115). Another statistically significant association was found between nurses' work experience and their attitudes toward working conditions ($\chi^2 = 12.470$, $P = .002$). Up to 58.7% of nurses with work experience of 21 years had positive attitudes toward working conditions. Cramer's V test revealed a small level of association between experience and attitudes toward working conditions ($V = 0.154$). In regard to other patient safety

domains, results indicated no statistically significant associations between nurses' experience and their attitudes ($p > 0.05$).

Table 6.25: Association between participants' attitudes toward patient safety domains and total years of work experience

Years of work experience		Patient Safety Domain					
		TC	SC	JS	SR	PM	WC
Physicians							
< 7 years	% of positive attitudes	43.5	34.8	60.9	13.0	21.7	17.4
8 – 12 years		44.4	25.4	60.3	30.2	11.1	25.4
21 + years		35.5	35.5	74.2	38.7	16.1	16.1
χ^2		.715	1.332	1.869	4.299	1.619	1.331
P value		.699	.514	.393	.117	.443*	.594*
Nurses							
< 7 years	% of positive attitudes	51.6	50.5	69.1	15.3	24.7	51.3
8 – 12 years		47.6	44.9	69.2	22.2	21.6	37.3
21 + years		66.7	61.9	71.4	28.6	25.4	58.7
χ^2		6.900	5.554	.138	7.310	.703	12.470
P value		.032	.062	.933	.026	.704	.002

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions.

6.6.7 Participants' clinical area.

The percentages of positive attitudes in the six patient safety domains varied by clinical area (see Table 6.26). The Chi-square test revealed that physicians' job satisfaction was associated with their area of work ($\chi^2 = 11.754$, $P = .019$). Eighty per cent of physicians who were working in family medicine were satisfied with their job: more than those in any other department. The emergency department had the lowest percentage of physicians (31.6%) with positive attitudes toward job satisfaction. A Cramer's V co-efficient of .317 suggested a medium level of association between physicians' job satisfaction and their clinical area. In regard to other patient safety domains, the results revealed no significant associations between clinical area and physicians' attitudes ($P > 0.05$).

Table 6.26: Association between participants' attitudes in patient safety domains and their clinical areas

Clinical area	Patient Safety Domain						
	TC	SC	JS	SR	PM	WC	
Physicians							
Emergency	26.3	15.8	31.6	21.1	5.3	10.5	
Family medicine	60.0	40.0	80.0	26.7	6.7	33.3	
Surgery	33.3	33.3	72.2	38.9	22.2	22.2	
Internal medicine	31.3	18.8	75.0	37.5	.0	6.3	
Other	49.0	34.7	65.3	26.5	22.4	26.5	
	% of positive attitudes						
	x^2	6.212	4.121	11.754	2.181	8.113	5.569
	<i>P</i> value	.184	.396*	.019	.702*	.086*	.239*
Nurses							
Emergency	30.8	30.8	57.7	23.1	.0	15.4	
Family medicine	36.0	42.0	56.0	20.0	16.0	44.0	
Surgery	49.2	50.8	74.6	33.9	8.5	39.0	
Intensive care	57.5	48.1	72.6	10.4	34.9	44.3	
Internal medicine	37.7	31.1	62.3	21.3	19.7	36.1	
Obstetrics/ gynaecology	73.5	70.6	82.4	17.6	41.2	70.6	
Paediatrics	47.5	52.5	61.0	11.9	22.0	50.8	
Operating room	50.0	86.4	95.5	45.5	36.4	45.5	
Other	62.9	54.8	66.1	19.4	21.0	58.1	
Multiple areas	68.2	54.5	79.5	13.6	31.8	65.9	
	% of positive attitudes						
	x^2	30.722	32.462	22.744	26.614	34.821	32.665
	<i>P</i> value	.000	.000	.007	.002*	.000	.000

Note. * = Fisher's Exact Test; TC = Teamwork climate; SC = Safety climate; JS = Job satisfaction; SR = Stress Recognition; PM = Perceptions of management; WC = Working conditions

The data in Table 6.26 revealed that nurses' attitudes in all six patient safety domains were significantly associated with their clinical area: teamwork climate ($x^2 = 30.722$, $P = .000$), safety climate ($x^2 = 32.462$, $P = .000$), job satisfaction ($x^2 = 22.744$, $P = .007$), stress recognition ($x^2 = 26.614$, $P = .002$), perceptions of management ($x^2 = 34.821$, $P = .000$), working conditions ($x^2 = 32.665$, $P = .000$).

Cramer's V co-efficient values range between .209 and .258, indicating a small level of association between nurses' attitudes in the six domains and their work area.

The percentage of nurses with positive attitudes ranged from a high level of job satisfaction (95.5%) in those working in OR to a low of 0.00% toward management among those working in ED. The highest percentage of nurses with positive attitudes toward teamwork climate (73.5%) was reported in obstetrics/gynaecology departments; the lowest in the emergency department (30.8%). Eighty-six per cent of nurses in OR had positive attitudes toward safety climate as compared to only 30.8% of nurses in the emergency department. The operating room also had the highest percentage of nurses with positive attitudes toward job satisfaction (95.5%). Only 57.7% of those in the emergency department had positive attitudes toward job satisfaction. The OR again had the highest number of nurses with positive attitudes toward stress recognition (45.5%). The lowest percentage of nurses with positive attitudes toward stress recognition (10.4%) worked in intensive care.

The results also indicated that 41.2% of nurses in obstetrics and gynaecology had positive perceptions of management. In the emergency department, none did. The obstetrics and gynaecology departments also had the highest percentage of nurses with positive attitudes toward their working conditions (70.6%), compared with emergency department nurses who had the lowest rate of positive attitudes to working conditions (15.4%).

6.7 The Quality of Collaboration and Communication

The SAQ included a question about collaboration and communication. It asked participants to describe the quality of collaboration and communication they had experienced with other health care workers. A Likert scale ranging from one (very high) to six (very low) was used to indicate participants' answers. Table 6.27 shows the percentage of participants rating the quality of collaboration and communication they had experienced with other health care workers as high or very high.

Table 6.27: Collaboration and communication rated high/very high

Job Category	Health Care Worker								
	Physician	Consultant physician	Specialist/ Registered physician	Resident physician	Nurse	Head/ Charge nurse	Nurse consultant	Specialist/ Registered nurse	Nurse technician
Physician	67.2	54.0	68.8	58.6	44.2	56.8	33.0	51.9	39.3
Consultant physician		69.0	83.3	64.3		61.9	43.9	63.4	46.3
Specialist/ Registrar		41.7	66.0	58.7		54.3	30.2	46.7	40.9
Resident Physician		52.2	47.8	47.8		52.2	18.2	40.9	22.7
Nurse	52.9	43.1	46.5	47.1	57.7	74.9	39.5	73.6	56.8
Head/ Charge nurse		47.9	45.8	45.8		68.8	28.6	70.2	45.8
Specialist/ Registered nurse		41.8	48.3	47.4		76.5	39.8	74.8	54.7
Nurse technician		45.9	39.5	46.6		72.1	43.6	70.9	71.8

The findings indicated that the quality of collaboration and communication between health care workers varied according to job category. The percentage of participants who rated their collaboration and communication with other health care workers as high or very high ranged from 18.2% (between resident physicians and nurse consultants) to 83.3% (between consultant physicians and specialists/registrar physicians). Consultant physicians rated collaboration and communication with specialist/registrar physicians (83.3%) and resident physicians (64.3%) positively, but only 41.7% of specialist/registrar physicians and 52.2% of resident physicians rated their quality of collaboration and communication with consultant physicians as high or very high. Sixty-six per cent of specialist/registrar physicians rated collaboration and communication with their peers higher than with other categories of physician.

The results indicated that 70.2% of head/charge nurses rated collaboration and communication with specialist/registered nurses more positively than among themselves or with other nurses. In contrast, 76.5% of specialist/registered nurses rated their collaboration and communication with head/charge nurses as high or very high. Nurse technicians rated their collaboration and communication with head/charge nurses more positively (72.1%) than did the head/charge nurses with

them (45.8%). From the results in Table 6.27, it can be seen that consultant nurses received the lowest ratings for their quality of collaboration and communication from other health care workers.

Overall, the SAQ findings indicated that only 44.2% of physicians rated their quality of collaboration and communication with nurses as high or very high, while 52.9% of nurses rated their quality of collaboration and communication with physicians as high or very high. Further, the quality of collaboration and communication among physicians was higher than among nurses (67.2% for physicians and 57.7% for nurses).

6.8 Open-ended Question

The SAQ included an open-ended question to enable participants to record their suggestions (recommendations) for improving patient safety in their hospitals. Of the 640 participants who completed the survey, 51.6% wrote comments, including almost half the nurses and 61.5% of the physicians. The number of comments made by each participant ranged from one to three. Table 6.28 shows the number and percentage of participants who responded to the open-ended question and offered suggestions for improving patient safety.

Table 6.28: Number of participants who responded to open-ended question

Profession	No. of participants	%
Physician (117)	72	61.5%
Nurse (523)	258	49.3%
Total (640)	330	51.6%

Following analysis of the open ended-question, participants' recommendations were categorised into ten themes: improve communication and teamwork; improve staffing level and quality; improve the safety climate; improve staff working conditions; provide adequate resources and better infrastructure; improve staff education and training; focus more on patients; enforce compliance with rules and regulations; and provide better leadership and management.

Table 6.29 shows physicians' recommendations with the most popular suggestions listed first. The most common suggestion they made was to improve communications and teamwork (43.0%). Improving staffing levels and the quality of

the staff was the second most frequent suggestion made (37.5%), followed by more staff education and training (36.1%). Adequate resources and better infrastructure were suggested by 34.7% of physicians, and 28% felt that staff working conditions needed to be improved. Compliance with rules and regulations was proposed by 20.8%, followed by better leadership and management (19.4%). Improving the safety climate and putting more focus on patients were the least frequent suggestions made by physicians.

Table 6.29: Physicians' recommendations for improving patient safety

Themes	Physicians (72)	
	N	%
Improve communication and teamwork	31	43.0
Improve staffing level and the staff quality	27	37.5
Increase staff education and training	26	36.1
Provide adequate resources and better infrastructure	25	34.7
Improve staff working conditions	20	27.8
Enforce compliance with rules and regulations	15	20.8
Provide better leadership and management	14	19.4
Improve safety climate	12	16.7
Place more focus on patients	11	15.3

Table 6.30 shows nurses' recommendations, ranked similarly. Again, improving communication and teamwork was the most frequent suggestion (44.6%). The second most frequent was to improve the safety climate. Almost 31% of nurses who responded to the open-ended question suggested that the safety climate needed improvement. Improving staffing levels and staff quality was the third most frequent suggestion (29.8%). Improving staff working conditions was suggested by 27.5% of nurses, followed by more focus on patients (23.3%). Adequate resources and better infrastructure were suggested by 22.5% of nurses followed by staff education and training (21.3%), compliance with rules and regulations (16.7%) and better leadership and management (10.5%).

Table 6.30: Nurses' recommendations for improving patient safety

Theme	Nurses (258)	
	N	%
Improve communication and teamwork	115	44.6
Improve safety climate	79	30.6
Improve staffing level and the staff quality	77	29.8
Improve staff working conditions	71	27.5
Place more focus on patients	60	23.3
Provide adequate resources and better infrastructure	58	22.5
Improve staff education and training	55	21.3
Enforce compliance with rules and regulations	43	16.7
Provide better leadership and management	27	10.5

As can be seen in Tables 6.30 and 6.31, the frequency of suggestions varied between physicians and nurses, although of the top three suggestions two were common to both groups. Despite finding that the majority of participants (>70%) felt that physicians and nurses worked as a well-coordinated team (see Table 6.12), improving communication and teamwork was the most frequent suggestion made by both groups. Improving staffing levels and quality was the second most common suggestion made by physicians and the third by nurses. This may reflect participants' opinions of the adequacy of staffing in their clinical area (see Table 6.16). Compared with 47.6% nurses, only 39.3% of physicians agreed that the level of staffing in their clinical area was sufficient to handle the number of patients.

Staff education and training was the third most common suggestion made by physicians while it was ranked seventh by nurses. Participants' comments about staff education and training may reflect their opinions of or experiences with training in their hospitals. The SAQ findings revealed that about half the physicians agreed their hospital did a good job of training new personnel, and that trainees in their discipline received adequate supervision; more than 75% of nurses agreed with these statements (see Table 6.17).

Despite the SAQ findings that more nurses than physicians had positive attitudes toward the safety climate (see Table 6.19), the second most frequent suggestion made by nurses was to improve the safety climate, which ranked eight for physicians. This finding may be due to the fact that nurses often worked at the

bedside of patients and were more aware of the need to improve safety of care within the hospital.

6.9 Summary

The results of the quantitative phase of this study have revealed that the physicians and nurses surveyed had discrepant attitudes toward patient safety. Significant differences were found in their attitudes toward five patient safety domains (with the exceptions of job satisfaction). More nurses than physicians had positive attitudes about patient safety domains, except with regard to stress recognition. Physicians recognised the effect of stressors on their performance more than nurses. The results also indicated that nurses' attitudes in the various domains were affected, to some degree, by demographic characteristics such as their nationality, level of education, work area, work experience and specialty experience. In comparison, physicians' attitudes were affected only by job category, work area and nationality.

In this phase, a number of suggestions were made by participants to improve patient safety. These recommendations included improving communication and teamwork, improving staffing levels and quality, improving the safety climate, improving working conditions, providing adequate resources and better infrastructure, improving staff education and training, placing more focus on patient safety, enforcing compliance with rules and regulations, and providing better leadership and management. Improving communication and teamwork was the most frequent suggestion made by physicians as well as nurses; the other suggestions showed no similarity of urgency.

The results of this quantitative phase have provided a general picture of physicians' and nurses' attitudes toward patient safety, but do not provide sufficient information about why discrepancies appear. Further investigation is required, this time using qualitative data, to explore these differences in more depth and to identify why differences exist between physicians and nurses. The next chapter will describe the qualitative phase method of this study, phase two. The results of phase two will be presented in Chapter 8.

Chapter 7: Qualitative Phase Method

7.1 Introduction

This chapter describes the qualitative phase method denoted as phase two. The chapter begins by detailing the data collection process, including recruitment of participants and the data collection, and details the process involved in analysing the data. Finally, the techniques used to validate qualitative data are addressed.

7.2 Recruitment of Participants

A purposive sampling technique was used to recruit physicians and nurses to participate in phase two. This is a qualitative sampling technique which allows the researcher to select participants deliberately, based on the needs of the study (Boeije, 2010). In the current study, the need for conducting the second phase was to deepen the understanding of inferences drawn from the first phase, so certain inclusion criteria were incorporated to recruit participants. The first was to recruit physicians and nurses who would provide an in-depth understanding of why they had different attitudes toward patient safety. Patton (2002) has stated that “the logic and power of purposeful sampling lie in selecting information-rich cases for study in depth. Information rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry” (p. 230).

Diversity of participants by nationality and job category was the second criterion, based on the expectation that this would result in a variety of opinions and experiences being recorded. King and Horrocks (2010) have reported that the most commonly suggested criterion used for selecting samples in qualitative research is diversity. Recruiting participants from different nationalities and job categories will add more insight to the study problem as the participants have different experiences. Another criterion was that participants should have had at least one year of work experience in that particular hospital. It was not necessary that participants in phase two had participated in phase one, but this condition ensured that the participants had been working on the study sites at the time of the quantitative data collection in phase one.

To access participants at each study site, it was necessary that the researcher first meet the hospital director. The intention of these meetings was to disclose the purpose of phase two and seek help in supporting and facilitating data collection in

their hospitals. The second step was meeting the medical director and head of the nursing department in each site, first to disclose the purpose of this phase of the study, and then to seek help in identifying individuals who might participate and who met the recruitment criteria. Each medical director and head of nursing contacted physicians and nurses individually and invited them to participate. This process was repeated until the researcher felt no new information would be obtained by interviewing new participants.

7.3 Data Collection

Semi-structured interviews were utilised to collect qualitative data in phase two. This is one of the most common methods for collecting qualitative data (Byrne, 2001; DiCicco-Bloom & Crabtree, 2006; King & Horrocks, 2010; Qu & Dumay, 2011), and was chosen because of its flexibility and its capacity to provide an in-depth understanding of the inferences drawn from the quantitative data analysis in phase one. Interviews are a useful method of focusing on a particular topic and gaining information from participants (Hesse-Biber & Leavy, 2011). Through interviews, researchers can gain detailed rich information on participants' experiences, views and feelings (Buston, Parry-Jones, Livingston, Bogan, & Wood, 1998). They also provide an opportunity for participants to talk about or explain their thoughts or perspectives on a range of topics and share their stories and experiences (Hesse-Biber & Leavy, 2011).

7.4 Interview Schedule

An interview schedule was developed to guide the interview process. This included an initial list of open-ended questions originating from the inferences drawn in phase one. The list was reviewed by the study's supervisor, who has an extensive background in qualitative research, and her subsequent feedback was used to modify the interview schedule and ensure both clarity and brevity of the questions to encourage maximum participation.

The final schedule consisted of six questions. Five focused on the main inferences drawn from the quantitative phase and were designed to explore why physicians and nurses had different attitudes toward patient safety. An additional question was included to investigate the impact of workforce diversity on patient safety.

7.5 Interview Process

The researcher was aware that his administrative position within the MSD might affect participants' willingness to participate in interviews, and it was very important to emphasise that in this situation his position was as a PhD student. In this phase the researcher chose to interview participants on an individual basis, face to face. This decision was made to allow the researcher to build rapport and ensure the privacy of participants, and thus encourage candid conversation. Interviews were conducted in Arabic or English according to each participant's preference. The choice of language provided the best opportunity for participants to communicate effectively.

Over a period of two months, between June and July 2012, a total of 20 interviews were conducted. Eleven interviews were conducted with nurses and nine with physicians; all met the inclusion criteria detailed in section 7.2. The interviews lasted from 30 to 60 minutes and were conducted at a time convenient for each participant. Of the 20 interviews, nine were conducted in English.

At the start of each interview the researcher initiated a general conversation to build rapport and encourage the interviewee to share experiences and knowledge. Each participant was given a brief overview of purpose of the interview and asked to sign a consent form (Appendix G) which detailed information about the study's purpose, what role the interviewee would take, and the right to stop recording the interview or withdraw from participation at any time. All consent forms have been stored in a locked, secure cabinet at Curtin University.

To minimise the possibility of misunderstanding due to language, a copy of the interview schedule and a list of terms and definitions were given to each participant. There was an opportunity to clarify anything ambiguous before starting the interview. With the permission of participants, interviews were recorded on a digital voice recorder; all recorded files were then transferred and stored in a password-protected folder on the researcher's computer at Curtin University.

Throughout the interviews the researcher remained mindful of the effect of language. The meanings of words or phrases used were clarified when required. Where necessary, the researcher restated participants' answers to confirm, clarify and understand their meaning accurately. At the end of each interview the researcher asked a number of background questions (e.g., specialty, qualifications and years of work experience in the study sites). Participants were then thanked for their input.

7.6 Data Analysis

To ensure anonymity, prior to the interviews all participants were assigned an ID code consisting of two parts. The first part indicated the professional status of the interviewee (N for nurses and P for physicians); the second indicated the interview's number within that group. For instance, N1 corresponded to the first interview among nurses. Only ID codes were used during data analysis, and all names mentioned during the recorded interviews were deleted.

A number of different methods can be utilised for analysing qualitative data. For the purpose of this study, inductive thematic analysis as described by Braun and Clarke (2006) was chosen. This method uses data to drive thematic analysis from which codes are generated, without trying to fit the data into an existing framework. It allows themes to be identified without prior assumptions about what topics might emerge. The stages of thematic analysis adopted for use in this study are shown in Figure 7.1, and a description of each stage is presented in the next following sections.

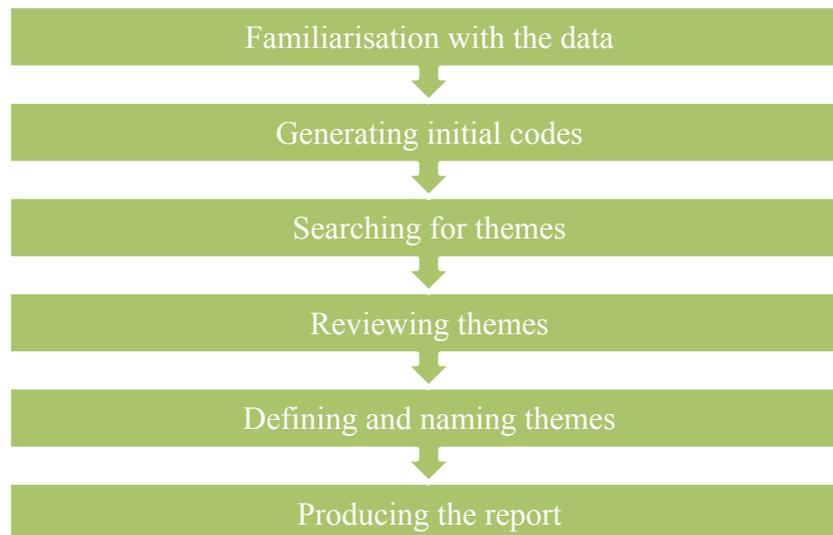


Figure 7.1: Stages of thematic analysis

The first stage was to become familiar with the data. In this stage, the researcher listened to all the recorded interviews a number of times. All interviews were then transcribed using Microsoft Word 2010. Transcribed texts were compared with the audio files to ensure the accuracy of the transcription. Interviews conducted in Arabic were first transcribed into Arabic. Because of the time and effort required

for the translation of all Arabic texts, a selective translation process was made. The researcher listened to Arabic interviews and re-read all the Arabic transcriptions a number of times to identify and abstract those segments of text which matched inferences that had developed from the quantitative analysis in phase one. The extracted portions were then translated into English. Reverse translation was undertaken to ensure that English and Arabic text segments had the same meaning. It was a challenge to listen, transcribe and translate interviews into two different languages, but during this process the researcher became very familiar with the data and ensured that confidentiality was maintained.

The second stage was producing codes from the raw data, keeping in mind the purpose of the second phase: to find why there were differences in physicians' and nurses' attitudes toward patient safety. In order to produce codes, the researcher read and re-read the transcribed texts many times. Text segments that were interesting and related to the inferences drawn in phase one were coded, and groups of relevant segments were collated. The coding process was facilitated using the qualitative data analysis software programme QSR NVivo 8.

The third stage of the analysis was sorting and collating all relevant codes into potential themes. Braun and Clarke (2006) have indicated that themes capture important aspects within data sets in relation to the research questions. In this stage the researcher commenced by analysing codes and combining them into potential themes. Some codes did not fit with any identified themes and had insufficient supporting evidence within the dataset to develop into additional themes; however, when reviewing these the researcher concluded that they were essential to developing a full understanding of the inferences drawn in phase one, and they were retained in the data analysis and interpretation.

At this stage of analysis, mind maps were used alongside QSR NVivo. This technique helped the researcher to visualise codes and sort them into themes; it also assisted in identifying interrelationships.

The fourth stage of analysis was a review to identify whether emergent themes needed revision, refinement or rejection. Two reviews were undertaken, as described by Braun and Clarke (2006). First all extracted data relevant to a theme were studied to see if any coherent patterns formed; then all transcribed texts were re-read to code any missed data that could be aligned to the themes. Some existing themes were absorbed into others. At the end of this stage a final thematic map was generated.

The fifth stage of analysis was to name and define the final themes. At this stage all extracted data were studied to identify what was of interest and its relationship to the inferences drawn in phase one. Theme names were defined and a final list produced.

Producing the study report was the last stage of analysis. The themes and sub-themes that emerged were presented, supported by relevant comments from participants that illustrated and demonstrated differences in opinions. False starts, hesitations, repetitions and incomplete statements were deleted, and grammatical errors were corrected to provide a readable text without modifying the intended meaning. In the following chapter, this stage will be discussed in more detail by presenting themes with supporting quotations from the data.

7.7 Validation of Qualitative Data

There are a number of techniques used to establish the validity of qualitative research (Creswell, 2013; Creswell & Miller, 2000; Guba, 1981; Hansen, 2006; Shenton, 2004). In this study its validity was established through purposive sampling. This strategy enabled the researcher to improve the quality of data by selecting individuals who would provide rich information about the study problem. Providing a brief summary of the interview to each participant “member checks” also helped to validate the data. This technique allowed participants to validate their answers and revise any misinterpretations. Peer debriefing was also used to establish validity. It was achieved as described by Shenton (2004), through discussion with the study’s supervisors who had extensive experience in qualitative research.

Reflexivity was another technique used to validate the collection and analysis of the qualitative data. This was achieved through detailed reflective writing about issues that might have influenced the data collection and analysis in phase two. Finally, validation of the data collection process and analysis was established through providing a detailed description of phase two of this study, including how access to the study sites was obtained, participants’ recruitment and data collection and analysis methods.

7.8 Summary

This chapter discussed phase two of this study. This included the recruitment of participants and data collection, and the process involved in analysing the data. A

purposive sampling technique was used to recruit participants. An individual semi-structured interview process was adopted for data collection, in either English or Arabic, according to participants' preferences. Analysis was undertaken utilising inductive thematic analysis as described by Braun and Clarke (2006). The final themes identified within the data will be presented and discussed in the next chapter.

Chapter 8: Qualitative Phase Results

8.1 Introduction

The purpose of this study is to explore physicians' and nurses' attitudes toward patient safety using a sequential explanatory mixed methods design. In the previous chapter the data collection and analysis methods for the qualitative phase of the study were described. This chapter presents the findings from this phase. The characteristics of interview participants are explained and the findings are then presented in two sections: the main themes and sub-themes that emerged to explain why physicians and nurses had discrepant attitudes toward patient safety, and the themes that developed from participants' answers to the extra question, related to the impact of workforce diversity on patient safety.

8.2 Participants' Characteristics

The participants represented ten nationalities. Years of work experience ranged from one to 25 years. One of the participants was a medical director and another was a nursing director. Job categories varied between participants (see Table 8.1).

Table 8.1: Characteristics of interviewees

Job Category	No	Gender	No	Nationality	No	Years of work experience	No
Consultant	5	Male	8	Saudi Arabia	6	1–5	7
Specialists	3	Female	12	Jordan	2	6–10	4
General Practitioner	1			Egypt	1	11–15	5
Head Nurse	6			Syria	2	16–20	1
Staff nurse	5			Philippines	3	> 20	2
				India	1		
				Australia	1		
				America	1		
				Malaysia	1		
				Korea	1		
				South Africa	1		

8.3 Differences Between Physicians' and Nurses' Attitudes

The purpose of phase two was to explain why physicians and nurses had discrepant attitudes toward patient safety. Following data analysis, five themes and 15 sub-themes emerged. Table 8.2 displays the main themes and sub-themes. In the subsequent sections, themes and sub-themes are presented.

Table 8.2: Themes and sub-themes emerging in phase two

Theme	Sub-theme
Workforce characteristics	Country and culture
	Gender
	Job status
Management practices	Managerial support
	Communication with management
	Power and instability of management
	Lack of appreciation
Professional culture	Team working
	Role and responsibilities
	Staff expectations
Patient safety practices	Staff compliance
	Reporting incidents
Work environment	Inadequate resources
	Working hours
	Staff development

8.3.1 Workforce characteristics.

Following data analysis, workforce characteristics emerged in the interviews as a consistent theme. This was demonstrated in three aspects, including country and culture, gender, and job status.

8.3.1.1 Culture and country.

When participants were asked to explain why physicians and nurses had discrepant attitudes toward patient safety, some issues related to culture and country emerged. Some participants believed that the cultural background of physicians and nurses and their country of origin played an important role in shaping their attitudes toward patient safety. One nurse commented, “country and culture have got a lot to do with it” (N1).

In the study sites, many health care workers were expatriates, from different countries with different cultural backgrounds. Most nurses were from the Philippines and India. Unlike nurses, most physicians were from Arabic countries; almost half were Saudis. In general nurses felt that they were privileged to work in Saudi Arabia, as they received a good income. One nurse said, “I think nurses are mainly far Easterners and they feel privileged to be here, they feel privileged to be receiving a

salary whereas the physicians are mainly Arabic” (N5). Another nurse commented, “It’s a good chance for them [nurses] to have a good salary in this hospital” (N9).

While expatriate nurses felt that they were privileged to work in Saudi Arabia, some were apprehensive about expressing any dissatisfaction for fear their contracts might be terminated. One nurse commented, “We are foreigners, how can we say that we are so tired, if you are tired, they [hospital management] will say pack your bags and go” (N10).

Nurses also felt that being expatriates tightened the bond between nursing staff. One nurse said,

We are coming from different countries, from different backgrounds, from different cultures, we are new, in a new country and in a new culture, so we need to be as family in one place because we do not have our family here, we do not have our close people here, so I think there is a tight bond between nursing staff. (N1)

Participants perceived that culture was a barrier for incident reporting, in particular among Saudi staff, because they did not want to upset others by reporting incidents. One nurse said, “it is also a culture issue here in Saudi Arabia, it is especially among Saudis, we do not want to upset somebody, but sorry we’ve got to report [incidents]” (N6). Participants also perceived that social and family commitments influenced attitudes toward patient safety. One nurse noted that Saudi or Arabic physicians had more commitments than nurses, particularly outside the work environment: “the majority of nurses are foreigners and that means they do not have commitment as physicians, most of the physicians are Arab or Saudi, and they have more commitment [social and family commitment], a lot of things”. (N4)

8.3.1.2 Gender.

Gender emerged as another reason why differences existed between physicians’ and nurses’ attitudes. In the study sites, females made up more than 90% of the nursing workforce, while males were dominant in the physicians’ workforce. Some interviewee nurses felt that females were more positive than males. One nurse commented, “[nurses] mostly are females, and maybe this is the reason they take things more positively” (N4).

Another nurse also commented, “because women are more positive than men, the workforce is women in nursing more than men” (N5). The same nurse commented that females were more used to coping with stressful environments. Despite most of the nurses working on a single based contract (i.e., not with their family), this nurse compared the ability of nurses to cope with stressful environments to women’s ability to juggle family and work commitments:

they are women, so they got on with these, women got on with these things ... the majority of women can get on with things, they have 5, 6, 7, 8 children, they have a job, they are going to work, they come in, they get to prepare the meals, they are more used to that sort of environment, whereas the majority of the physicians are males, male dominant, their perception is different from females, they cannot put up with this much. (N5)

There was also a perception among female nurses that females were more likely to work as a team and support each other. One stated, “of course teamwork is more with females than males and they love this, they depend on each other, she feels more confidence if she has someone with her, to support her” (N4). Another nurse commented,

of course women together we always find teamwork, women together we’re always fine. In medical staff, you have to realise you have females and males working together, nurses are mostly all females working together. (N1)

8.3.1.3 Job status (military, civilian).

Unlike nurses who were mostly civilian personnel, physicians were classified as military or civilian based on their job status. Some participants felt that the two-job status of physicians explained why physicians and nurses had discrepant attitudes toward patient safety. They felt that differences in physicians’ status contributed to the low levels of teamwork observed in medical departments. Comments included:

In nursing, we do not have to worry about military, I think that is another factor among the physicians, some of them are military, some of them are not. (N6)

There are levels or segments for the job, I think this has an impact while for nurses these levels do not exist that much. (P9)

The theme of workforce characteristics and its sub-themes suggest that physicians' and nurses' characteristics such as culture and country, gender and job status (military or civilian) might be areas of interest that explain discrepancies between their attitudes toward patient safety. Although most nurses were expatriates and felt privileged to work in Saudi Arabia, the findings suggest there was a feeling by a number of participants that being expatriates might discourage nurses from expressing their feelings if they were exhausted or tired due to a fear of having their contract terminated. The findings also suggest that social and family commitments influence physicians' and nurses' attitudes toward patient safety. Unlike nurses, most physicians who worked in the study sites were Saudis or Arabic with more social and family commitments than nurses. The findings further suggest that culture was a barrier for incident reporting, in particular among Saudi staff, because they did not want to upset others by reporting incidents. Gender was seen to influence nurses' attitudes to working as a team, and influences their ability to adjust to a stressful environment. There was a feeling by number of participants that the dual job status in the medical department explained why physicians and nurses had discrepant attitudes toward patient safety in the study sites.

8.3.2 Management practices.

In Saudi Armed Forces hospitals, medical and nursing departments are distinct departments operated by different management. Following data analysis, management practices emerged in the interviews as a consistent theme, demonstrated through four aspects including managerial support, communication with management, the power and instability of management, and lack of appreciation.

8.3.2.1 Managerial support.

Managerial support emerged as a theme explaining why physicians and nurses had discrepant attitudes toward patient safety. Most participants believed that nurses had good managerial support, a view demonstrated by several participants' comments:

We do have the support, we do get the help, we get listened to. (N1)

They [nurses] have very good support, they are more supported. (P9)

In contrast with nurses, some participants felt that physicians did not receive much support. One nurse commented, “I think the physicians do not get as much support” (N5). When physicians experienced problems, as one physician commented, “if someone complained about anything, you would find only a few departments stand by the physicians” (P2). In support of this view, one physician provided a personal experience as an example of lack of managerial support:

She [female patient] raised a complaint against me to the MSD [Medical Services Department]; I was unable to travel for two and a half years without any reason. I did not do anything wrong, I was following what is written in the memo issued from the department. No one stood beside me, no one said we support you, we stand beside you or anything. (P7)

8.3.2.2 *Communication with management.*

Communication with management was another theme that emerged during interviews. Unlike physicians, who felt that their relationship with management was not strong or that sometimes “there is no relationship [between management and physicians], the relationship is not strong enough” (P1), nurses believed that they had a good relationship with management. Nurses felt that they could communicate with management and report problems without restriction. In addition, nurses believed that management provided all necessary information for them to do their work. Comments included:

There is no gap between us and the management, their doors are open for all. When you have any concerns, it is normal for them, they do not have a problem with that. (N9)

Our leader gives effective communication to us, she brings the news, she tells us what we are supposed to do and things are communicated. (N8)

She [head of the nursing department] is very open, anytime I can approach, and this is why I am satisfied. (N11)

Unlike communication between nurses and management, one nurse indicated that there was a communication breakdown between physicians and management. She provided as an example that relevant issues related to the implementation of JCI standards for hospital accreditation were not communicated to them:

I think communication breakdown, things are not relating to them accordingly. I can give you a very good example, now we are going to JCI, most of the things which have been communicated to us, to be implemented, the physicians are not aware of. (N8)

8.3.2.3 Power and instability of management.

Some participants felt that differences in managerial power and organisation of work were reasons for why differences existed between physicians' and nurses' attitudes toward patient safety. Some physicians believed that the management of the nursing department had more power more than the medical department. Comments included:

Nursing in any hospital in the world is more powerful than medical administration. (P7)

The nursing administration is very strong ... nursing whatever they want ... most of the things they want they get, while most of what we [physicians] want we do not get. (P9)

In addition, nurses had well-organised management, which was better than the medical administration. One physician commented, "I think that the nursing management is always organised and better than medical administration' that is clear" (P2).

Some felt that instability of management was a reason why physicians and nurses had discrepant attitudes. In the study sites, management in the medical department had changed several times over the last few years. This issue was addressed by participants:

The medical administration has changed a little bit over the past two years or so, has changed directors and first people. (N1)

The medical administration, they are always changing. When the new person is put into the position, it lasts maybe for a year or so. (N10)

8.3.2.4 Lack of appreciation.

Lack of appreciation emerged as another factor explaining discrepant attitudes between physicians and nurses. Some physicians felt there was a lack of appreciation

of them from management. One stated, “there is a lack of appreciation or let’s say less appreciation than what the physician deserves.” (P9).

These findings suggest that management practices contributed to physicians’ and nurses’ discrepant attitudes toward patient safety. This theme and its sub-themes indicate that nurses have good managerial support and an effective communication process with nursing management. In comparison, physicians had a weak relationship with management and felt underappreciated. Unlike nursing management, which was considered stronger and more organised, medical management had changed numerous times in a few years.

8.3.3 Professional culture.

When participants were asked to explain why differences existed in physicians’ and nurses’ attitudes toward patient safety, several factors relating to the professional culture emerged: team working, roles and responsibilities, and staff expectations.

8.3.3.1 Team working.

Participants indicated that nurses were more likely to work as a team while physicians worked independently. Comments included:

Nurses work as a team. (N3)

We [physicians] do not work as a team. (P6)

Nurses believed that they “have good teamwork” (N8), and relied on each other to perform their duties. One nurse indicated that nurses could not do their work without the help of other team members, whereas physicians worked independently: “I think physicians are more independent than nurses, for us, it is really important, that teamwork—I cannot work alone without anybody’s help” (N11).

Participants believed that the similarity of nursing roles and regular co-location made nurses more likely to work as a team, unlike physicians who had many specialities and worked in different areas:

I think the similarity and the unity of the work between nurses, all of them are one unit, and there are no differences between them while physicians are different. (P2)

There is no difference in their specialities. A nurse is a nurse while physicians come from different disciplines. (P3)

In the ward, we are nurses most of the time, we are just in one area unlike the physicians. They sometimes [work] in different areas. (N3)

We [nurses] have this culture of unity. (N7)

In addition, shared patient responsibility predisposed nurses to work as a team. As one physician said, “I am as a physician—for example I have a patient—all the time I am responsible for this patient while the nurse, when she goes home, another nurse will take over her responsibility” (P1).

Some participants believed that communication and collaboration among physicians was less than optimal: “communication or collaboration between physicians, it should be there but it is below the level that should be” (P3). Some felt that competition among physicians hindered teamwork:

I think with the physicians there might be some competition, this physician thinks his way is the right way, this physician thinks no I learned it in this way. (N6)

Definitely there is no teamwork, I do not know why, I think there is some kind of competition. (P5)

Despite the previous indications that nurses were more likely to work as a team while physicians worked independently, most participants felt that physicians and nurses worked together as a productive team, particularly when it came to patient care. One nurse commented, “when you talk about patient care and teamwork during care, there is a good teamwork with the physicians” (N2).

8.3.3.2 Roles and responsibilities.

Roles and responsibilities emerged as more reasons why differences existed between physicians’ and nurses’ attitudes toward patient safety. Physicians believed that they and nurses had different responsibilities: “each of them has a different responsibility” (P2).

Physicians viewed themselves as decision makers and nurses as followers. One physician stated, “He [the physician] is the decision maker. Nurse, she follows what

the physician wrote for her, but physician, he is the one who decides” (P1). Another physician said, “She [nurse] applies the physician’s decision” (P6). Physicians felt that the responsibilities of nurses were limited to taking care of patients and implementing medical interventions or the therapeutic side of treatment, and informing physicians about a patient’s condition and the progress of treatment while “the effectiveness of either treatment or any complications is still the physician’s responsibility” (P3):

Her duty [nurse] is to take care of the patient. (P2)

The nurse is responsible for the implementation of the therapeutic side. (P3)

In the system of this hospital, the responsibility of nursing is only to inform the physician. (P4)

On the other hand, nurses believed that “the care of the patient is entrusted to the nurse” (N7). They commented that working at the bedside of the patient made them more accountable than physicians for the safety of the patient:

Only because they have more to do with the patient at the bedside, the nurses are dealing with the patient and the nurses are held accountable for the patient’s falls, not the physicians; they [nurses] are much more accountable for patient safety. (N5)

Once the patient is under their care they [nurses] are responsible for that, they have to have a commitment and they have to ensure that the patient is in a safe environment. (N6)

Nurses believed that “physicians are not directly involved in care” (N2), and commented that physicians see the patients for a short time and once they give instructions for treatment they leave. One nurse said, “the physicians would come, visit and then order their treatment and go” (N5). In support of the view that nurses were more directly involved with patients, physicians also believed that differences in patient safety attitudes between them and nurses were also related to direct contact with the patient. One physician commented, “the nurse has direct contact with the patient” (P8). Another said, “it is right that we [physicians] care for the patient, but the nurse is still close to the patient” (P6).

8.3.3.3 *Staff expectations.*

Staff expectations of their hospitals emerged as another reason why physicians and nurses had discrepant attitudes toward patient safety. Some participants believed that physicians' expectations were higher than nurses'. One commented, "the nurse's expectations are not like the physician's expectations" (P9); and another, "their expectations are less than physicians" (P7). In support of this view, one nurse said, "I think their expectation is lower than the physicians' expectation" (N5).

For some participants, physicians' expectations were more likely to be professional, related to equipment and the availability of technology, whereas nurses' expectations were more personal, such as income level:

They [nurses] have specific requirements, often their requirements are financial requirements rather than equipment. Honestly their requirement is financially more. (P6)

Physicians expect from the management more, whether it is related to equipment or manpower ... Indian or Filipino nurses, their expectations are limited, they came to work here, and they have a certain number [salary]. (P7).

In support of the view that nurses' expectations were more likely to revolve around financial requirements, some nurses indicated that salary was the main reason why they were satisfied with their employment at the study sites: "of course first is the salary, it is definitely the salary—that's why we're here" (N8). Another nurse commented, "a lot of them they have left their country because the money is not good, so they come to a country like this, the money is better, so that's already for them a thankful thing" (N5).

The met expectations of physicians and nurses influenced their attitudes to work, and consequently to patient safety. Some participants felt that physicians were less satisfied with their employment because their expectations were not met:

Some of their demands are not met, certain demands are not met; maybe that's why they [physicians] are not satisfied. (N2)

Maybe the physician's expectation was that he would like to do something, but he cannot do it. I think the issue of not achieving your goal will reflect on you. (P8)

The findings suggest that professional culture influenced physicians' and nurses' attitudes toward patient safety. This theme and its sub-themes suggest that nurses were more likely to work as a team. Unlike nurses, physicians tended to work independently. The findings also suggest there was a lack of understanding in both groups of each other's roles and their importance in the delivery of safe, high quality care. Physicians viewed themselves as decision makers and nurses as followers. In contrast, nurses believed that they were more accountable for the safe care of patients, as they were more directly involved with the patients than physicians were. The findings also suggest that physicians and nurses had different expectations of their employment. Met physicians' and nurses' expectations influenced their attitudes toward job satisfaction and consequently patient safety.

8.3.4 Patient safety practices.

Patient safety practices emerged as another theme to explain why differences existed between physicians' and nurses' attitudes toward patient safety. This theme was demonstrated through two sub-themes, staff compliance and reporting incidents.

8.3.4.1 Staff compliance.

Staff compliance emerged as another reason for why differences existed between physicians' and nurses' attitudes toward patient safety. Most participants felt that nurses were more compliant with rules and guidelines, such as policies and procedures, than physicians:

The nurse is more committed to follow policies and procedures than physicians. (N9)

Nurses are more likely to follow policy and procedures, but sometimes physicians don't care. (N11)

Nurses' compliance with recommendations and guidelines is almost 100%, more or much more than physicians'. (P9)

Participants gave the example of hand washing to describe physicians' non-compliance. One nurse commented, "they never wash their hands. When we went for rounds, I said 'okay, physician before touching the next patient please use your hand drops'; we are the ones who will interfere and say please use the hand drop" (N8).

Others explained the difference by referring to the comprehensive orientation given to nurses upon employment commencement:

We have policies and procedures, we give nurses instructions, we educate and train them even how to fill the forms and when to report, and to whom to report. Physicians in the other side, I doubt if they have any orientation or instructions about policies, procedures. (N4)

When the nurse first came to work, she received a good orientation. They [Nursing department] provided her with ... these are our policies and procedures, you have to read it, and then they discussed that with her. (P7)

Nurses' compliance with rules and guidelines also referred to strict enforcement and follow-up by their management. One nurse stated, "we are strictly enforced to follow policies and procedures regarding patient safety" (N7). A physician also commented, "they have more follow-up from their management more than physicians" (P2).

Nurses believed that the non-compliance of physicians was exacerbated by their resistance to change, claiming nurses adapted more easily. One nurse said, "if there is a new change, anything, nurses will accept it. Some of the physicians, they will have resistance" (N4). Another nurse supported this statement: "nurses can easily adjust to changes, all of them will go with the flow and adjust with changes. For the physicians, yes, the resistance will be really happening" (N7).

Resistance to adopting JCI standards for hospital accreditation was given as an example by some participants of physicians' resistance to change. One nurse stated, "they [physicians] negatively resist the change especially in our aim for JCI accreditation" (N7). Another said, "there are some physicians complaining why we didn't put the patient name on the name board, we nurses said this is the JCI standard. They're still insisting, I want to see the patients' names on the board" (N11).

8.3.4.2 Reporting incidents.

Nurses were more likely than physicians to report incidents: "I think nurses had to do more incident reports than physicians" (N2). One nurse stated, "we are more into that [reporting incidents] than the physicians' side" (N7). Most nurses felt that the safety culture in nursing was non-punitive, as their management had worked

hard to change the safety culture. In addition, they indicated that they were supported and encouraged by their superiors to report incidents, and were rewarded for doing so:

They are trying to change the culture into a non-punitive one, and more nurses are reporting, it is much better than before. We even won—I think the ER department—they won the best, the most incident reporting. (N10)

They really support us, they are in the same stage, my assistant director of nursing, my director of nursing, they are encouraging us ... that's why we're trying to put in more incident reports. (N8)

Some nurses believed that physicians were less likely to report incidents for fear of recrimination or loss of trust in their abilities, and the potential impact on their reputation:

The physicians, they feel threatened, they still see it as punitive, they are being punished if they say incident report, they don't see it as something that can progress and improve. (N1)

The physician may be scared of being in trouble and therefore he is less into reporting. (P4)

I think the physicians have this problem if he makes an incident or anything, he will lose the trust of others, he may well be removed from his position or hold more accountable, his accountability will be more than nurses', and also reputation more than nurses' (N4).

Patient safety practices influenced physicians' and nurses' attitudes toward patient safety. This theme and its sub-themes suggest that nurses were more likely to follow rules and guidelines such as policies and procedures than physicians. Moreover, nurses were more likely to report incidents; most felt that the safety culture in nursing was non-punitive, and they were supported and encouraged by their superiors to report incidents, and were even rewarded for doing so. Unlike nurses, physicians were less likely to report incidents. Raising an incident report was seen as a slur against an individual, potentially resulting in punishment, and not as an

opportunity to learn. The impact on physicians' reputations and the loss of others' trust also influenced physicians' attitudes toward reporting incidents.

8.3.5 Work environment.

A number of issues related to the work environment were outlined by participants. These included inadequate resources (i.e., staffing levels and lack of equipment), working hours, and staff development (i.e., training and education, and orientation of new staff).

8.3.5.1 Inadequate resources.

Inadequate resources, such as insufficient levels of staffing, were highlighted in interviews. Participants considered existing staffing levels inadequate, in particular the physicians:

What I know is lack of staff for the physicians. (N11)

We have a shortage of physicians. (P7)

What I understand is that they [physicians] are having a shortage. (N2)

I think physicians are not enough. (N3)

Physicians felt they needed more staff, particularly in some specialities. As one physician said, "we have a shortage in some specialities, and I think we need how many years before we can say we have adequate staff" (P1). Because of the lack of staff, physicians were required to cover shortages in other specialities. This issue resulted in overlapping responsibilities:

Due to the lack of some specialities in the hospital, the physicians feel that they have a kind of overlapping in responsibilities as specialists. If you have a shortage in a specific specialty, you can see another physician from a different specialty covers that. (P4)

The nurses who participated in the interviews also believed that they had insufficient levels of staffing: "we are having shortages of staff" (N2); but they felt it did not affect them as much as the physicians. Some nurses indicated that there was a system that helped them to cover shortages:

We have a floating system whereby if we need six nurses and we only have five, the supervisor, by the end of the day and before the next shift, will try to get a float [nurse] from other wards. (N10)

Inadequate resources, such as lack of equipment also emerged in interviews. For most participants, this issue explained why physicians and nurses had discrepant attitudes toward patient safety. Most participants believed that medical equipment in the hospitals was insufficient: “there is a shortage in some equipment” (P6).

Physicians believed that the lack of equipment limited their work. One physician commented, “the unavailability of this equipment limits physician’s work” (P2). Some physicians believed that the lack of equipment affected their work more than nurses: “Of course, I am the one who is going to be affected, and be frustrated because I do not have the equipment. Nurses, it does not make any difference with them” (P9). Physicians believed that “the unavailability of this equipment puts more pressure on physicians, and this makes them more dissatisfied because they cannot be able to do a proper diagnosis” (P3).

The view that lack of equipment puts more pressure on physicians was supported by one of the nurses when she commented that when patients were referred to other hospitals because of lack of equipment, physicians took some time to decide the plan of treatment:

In this hospital there are also shortages in equipment, it is not completed, I mean, like MRI we are referring patients to another hospital to do it, so the physicians will sometimes take time to decide what is the plan for the patient. (N3)

8.3.5.2 Working hours.

Working hours were another issue identified in interviews. Most participants believed that working hours explained discrepancies between physicians and nurses in their attitudes toward patient safety. They indicated that physicians worked longer hours than nurses, sometimes for more than twenty-four hours, particularly if on call, sometimes followed by another full shift:

They [physicians] are working for how many hours more than the nurses, I think for 24 hours sometimes, we see them here probably most of the time. (N3)

The physician covers twenty-four hours, on-call, and work the next day. He covers thirty-six hours. (P6)

Most participants indicated that nurses worked twelve-hour shifts with a break before the next shift. One physician said, “The nurse ... she has 12 working hours, and then she goes home and rests for 12 hours” (P1). Nurses also indicated that they worked for three days on shift with a break of one or two days before starting the next round of duty. One nurse commented, “we have 12 hours to finish our work, then work the following day, maximum three days straight work, and then we will have a rest, two or one day off and then another duty” (N11).

Unlike nurses who had fixed shifts for working, physicians felt that they did not have regular working hours:

The physician does not have a specific time for work, like what you said shifts, start from and end at specific time, nurses work from this hour to that hour and then finish work. (P2)

8.3.5.3 Staff development.

Another issue identified in interviews was staff development. Most participants raised several issues related to staff development in the hospital, including staff training and education, the orientation of new staff, and staff attendance. Most of the nurses who were interviewed indicated that they received adequate training in the hospitals. As one nurse said, “nurses have strong training, regular training, we have a special educational calendar, sessions every month, every week, to meet our needs whether education, skills—everything” (N4). Nurses felt they had better opportunities for training and education than physicians. As one commented, “I think education is good for nurses, the opportunity is much, much better for nurses than physicians” (N5).

One physician felt that nurses received more training opportunities because they were in direct contact with patients and thus the potential for errors to occur was greater. “I think that nursing is better than us, in terms of training because they have direct contact with the patients, any errors will be happening from their side, so they work well on education more than physicians” (P8).

The interviewed physicians indicated that they did not have training courses in the study sites. “In fact, we do not have a training programme for physicians” (P1).

Some proposed this was because the hospital was not classified as a training or academic hospital. Moreover, the training of physicians was more likely to occur through practical experience:

Our hospital is not training or academic hospital. (P8)

Our training is almost through the actual work, not through training sessions. (P4)

Another issue related to staff development was the hospital's training and education policy. Unlike physicians, this policy did not limit nurses' training and education. One nurse commented, "I think you have to be Saudi to get education leave or something like that, so I think that makes the physicians unhappy, for nurses we will still continue to go" (N6).

The feeling that the hospital's training and education policy did not support physicians was strong among physicians, who pointed out that they were supported only by few days leave although they were required to undergo continuous education which had to be self-funded:

They [physicians] are supported only by few days but at the end they have to sponsor themselves. (P9)

As a physician, I have to be up-to-date in my knowledge, I need to go to conferences, I have to pay the fees of all these conferences. (P7)

There were some training courses conducted in the hospitals, and staff attendance emerged as another issue related to staff development. Some nurses indicated that physicians were less likely to attend the training and education courses offered by the hospital:

From my understanding here the physicians are supposed to attend a weekly session, I think it's now Wednesday morning. Do physicians show up?— for show-up they sign their name and leave. (N6)

One nurse described attendance at the JCI training courses as an example: "only a few physicians attended, most of the attendance was from the nursing side, only a few from other departments, as well physicians" (N7). When physicians were asked about their low attendance at training courses, their workload was cited as a

reason. One physician said, “Maybe because physicians are busy; for example, I tried to set the time at 10 o’clock to attend the lecture, which was on Sunday, but I could not, I had work to do, I could not go” (P8).

Orientation of new staff was another issue related to staff development. Most participants believed that nurses received good orientation prior to commencing working at the hospitals. As one nurse said, “they [nurses] have a good orientation” (N6). Two orientation programmes had been established for new nurses: “we have two programmes, one programme for new staff who have experience but they are new in the region, they have a one month orientation programme; we have also another programme, six months, for new staff who do not have experience” (N4). During orientation, nurses learned about the hospital and its policies and procedures as well as stress management techniques. Nurses also received basic Arabic language training to enable them to communicate with patients:

We [nursing] assign a preceptor or mentor to them [new nurses] to orient them about the places, skills, policies, and procedures, everything. (N4)

As part of our orientation programme we [nurses] have this topic about stress management, how to deal with the stress, so we learn how to adjust with all these stressors. (N7)

We [nurses] have in our orientation Arabic class, they give us the basic things that can make nurses able to communicate with patients. (N9)

In comparison with nurses, some participants indicated that physicians did not have a comprehensive orientation programme, and started work immediately from the first day:

The physicians don’t receive proper orientation. (N8)

The physician when he comes, they said this is your clinic, the patients come this way, and you are a physician, you know these tests, and these are the things we do, now start your work. (P7)

Work environment factors such as staffing levels and equipment supplies, working hours and staff development explained why physicians’ and nurses’ had discrepant attitudes toward patient safety. The findings suggest that staffing levels in

the study sites were inadequate. In particular, physicians seemed to be understaffed in some specialities. Lack of equipment was also an issue. Long working hours were an issue for physicians. Some physicians worked for more than 24 hours, in particular when they had on-call duties, while nurses worked for 12 hours.

The findings also indicate that nurses had a good orientation programme, unlike physicians who did not receive proper orientation prior to starting their employment. During nurses' orientation, they received all necessary information relating to their work such as skills, policies, and procedures, how to manage stress in their work environment, and the basics of Arabic language. Moreover, nurses received adequate training and education courses, unlike physicians who had limited opportunities for training and education.

8.4 Additional Findings

As mentioned earlier, participants were asked an additional question to understand the impact of workforce diversity on patient safety. Two themes emerged during the interviews: miscommunication caused by language barriers, and diversity of experience.

8.4.1 Miscommunication caused by language barriers.

Miscommunication emerged as negative impact of workforce diversity. Most participants felt that the language barrier was the main negative impact of having a diverse workforce, in particular when health care workers were non-Arabic speakers:

Communication will be the main thing because of the language barrier that we have. (N2)

Biggest thing is language barriers, the majority are not Arab speakers. (N4)

It may lead to miscommunication between patients and physicians or between nurses themselves. (P3)

If we do physician's rounds, the physicians are speaking Arabic and the nurses don't understand—huge communication problem. (N5)

For some participants, language barriers influenced clinical diagnosis. One physician noted, "if the physician or the nurse does not speak the same language of the patient, really it is a problem because it affects patient diagnosis" (P2). Another

physician said, “it could affect the diagnosis, if the physician does not understand what the patient said 100%, he will miss something” (P5).

Some participants felt that language barriers could influence patient satisfaction. One nurse commented, “once the patient knows that the nurse who takes care of him understands what he wants, he will be satisfied and he also will be satisfied about the services or the care delivered to him” (N4).

To combat communication problems, most nurses reported that they had attended basic Arabic language classes during their orientation. They felt that these sessions helped them communicate more effectively with patients. As one nurse said, “we [nurses] have in our orientation Arabic class, they give us the basic things that can make nurses able to communicate with patients” (N9)

Despite most participants acknowledging miscommunication as the main impact of workforce diversity on patient safety, many felt that they did not experience this issue in their hospital for a variety of reasons, including availability of interpreters and utilisation of Arabic staff as translators:

We have 24-hour interpreters and then we have Saudi nurses in the ward also, so they will help us. (N8)

We have interpreters, we have Arabic staff, and there are Saudi nurses and Saudi staff in each department. (P6)

For physicians, the vast majority of them are Arabic speakers and for those who do not speak Arabic, there are interpreters with them, so they can communicate with patients. (P7)

8.4.2 Diversity of experience

In this study, some participants believed that having a diverse workforce was beneficial for patient safety, with staff drawing on previous experiences in a variety of settings to contribute to best practice:

With many cultures, it is really positive because they work in different aspects of the world, they have different methods, different ideas. (N10)

These differences are in the interest of the patient because everyone will try to do the right things he or she knows, there will be kind of challenges, it is a good thing, and this will be reflected on the hospital in a positive way. (P1)

I think it is a positive thing, everyone will bring his or her own experiences, and at the end I am going to have the best. (P9)

Despite some participants indicating that having a multi-cultural workforce with different experiences might have a positive impact on patient safety, one nurse felt that it might have a negative impact depending on the levels of staff training and previous work standards:

It has a big effect on patient safety because of the training, if I came here from Australia, my standard is higher, much higher. My training, I am not saying my training is better, but my training is stricter, my standard is higher whereas the far Eastern standard is not as high and that does impact on patient safety. (N5)

Another nurse pointed out that conflict that could arise because of previous work practices. She felt that some staff insisted on following procedures from prior employment: “some people will still come this is how we did it there, the others want this, this how we did it there, and we do not get to common ground and say okay what are we going to do here” (N1).

Although some participants believed that workforce diversity might impact negatively on patient safety, others felt that with guidelines, policies and procedures in place, workforce diversity should not have any adverse impact:

It should not affect, because we have one policy, certain guidelines to follow and everybody has to adhere to that, so it should not. (N8)

I think it will not affect because you have guidelines and procedures that you follow. (P5)

8.5 Summary

The purpose of the qualitative phase of this study was to identify why physicians and nurses had discrepant attitudes toward patient safety. In this study, 20 participants were interviewed. Eleven were nurses, and nine were physicians. This chapter has presented the main themes and sub-themes that emerged from the interviews. From these it can be concluded that physicians’ and nurses’ attitudes were integrated elements of patient safety. Their attitudes were influenced by a number of factors, including their work environment, management practices, professional culture, patient safety practices and workforce characteristics. In the

next chapter, these findings will be discussed and integrated with the findings from the quantitative phase.

Chapter 9: Discussion

9.1 Introduction

The purpose of this sequential explanatory mixed methods study was to explore physicians' and nurses' attitudes toward patient safety in Armed Forces hospitals in Saudi Arabia. The quantitative and qualitative findings were presented in previous chapters; this chapter will summarise and discuss major findings of both phases in relation to the study objectives, which include: (1) identifying physicians' and nurses' attitudes toward factors that can have an impact on patient safety; (2) determining whether these attitudes are different between the two professional groups; (3) determining and evaluating the association between physicians' and nurses' attitudes and their identified personal characteristics; and (4) investigating the factors influencing patient safety culture in Saudi Armed Forces hospitals. In this chapter, the findings will be reflected upon in light of the literature, particularly that related to physicians' and nurses' attitudes toward patient safety.

9.2 Physicians' and Nurses' Attitudes Toward Patient Safety

Measuring health care workers' attitudes toward safety provides a general picture of the current state of safety culture (Flin, 2007; Sexton, Helmreich, et al., 2006; Sexton et al., 2004). In recent years a number of survey instruments have been developed to assess this. In the current study, the SAQ was utilised to measure attitudes toward six patient safety-related domains: teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions.

With the exceptions of job satisfaction and teamwork climate, findings from the SAQ revealed that less than half the physicians and nurses had favourable attitudes toward patient safety domains, in particular toward stress recognition and perceptions of management. These findings confirm previous reports that health care workers were likely to deny the effect of stress and fatigue on their performance (Flin, Yule, et al., 2006; Grant et al., 2006; Modak et al., 2007; Sexton et al., 2000; Zakari, 2011), and that physicians and nurses often demonstrated unfavourable attitudes toward management (Alayed et al., 2014; Grant et al., 2006; Huang et al., 2007; Zakari, 2011).

In an attempt to understand participants' attitudes toward patient safety domains in more detail, a comparison of physicians' and nurses' attitudes toward six patient safety domains was performed. This type of comparison enables health care leaders to identify weak areas in their institutions that influence physicians' and nurses' attitudes toward patient safety. The overall findings of the current study have provided additional support to the literature showing that physicians and nurses have discrepant attitudes toward patient safety (Grant et al., 2006; Huang et al., 2010; Huang et al., 2007; Makary, Sexton, Freischlag, Millman, et al., 2006; Modak et al., 2007; Parry et al., 2009; Poley et al., 2011; Sexton, Helmreich, et al., 2006; Sexton, Holzmüller, et al., 2006; Thomas et al., 2003; Zakari, 2011). Five out of the six patient safety domains, teamwork climate, safety climate, stress recognition, perceptions of management, and working conditions, varied significantly between physicians and nurses. The number of nurses with positive attitudes toward these domains was significantly higher than of physicians, with the exception of stress recognition, where the number of physicians with positive attitudes toward stress recognition was higher than of nurses.

The comparison of discrepancies between these and previous findings needs to be interpreted with some caution. As indicated in Chapter 3, there are mixed findings in the literature regarding physicians' and nurses' attitudes toward patient safety domains, in terms of which of these two professional groups has the most favourable attitudes in these domains. This may result from differences in the characteristics of the study sites or of the backgrounds of the study sample.

The findings reported in the current study represent the findings from Saudi Arabian Military hospitals, which are characterised by a unique multicultural workforce. Studies conducted in other countries and in some cases limited to a single professional group or clinical setting. Of the Saudi studies, the only two that had applied the SAQ were carried out in different health care settings (Alayed et al., 2014; Zakari, 2011). Alayed et al. (2014) explored ICU nurses' attitudes in six Saudi Arabian teaching hospitals, while Zakari (2011) explored nurses' attitudes toward patient safety in four ambulatory academic departments: medical, surgical, obstetrics/gynaecological and paediatric.

Despite its different parameters, the quantitative findings of the current study are generally consistent with research reporting that nurses have more positive attitudes toward the safety climate (Carayon et al., 2006; Grant et al., 2006; Nabhan

& Ahmed-Tawfik, 2007; Pronovost et al., 2003; Taher et al., 2014), perceptions of management (Modak et al., 2007; Poley et al., 2011), and working conditions (Grant et al., 2006; Poley et al., 2011). In addition, the discrepancy in stress recognition, in which physicians showed more positive attitudes than nurses, has confirmed studies showing that physicians acknowledged the influence of stress and fatigue on performance more than nurses (France et al., 2010; Grant et al., 2006; Huang et al., 2010; Huang et al., 2007; Poley et al., 2011; Speroff et al., 2010).

In relation to teamwork climate, the quantitative findings of the current study differ from studies that have reported that physicians often had more positive attitudes toward teamwork, and rated their collaboration and communication with nurses higher than nurses rated their collaboration and communication with physicians (Carney, West, et al., 2010; Chaboyer et al., 2013; France et al., 2010; Grant et al., 2006; Huang et al., 2010; Huang et al., 2007; Makary, Sexton, Freischlag, Holzmueller, et al., 2006; O'Leary, Ritter, et al., 2010; Poley et al., 2011; Profit et al., 2012a; Relihan et al., 2009; Sexton, Holzmueller, et al., 2006; Sexton et al., 2000; Speroff et al., 2010; Thomas et al., 2003). These differences in findings may be due to the unique characteristics of health care workforces in Saudi Armed Forces hospitals.

The nature of the discrepancies between physicians' and nurses' attitudes toward patient safety is still not fully understood. A few studies have provided possible explanations, including that different characteristics, such as status/authority, gender, training and patient care responsibilities might explain differences in attitudes (Carayon et al., 2006; Grant et al., 2006; Makary, Sexton, Freischlag, Holzmueller, et al., 2006; Sexton, Holzmueller, et al., 2006; Thomas et al., 2003).

In the current study, the overall findings suggest weak associations between physicians' and nurses' attitudes toward patient safety domains and some of their personal characteristics. Not all tested characteristics (job category, clinical area, years of experience in specialty, years of work experience, level of education, nationality and gender) influenced, or had a similar influence on, physicians' and nurses' attitudes. Several studies have shown that personal characteristics such as age (Aboshaiqah & Baker, 2013; Carney, Mills, et al., 2010; Hamdan, 2013; Pringle et al., 2009; Raftopoulos & Pavlakis, 2013), education (Haugen et al., 2010; Pringle et al., 2009), years of work experiences (Aboshaiqah & Baker, 2013; Bodur & Filiz,

2009; Poley et al., 2011; Raftopoulos & Pavlakis, 2013; Shaw et al., 2009), and gender (Aboshaiqah & Baker, 2013; Carney, Mills, et al., 2010) are associated with health care workers' attitudes toward patient safety, but none have provided details about the level or the strength of these associations.

The small value of the associations between the attitudes of physicians and nurses and their personal characteristics, as revealed in the current study, suggests that other factors might be at work. Thus, further investigation was carried out, by interviewing a purposive sample of physicians and nurses working in the study sites. The interviews raised a number of key themes, outlined in Figure 9.1 below, which reflected factors that influenced physicians' and nurses' attitudes toward patient safety. In the subsequent sections, these factors are discussed.

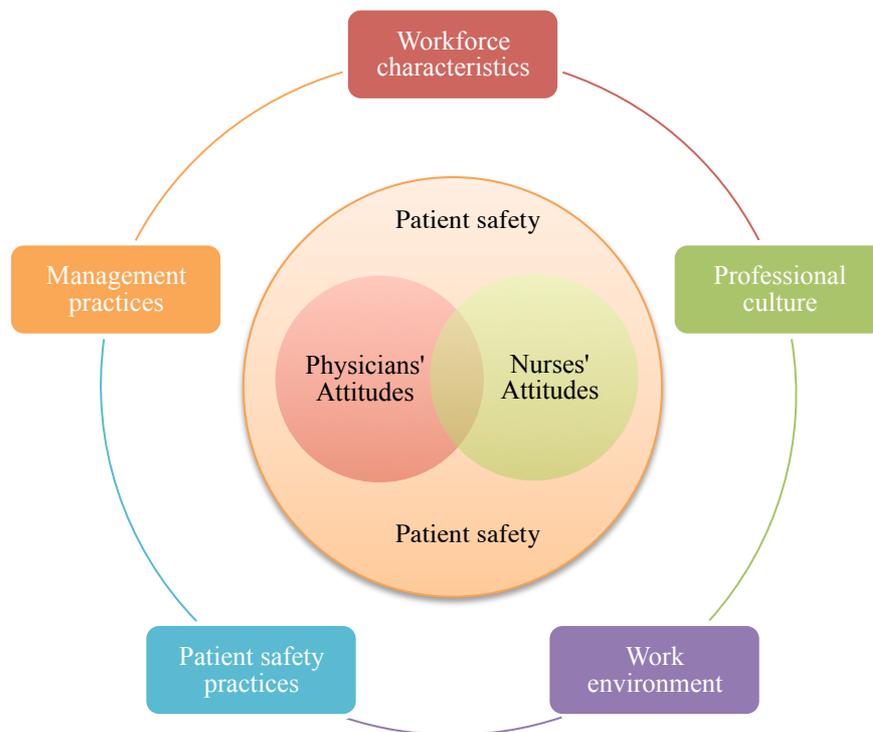


Figure 9.1: Factors influencing physicians' and nurses' attitudes to patient safety

9.2.1 Workforce characteristics.

This study's findings indicate that discrepancies in physicians and nurses' attitudes toward patient safety may be attributed to some personal characteristics such as cultural differences, gender and job status.

9.2.1.1 Culture and country.

Most of the nurses in the study sites were expatriates with different cultural backgrounds, and largely from Asian countries (the Philippines and India), whereas most of the physicians were from Arabic countries (i.e., Saudi Arabia and Egypt). Each country's culture shapes its members' attitudes and behaviours. To understand the consequences of national and cultural diversity, Hofstede (2001) identified a number of cross-cultural dimensions, including power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, and long- versus short-term orientation. These dimensions have been widely used to investigate the impact of cultural differences on individuals' attitudes.

The influence of cultural differences on physicians' and nurses' attitudes toward patient safety varied. Most physicians and nurses in the study sites were from high power distance cultures (Hofstede, 2001), in which individuals were less likely to question the decisions or actions of leaders, even if these were inappropriate (Helmreich, 1999). They were also less likely to speak up with concerns (Leonard, Graham, & Bonacum, 2004). In the current study, the influence of power distance was reflected in the reluctance of expatriate nurses to express dissatisfaction when they were tired, for fear their contracts might be terminated. It was also reflected in the reluctance of Saudi staff to report incidents because they did not want to upset others.

The influence of culture on health care workers' attitudes toward incident reporting has been highlighted in previous research. Sanghera, Franklin, and Dhillon (2007) explored health care workers' attitudes and beliefs about causes of and reporting of medication errors in a United Kingdom ICU, finding that culture was a barrier to reporting errors. One participant described the culture of reporting errors as "some kind of disease" (Sanghera et al., 2007, p. 59). The influence of cultural differences on the ability of health care workers to speak up was also highlighted by O'Daniel and Rosenstein (2008), who indicated that in some cultures it was very difficult for nurses to speak up when they observed an error. For example, the findings of Chen and Li (2010) indicated that Taiwanese health care workers were not likely to ask questions or say anything when they observed something going wrong.

The influence of cultural differences on physicians' and nurses' attitudes was also demonstrated in the finding that nurses were more likely than physicians to

work as a team. Other research has indicated that people with collectivist cultural traditions, such as Asian, Hispanic, and Black Americans, have more cooperative behaviours and work as groups more than those from individualistic cultural traditions (Cox, Lobel, & McLeod, 1991). Individuals from individualistic cultural countries were more concerned about themselves and their personal benefits (Helmreich, 1999), whereas individuals from collectivist cultural countries tended to be group-oriented, and concerned more for others (Xu, 2005). Even though most physicians were from collectivist cultural traditions, as were most nurses, the nurses' attitudes toward teamwork seemed to be more positive than the physicians'. This might be due to the nurses' feelings that being away from family increased the need to work as a team, and strengthened their bond.

The influence of cultural differences on physicians' and nurses' attitudes was also demonstrated in the finding that physicians had more commitment than nurses. In the study sites, unlike expatriate nurses who were working on a single based contract and mainly lived in accommodation provided by the hospital, most physicians were Saudis and Egyptians living with their families. In collectivist cultures such as those of Middle East countries, individuals placed emphasis on family and social commitment, and according to Hofstede (2001), had more obligations to their families, both financial and ritual. Family celebrations and milestones were very important. Having more social and family commitments added extra stress for physicians, as they were required to juggle these commitments with their job commitments, perhaps explaining why physicians were more likely than nurses to acknowledge the influence of stress and fatigue on their performance.

9.2.1.2 Gender.

Although the quantitative findings did not link gender with attitudes toward patient safety, the qualitative findings indicate that gender differences were a factor in discrepant attitudes toward patient safety. In health care, nurses are traditionally females and physicians are males, which was the case in this current study where more than 90% of the nursing workforce was female while the physicians' workforce was predominately male. The findings suggest that the gender of nurses could have contributed to their tendency to work in a team, and to their being less likely to recognise the influences of stress and fatigue on performance. Nurses indicated that

they could cope with stressful work environments better than physicians. This may be related to the coping skills used in caring for a family.

The influence of gender on patient safety attitudes of health care workers has been investigated in previous research. Aboshaiqah and Baker (2013) found significant differences in nurses' attitudes toward patient safety domains based on their gender, and that male nurses evaluated patient safety less positively than female nurses. They referred this difference "to culture itself, in that females are generally associated with caring behaviours" (Aboshaiqah and Baker, 2013, p. 278). Carney, Mills, et al. (2010), who explored gender difference in operating room staff attitudes toward patient safety, found that women had less favourable attitudes to teamwork, job satisfaction, management, and working conditions. They also reported that men were significantly more likely to have favourable attitudes to job satisfaction and working conditions. The discrepancy between the findings of the present study and Carney et al.'s study might be due to the fact that most of the female nurses working in Saudi Arabia are expatriates and work in a single based contract.

9.2.1.3 Job status (military, civilian).

The influence of workforce characteristics on physicians' and nurses' attitudes is reflected in the present findings that physicians had two job status (i.e., military or civilian personnel), but nurses were mostly civilian. The different job status in the medical department developed different subcultures, which might limit collaboration and communication among physicians. It emphasised seniority or hierarchy level between physicians, particularly among military personnel. The impact of hierarchal structures on collaboration and communication among health care workers has been discussed in other research. Thomas, Sherwood, Mulhollem, Sexton, and Helmreich (2004) indicated that it influenced how health care workers communicated with each other. Sutcliffe, Lewton, and Rosenthal (2004) also indicated that differences in status or power influenced openness and the quality of communication between different "levels" of physician. Communication failure in medical teams has also been related to hierarchical influences upon the degree of willingness of junior team members to communicate openly with senior staff (Reader, Flin, Mearns, & Cuthbertson, 2007).

9.2.2 Management practices.

In this study, management practices are indicated as a reason for physicians' and nurses' discrepant attitudes toward patient safety. In the study sites, medical and nursing departments were distinct, operated by different managements. The findings suggest that physicians' and nurses' attitudes toward patient safety were influenced by their management practices. Managerial support for health care workers has been identified as a key factor for a positive patient safety climate in hospitals (Walston et al., 2010). Hutchinson and Barach (2003) have indicated that senior hospital executives are required to be part of the health care team, with responsibility for providing a good environment, skilled workers, and equipment to ensure that patients receive safe, high quality care. In the current study, the influence of management practices was observed in the finding that nurses felt they received good managerial support, while physicians felt they did not receive sufficient support or any indication of appreciation from management. Nurses felt they had effective communication with management, and that in general things relating to their work that they needed to know were communicated to them; this was not the case for physicians.

In the study sites, the lack of managerial support for and appreciation of physicians could have serious implications for safety and quality of care. Kalantan, Al-Taweel, and Abdul (1998) indicated that lack of managerial support was one of the factors influencing physicians' job satisfaction and the quality of primary health care services in Saudi Arabia. Lack of appreciation may also influence physicians' performance and their satisfaction with a hospital, and consequently safety and quality of care. Being appreciated has been identified as one of the most fundamental human needs, which increases satisfaction and motivation (World Health Organization, 2012). When health care providers feel they are appreciated and recognised, they enjoy their work and accomplish their tasks more quickly and efficiently (Larsen, 1993). In the study sites, such practices could improve retention, particularly of non-military or non-Saudi physicians. It may be difficult for some physicians to cope with a military-style management, and they may seek opportunities in civilian hospitals.

In this study, stability of management related to differences in physicians' and nurses' attitudes toward management. The medical management had changed several times in the last few years. Unlike the heads of nursing departments, medical

directors in the Saudi Armed Forces hospitals are subject to deployment as directed by the hospital director and the Medical Services Department of the Armed Forces (MSD).

9.2.3 Professional culture.

In health care organisations each health profession has its own culture, which “defines the means for distributing power, determines how training should proceed within the clinical settings, and the level and the nature of inter-profession communication, resolution of conflicts and management of relationship between team members and constituents” (Pecukonis, Doyle, & Bliss, 2008, p. 417).

9.2.3.1 Team working.

The current study has indicated that professional culture also influenced physicians’ and nurses’ attitudes toward patient safety, reflected in the finding that nurses were more likely to work as a team whereas physicians worked independently. Having two different professional cultures can influence team-based working, and previous research has indicated that the existence of different professional cultures in health care can pose barriers to effective inter-professional teamwork (Hall, 2005; Khokher, Bourgeault, & Sainsaulieu, 2009; Krogstad, Hofoss, & Hjortdahl, 2004). Hall (2005) has suggested this could be due to educational experiences and socialisation processes during training. Physicians are mainly trained to work independently in a highly competitive environment, whereas nurses are trained to work as a team in a collaborative working environment (Hall, 2005).

In the current study, the findings suggest that competitiveness among physicians influences their attitudes to working as a team. Pecukonis et al. (2008) indicated that competition between physicians may also result from the construct of professionalism in medicine, which emphasises competition between health care providers rather than collaboration. In the study sites, not all physicians were educated or trained in the same medical school. Competitiveness between physicians may negatively influence the quality of their collaboration and communication, and subsequently the safety of care. Borrill et al. (2001) have indicated that competition in health care can undermine team-based work. Thomas et al. (2004) explored health care workers’ attitudes about working together in an NICU. Their findings identified

competitiveness as a personal attribute that influenced health care workers' attitudes about working together.

In this study, the findings have suggested that group unity, work area, and sharing the responsibility of care for patients influenced teamwork among physicians and nurses and may help to explain to why nurses were more likely than physicians to work as a team. In the hospitals where this study was conducted, unlike physicians who had different specialties, worked independently, and worked in different workplaces, nursing teams often worked in the same units, in the same workplaces, sharing the responsibility of care for patients. This finding is consistent with previous findings that nursing culture emphasises unity and teamwork by sharing responsibilities and outcomes with workers (Chiu, Pan, & Wei, 2008).

Teamwork is essential for ensuring the quality and safety of health care delivery (Benson, 2010; Dietz et al., 2014; Kohn et al., 2000; O'Leary, Wayne, et al., 2010). In the current study, the findings that physicians and nurses had discrepant attitudes toward teamwork could have serious implications for the provision of safe and high quality care. Lack of teamwork in health care settings can contribute to the occurrence of adverse events. Research shows that most errors in the health care system can be attributed to a lack of teamwork and communication breakdown (Leonard et al., 2004). Failure in teamwork has also been identified as contributing to tragic outcomes in most public inquiries worldwide (Hindle, Braithwaite, Travaglia, & Iedema, 2006).

9.2.3.2 Roles and responsibilities.

The influence of professional culture on physicians' and nurses' attitudes has been demonstrated in this study through physicians' and nurses' views about each other's roles and responsibilities in the delivery of care. For instance, physicians viewed themselves as decision makers and nurses as followers, their role limited to implementing the physicians' orders. In contrast, nurses believed that the care of patients was entrusted to nurses and that the physician's role in the delivery of care was limited to making the plan of treatment: the actual work was done by nurses. Such differences in physicians' and nurses' interpretation of their roles may influence the quality of collaboration and communication. Understanding one another's professional roles and responsibilities facilitates team-based working in health care settings (Canadian Patient Safety Institute, 2011). Pullon (2008) has

indicated that shared understanding of each other's roles and the complex relationships between members of a group leads to inter-professional trust and consequently improves teamwork.

The influence of professional culture on physicians' and nurses' attitudes is reflected in the finding that nurses delivered the majority of bedside care to the patient. In hospitals nurses were more involved with patient care and spent more time with patients than physicians. Spending more time with a patient and being at the bedside for long periods could explain why nurses had more positive attitudes toward patient safety. Grant et al. (2006) have suggested that providing the majority of care at the bedside of patients might be a reason why nurses have the most positive attitude toward a strong safety climate. Huang et al. (2010) indicated that health care workers working at the bedside had more real information about the safety culture in their hospital and more direct knowledge about how their hospital's policy affected patient care.

9.2.3.3 Staff expectations.

The influence of professional culture on physicians' and nurses' attitudes is reflected in the finding that physicians and nurses had different expectations. In this study, physicians' expectations were more likely to be professional, related to the availability of better medical devices and equipment that would improve their abilities to provide high levels of care. In contrast, nurses' expectations were limited to personal requirements such as income. This may be because most nurses had come to Saudi Arabia looking for better work opportunities and more income. Withers and Snowball (2003), who explored the expectations and experiences of Filipino nurses working in the United Kingdom, found that most participants shared high expectations of earning more money, having a higher standard of living and gaining professional experience (Withers & Snowball, 2003). Tzeng (2002) indicated that nurses' expectations were more likely to be related to the indirect working environment (i.e., hospital policies, benefits, leisure activities, housing, parking, and vacation), salary and promotion. These factors were a significant source of nurses' dissatisfaction (Tzeng, 2002). In the current study, it seems that met staff expectations influenced physicians' and nurses' attitudes toward their work experience. Lu, While, and Barriball (2005) have indicated that satisfaction with a job depends on the person's expectation of what the job should provide.

9.2.4 Patient safety practices.

Discrepancies in physicians' and nurses' attitudes toward patient safety may be attributed to a number of things, such as staff compliance with rules and guidelines, and incident reporting.

9.2.4.1 Staff compliance

In the current study, most participants believed that nurses were more compliant with rules and guidelines than physicians; physicians' non-compliance with hand hygiene guidelines was raised as an example. This finding is consistent with other studies that found non-compliance with hand hygiene guidelines was higher among physicians (Pittet et al., 2000; Pittet, Mourouga, & Perneger, 1999; Stein, Makarawo, & Ahmad, 2003). Such non-compliance may result from a number of factors, such as physicians' resistance to change. In health care, resistance to change is inherent to professional culture, even in the presence of rational data supporting the changes (Gerardi, 2005). Physicians' resistance has been identified as a factor in non-compliance with protocols and guidelines, resulting from the feeling that protocols and guidelines threaten their professional autonomy (Lawton & Parker, 2002; Tunis et al., 1994).

The findings of the current study that physicians were less likely than nurses to comply confirms previous findings that physicians tended to ignore rules and guidelines (McDonald, Waring, Harrison, Walshe, & Boaden, 2005). This may have serious implications for the safety of patients in the study sites, increasing the possibility of risk. For instance, non-compliance with hand hygiene guidelines could increase the transmission of infection to patients. A growing body of research indicates that compliance with hand hygiene guidelines minimises health care-associated infections in hospitals (Haas & Larson, 2007; Huis et al., 2013; Jain, Dogra, Mishra, Thakur, & Loomba, 2012; Pittet, 2001, 2003, 2005; Pittet et al., 2000; Roberts, Bolton, & Asman, 1998).

9.2.4.2 Reporting incidents.

Consistent with previous studies (Evans et al., 2006; Kingston, Evans, Smith, & Berry, 2004; Lawton & Parker, 2002; Wilson, Bekker, & Fylan, 2008), the findings of the current study indicate that nurses reported incidents more frequently than physicians. Nurses were supported and encouraged by their superiors to report

incidents; they were even rewarded for doing so. Physicians were less likely to report incidents due to their fear of punishment, damage to their reputation, losing trust or losing their position.

Non-punitive consequences encouraged workers to report incidents without fear of blame or punishment (Leape, 2009), and a growing body of literature has identified fear of punitive consequences as a barrier to reporting incidents in health care settings (Mayo & Duncan, 2004; Potylycki et al., 2006; Sorra et al., 2008; Stratton et al., 2004). For example, fear of medical malpractice is identified as preventing physicians from reporting medical errors (Robinson et al., 2002; Sutker, 2008). In the hospitals involved in this study, the reluctance of physicians to report incidents can compromise patient safety as it also limits the opportunity to learn from adverse events—which has been identified as an essential element for improving the safety and quality of care (Kohn et al., 2000; Lawton & Parker, 2002; Leape, 2002; Vincent, 2010; Wong & Beglaryan, 2004).

9.2.5 Work environment.

Qualitative findings suggest that the discrepancies in physicians' and nurses' attitudes toward patient safety are related to a number of factors related to the work environment in the study sites, including resources (i.e., staffing and equipment), working hours and staff development (i.e., training and education, and orientation of new staff).

9.2.5.1 Adequacy of resources.

The influence of the work environment is reflected in the findings that inadequate resources such as insufficient staffing or lack of equipment influenced physicians' and nurses' attitudes toward patient safety. Despite the fact that the study sites were referral hospitals for the eastern region of Saudi Arabia, there was a lack of equipment and insufficient levels of staffing, particularly in some medical specialities. Research has indicated that inadequate equipment influences clinical practices and contributes to adverse events (Coulter & Ellins, 2006). Similarly, inadequate levels of staffing have been linked to adverse patient outcomes such as increased mortality rates and greater length of stay in hospitals (Needleman et al., 2011; Pronovost et al., 2002; Stone et al., 2007). Staffing levels have also been

linked to infections (Harbarth, Sudre, Dharan, Cadenas, & Pittet, 1999; Jackson, Chiarello, Gaynes, & Gerberding, 2002; Stone et al., 2007; Vicca, 1999).

9.2.5.2 Extended working hours.

The influence of the work environment is reflected in the finding that physicians' extended working hours influenced their attitudes toward patient safety. In the current study, physicians sometimes worked for more than 24 hours, unlike nurses who worked 12-hour shifts. Physicians were required to undertake overnight duties in addition to their day working hours, even when they had to work the next day. In practice, such extensive working hours may have serious effects on physicians' performance, and consequently on the safety and quality of care they can provide. Extended working hours become a risk factor, leading to errors in hospitals (Narumi et al., 1999). They result in fatigue, which risks patient safety (Flin et al., 2009). Nocera and Khursandi (1998) have indicated that long working hours for physicians can impair their decisions, judgement, and competence, and consequently impact on the quality of care by increasing the opportunity for medical mishaps. Eastridge et al. (2003) also indicated that residents' work schedules led to sleep deprivation and fatigue, and consequently an increased risk of errors; and Gawande, Zinner, Studdert, and Brennan (2003) found that 33% of surgical adverse events resulted from fatigue and excessive workloads.

9.2.5.3 Staff development.

Staff development emerged as another issue influencing physicians' and nurses' attitudes. Most participants in this study raised a number of issues related to staff development, including training and education, the orientation of new staff, and attendance at training sessions. The findings suggest that nurses had more opportunities for training and education than their physician colleagues. Physicians claimed that they had limited opportunity for training and education, perhaps because hospitals where they worked were not training hospitals. In any case, opportunities for training and education were not available for all physicians, and particularly not for expatriates on contracts.

The finding that physicians had limited opportunities for training and education could have serious implications for the provision of safe care. Staff education and training are key elements preventing errors in the health care system (Kohn et al.,

2000). In a comparative analysis of eight public inquiries in six countries, a lack of staff training and education was associated with inadequate patient outcomes (Hindle et al., 2006). In the King Edward Memorial Hospital inquiry, for example, the findings identified a number of problems such as the inadequate skills of junior doctors in perinatal suturing (Mclean & Walsh, 2003), linked to the failure of the hospital to implement a suitable training programme to improve the clinical skills of junior doctors and ensure they had the skills to perform such procedures.

The findings of the current study suggest that staff development issues such as the provision of adequate orientation programmes for new staff influence physicians' and nurses' attitudes toward patient safety. Orientation programmes were limited to nurses, and covered all necessary information related to their work, such as skills, policies, and procedures, how to manage stress in their work environment, and the basics of Arabic language to facilitate communication with patients. Research has indicated that appropriate orientation programmes are a moderating factor in health care workers' satisfaction (Bowers, Esmond, & Jacobson, 2003; Harris-Kojetin, Lipson, Fielding, Kiefer, & Stone, 2004; Mathews & Nunley, 1992; Owens et al., 2001). The provision of adequate orientation programmes helps new staff to adjust to a their new work environment, clarify their professional responsibilities and increase their self-confidence and as a result, increase their job satisfaction (Godden, 2011; Hughes, 2008; Owens et al., 2001).

Staff development issues such as attendance have emerged as another factor influencing physicians' and nurses' attitudes. The findings of this study suggest that physicians were less likely than nurses to attend patient safety training sessions. Such non-attendance could limit opportunities to improve their knowledge and skills about patient safety, and consequently to improve patient safety in hospitals. Staff training and education are essential to improving patient safety (Agency for Health care Research and Quality, 2003; Australian Commission on Safety and Quality in Health Care, 2010; Brickell et al., 2009; Kohn et al., 2000; Maamoun, 2009; Page, 2004; Pronovost et al., 2003). The attendance of physicians at training sessions might increase their compliance with safety rules and guidelines such as hand hygiene. Staff training and education has been identified as a strategy to enhance staff compliance (Pittet, 2003; World Health Organization, 2005b).

9.3 Impact of Workforce Diversity

Language barriers can affect patient safety. In the current study most participants identified miscommunication as the main negative impact of having a diverse workforce, where neither Arabic nor English was the first language for most nurses. Inadequacy of communication between health care workers and patients has been identified as a barrier to effective and safe patient care (Ardoin & Wilson, 2010; Cohen, Rivara, Marcuse, McPhillips, & Davis, 2005; Flores, 2005; Johnstone & Kanitsaki, 2006; Kawi & Xu, 2009; Pearson & Aromataris, 2009; Vincent, Taylor-Adams, & Stanhope, 1998). Miscommunication could also occur between health care workers, as English was a second language for most of the participants in this study; this has been identified in previous research as one of the main causes of adverse events in health care systems (Al-Damouk, Pudney, & Bleetman, 2004; Kohn et al., 2000; Leonard et al., 2004; Thomas et al., 2004; Wong & Beglaryan, 2004). However, although workforce diversity may have a negative impact on patient safety, it may also have a positive effect. Some participants believed that having a diverse workforce was beneficial, as it was possible to share different work experiences and find better ways of ensuring safety. This finding is consistent with the study of Arabi and Shimemeri (2006), which indicated that having a diverse health care workforce provided an excellent environment for exchanging experiences.

9.4 Summary

The findings of the two phases of this study have been discussed and integrated. The quantitative findings were similar to those of other studies showing that physicians and nurses had discrepant attitudes toward patient safety. In order to understand why this should be the case, an explanatory model was developed to identify the influential factors. These included several issues related to workforce characteristics, management practices, professional culture, patient safety practices, and work environment. This chapter ended by discussing the impact of workforce diversity on patient safety. The next chapter will conclude this study and address limitations and recommendations.

Chapter 10: Conclusion and Recommendations

10.1 Introduction

This chapter summarises the study's findings and explains how they contribute to the growing body of literature. It also considers the study's limitations before ending by providing some recommendations for policy, practice, and research.

10.2 Background

Patient safety is a critical component of health care, and this study was designed to explore physicians' and nurses' attitudes toward patient safety in Armed Forces hospitals at the Eastern region of Saudi Arabia. The following objectives were addressed:

- to identify physicians' and nurses' attitudes toward factors that can have an impact on patient safety
- to determine whether these two professional groups have similar attitudes
- to identify and evaluate the association between physicians' and nurses' attitudes and characteristics (i.e., gender, nationality, job category, education, years in specialty, years of work experience, and work setting area)
- to investigate the factors influencing patient safety culture in Saudi Armed Forces hospitals.

Understanding health care workers' attitudes is the first step to improving patient safety in health care settings. The literature offers a number of instruments designed to assess health care workers' attitudes toward issues relevant to patient safety, many publicly available and easily accessed. These instruments vary considerably in their general characteristics, number of questions, patient safety dimensions covered, and also in their reliability and validity. The most widely used are the HSOPSC and SAQ, the two most recommended instruments for use in health care settings and showing good psychometric properties when exploring health care workers' attitudes toward patient safety.

A growing body of research explores physicians' and nurses' attitudes toward patient safety, most emanating from the United States; only a few have been conducted in Saudi Arabia. Their findings show that physicians and nurses have discrepant attitudes toward patient safety, and even toward patient safety initiatives. The literature offers mixed findings about the trends of differences between

physicians and nurses in terms of which group holds the most favourable attitudes. Why these differences exist at all is not fully understood, although a few studies provide possible explanations. Further studies need to be undertaken to investigate discrepancies in health care workers' attitudes toward patient safety.

Gaps in the Saudi literature relating to physicians' and nurses' attitudes toward patient safety have been addressed in this study, with the Saudi Armed Forces hospitals the focus. The findings add to the body of literature regarding physicians' and nurses' attitudes toward patient safety as helping to explain why discrepancies exist.

10.3 Summary of Overall Findings

A sequential explanatory mixed method design was adopted to assess physicians' and nurses' attitudes toward patient safety in three Saudi Armed Forces hospitals located in the eastern region of Saudi Arabia. The overall design is illustrated in Figure 4.1. Quantitative data collected in phase one provided a general picture of physicians' and nurses' attitudes toward patient safety, followed by qualitative data in phase two. Collecting both quantitative and qualitative data provided more insights into physicians' and nurses' attitudes, and helped in identifying factors that might influence their attitudes.

The SAQ was adopted in the quantitative phase as the primary tool to assess physicians' and nurses' attitudes toward six patient safety domains: teamwork climate, safety climate, stress recognition, perceptions of management, job satisfaction and working conditions. With exception of job satisfaction and teamwork climate, the overall findings revealed that less than half of the physicians and nurses had favourable attitudes toward patient safety domains, and in particular toward stress recognition and perceptions of management.

The findings have confirmed previous research that has shown physicians and nurses hold varied attitudes toward patient safety. These discrepancies can have serious implications for patient safety in the study sites. There was a weak association between the attitudes of physicians and nurses and their personal characteristics, which suggested that other factors might be involved; thus, further investigations were performed in phase two.

In the qualitative phase, a purposive sample of physicians and nurses were interviewed, and the findings suggested that a number of factors influenced

physicians' and nurses' attitudes toward patient safety. These were classified into five key themes: workforce characteristics, management practices, professional culture, patient safety practices, and work environment. Identifying these factors will enable health care managers and policy makers in Saudi Armed Forces hospitals to eliminate their negative impacts on health care workers' attitudes and consequently improve patient safety.

10.4 Limitations

The present study has a number of limitations, which must be taken into consideration before any interpretation is made regarding findings and conclusions:

- Researcher bias was a potential limitation, particularly in phase two. The researcher works in the training department of the MSD and might be known to some of the participants, particularly physicians. This was acknowledged as a potential limitation as it was anticipated that the researcher's administrative position might affect participants' willingness to participate in interviews, or might make them more guarded in their answers. To overcome this to some degree, the researcher's role as a PhD student and not an administrator was strongly emphasised in all interviews.
- Implementing this study in only three military hospitals in one region was another limitation. The findings may not be generalisable to other military hospitals, or to public Saudi hospitals. In addition, this study focused on physicians and nurses, and the findings may not be an accurate depiction of all health care workers at the study sites or working at other Saudi Armed Forces hospitals. Findings would have been more comprehensive if the study had included other hospitals in other regions.

10.5 Contribution of the Study

This study makes several contributions to the knowledge of physicians' and nurses' attitudes toward patient safety. The literature review identified a number of gaps:

- The dearth of empirical studies of why physicians and nurses have discrepant attitudes toward patient safety. This study makes a significant contribution to the existing body of knowledge by identifying factors that might have impacts on health care workers' attitudes toward patient safety.

- Most previous research into physicians' and nurses' attitudes toward patient safety is quantitative. The use of mixed methods, utilising qualitative data in phase two, provided richer information about factors that might affect patient safety in hospitals.
- Few empirical studies have evaluated physicians' and nurses' attitudes toward patient safety in Saudi Arabia, particularly in the Armed Force hospitals. The findings of this study make a significant contribution to the knowledge concerning health care workers' attitudes toward patient safety in Saudi Arabia.
- Despite evidence suggesting associations between attitudes of physicians and nurses and some of their characteristics, few studies have explored the influence of cultural differences. The findings of this study make a significant contribution to existing knowledge concerning the influence of cultural differences on health care workers' attitudes toward patient safety.

In addition to these contributions to existing literature, this study provides health care policy makers in Saudi Armed Forces hospitals with starting point data that can be used to benchmark future patient safety interventions. It can also be used to design new safety initiatives targeting weakness areas identified in this study, and to monitor and evaluate health care workers' attitudes following the implementation of new initiatives.

10.6 Recommendations

The main findings of the present study and the literature review suggest a range of recommendations covering policy, practice, and research.

10.6.1 Recommendations for policy.

- Health policy makers need to ensure patient safety. The first step is to evaluate health care workers' attitudes toward patient safety using a valid and reliable safety climate survey. The assessment of health care workers' attitudes toward patient safety needs to be conducted over time to identify areas of weakness that can be improved and to track changes in ongoing improvement initiatives.
- Health policy makers need to consider the influence of cultural difference in health care workers' attitudes toward patient safety. More effort should be made to understand which cultural factors may have a negative impact on

employees' attitudes, and to minimise their affects. Recognition of the influence of cultural differences will enable policy makers to design appropriate interventions to improve patient safety.

10.6.2 Recommendations for practice.

This study reveals several areas that need to be improved to ensure patient safety. Based on these, the following recommendations are offered for practice:

- Efforts should be made in the study sites to improve the working environment so that all health care workers can work as integrated teams and deliver their best performance to provide safe care, with particular attention to adequate staffing and equipment. Improving the working environment is a core element in improving patient safety.
- Creating a non-punitive environment and blame-free culture allows health care workers feel comfortable about speaking up when errors occur. Such an environment encourages health care workers to identify, report, and learn from errors. Efforts should be made to change the culture of safety in the study sites to one where workers will readily discuss and report medical errors without fear of adverse consequences.
- Facilitating a team-based working approach enhances inter-professional collaboration among nurses, physicians and allied health professionals.
- Facilitating good management practices at all levels, including all departments and units, can improve health care workers' satisfaction with their work experiences and improve retention.
- Promoting more educational and training programmes related to patient safety issues will enhance safety and quality of care in the hospitals by raising awareness of the importance of patient safety practices and the need to comply with roles and guidelines.
- Establishing well organised orientation programmes for newly appointed staff including physicians will help them to adjust to their new work environment, clarify their professional responsibilities and increase their self-confidence, and as a result, increase their job satisfaction.
- This study shows that the SAQ is a useful management tool that can be used to provide a general overview of patient safety culture by surveying health care workers' attitudes toward it. Such information makes a useful

contribution to identifying factors that may have an impact on patient safety. By obtaining such information, health care managers can identify areas of strength and weakness in the prevailing patient safety culture, and devise strategies for improvement.

10.6.3 Recommendations for future research.

Despite this study providing new insight into physicians' and nurses' attitudes toward patient safety in Saudi Armed Forces hospitals, additional research is needed. Based on the findings of this study, the following recommendations are offered:

- The findings reported in this study are derived from a study of three military hospitals in the eastern region of Saudi Arabia, and may not be representative of other hospitals in other regions; thus, it should be replicated in other Armed Forces hospitals.
- This study was limited to two professions, physicians and nurses. Future research should include other types of health care worker. It should also include an evaluation of senior managers' attitudes toward patient safety, and explore their role in promoting safety of care in Saudi Armed Forces hospitals.
- This study has shown the influence of culture on physicians' and nurses' attitudes toward patient safety. Further research should focus more on the influence of cultural differences on health care workers' attitudes, and how the attitudes of a multinational workforce impact upon safety and quality of care. Research should also focus on the implications of having a diverse health care workforce in the delivery of safe and high quality care.
- Findings of this study suggest that physicians are reluctant to follow rules and guidelines. Further research could be conducted to understand organisational factors that lead to physicians' non-compliance with rules and guidelines.

10.7 Summary

This study provides information on the attitudes of physicians and nurses about patient safety in the Saudi Armed Forces hospitals. The study confirmed previous studies showing that physicians and nurses have discrepant attitudes to patient safety. With exception of the job satisfaction and teamwork climate, most physicians and nurses involved in this study demonstrated unfavourable attitudes toward patient safety domains, in particular those of stress recognition and perceptions of

management, which indicates a need to improve patient safety in the study sites. Future studies should be conducted to understand physicians' and nurses' attitudes toward patient safety in other Saudi Armed Forces hospitals, and should also include other health care professionals. It would also be useful to investigate the influence of cultural differences and how the attitudes and cultural backgrounds of a multinational workforce affect safety and quality of care. Understanding health care workers' attitudes and the factors that influence patient safety attitudes enable health care policy makers to design appropriate interventions to improve the culture of care in hospitals.

References

- Abdou, H. A., & Saber, K. M. (2011). A baseline assessment of patient safety culture among nurses at student university hospital. *World Journal of Medical Sciences*, 6(1), 17-26. Retrieved March 22, 2012, from [http://www.idosi.org/wjms/6\(1\)11/3.pdf](http://www.idosi.org/wjms/6(1)11/3.pdf)
- Aboshaiqah, A. E., & Baker, O. G. (2013). Assessment of nurses' perceptions of patient safety culture in a Saudi Arabia hospital. *Journal of Nursing Care Quality*, 28(3), 272-280. <http://dx.doi.org/10.1097/NCQ.0b013e3182855cde>
- Aboul-Fotouh, A. M., Ismail, N. A., Ez Elarab, H. S., & Wassif, G. O. (2012). Assessment of patient safety culture among health care providers at a teaching hospital in Cairo, Egypt. *Eastern Mediterranean Health Journal*, 18(4), 372-277. Retrieved from <http://www.emro.who.int/emh-journal/eastern-mediterranean-health-journal/home.html>
- Abrahamson, K., Ramanujam, R., & Anderson, J. G. (2013). Co-worker characteristics and nurses' safety-climate perceptions. *International Journal of Health Care Quality Assurance*, 26(5), 447-454. <http://dx.doi.org/10.1108/IJHCQA-07-2011-0041>
- AbuAlRub, F. R., & Abu Alhijaa, E. H. (2014). The impact of educational interventions on enhancing perceptions of patient safety culture among Jordanian senior nurses. *Nursing forum*, 49(2), 139-150. <http://dx.doi.org/10.1111/nuf.12067>
- Agency for Health care Research and Quality. (2003). *AHRQ's Patient Safety Initiative: Building Foundations, Reducing Risk*. Rockville, MD. Retrieved October 8, 2010, from <http://archive.ahrq.gov/research/findings/final-reports/pscongrpt/index.html>
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *Journal of the American Medical Association*, 288(16), 1987-1993. <http://dx.doi.org/10.1001/jama.288.16.1987>
- Alahmadi, H. A. (2010). Assessment of patient safety culture in Saudi Arabian hospitals. *Quality and Safety in Health Care*, 19(5), 1-5. <http://dx.doi.org/10.1136/qshc.2009.033258>

- Al-Ahmadi, T. A. (2009). Measuring patient safety culture in Riyadh's hospitals: A comparison between public and private hospitals. *Journal of the Egyptian Public Health Association* 84(5-6), 479-500. Retrieved from <http://journals.lww.com/ephaj/pages/default.aspx>
- Alayed, A. S., Löf, H., & Johansson, U. B. (2014). Saudi Arabian ICU safety culture and nurses' attitudes. *International Journal of Health Care Quality Assurance*, 27(7), 581-593. <http://dx.doi.org/10.1108/IJHCQA-04-2013-0042>
- Al-Damouk, M., Pudney, E., & Bleetman, A. (2004). Hand hygiene and aseptic technique in the emergency department. *Journal of Hospital Infection*, 56(2), 137-141. <http://dx.doi.org/10.1016/j.jhin.2003.09.022>
- Aldossary, A., While, A., & Barriball, L. (2008). Health care and nursing in Saudi Arabia. *International Nursing Review*, 55(1), 125-128. <http://dx.doi.org/10.1111/j.1466-7657.2007.00596.x>
- Ali, M., Osborne, A., Bethune, R., & Pullyblank, A. (2011). Preoperative surgical briefings do not delay operating room start times and are popular with surgical team members. *Journal of Patient Safety*, 7(3), 139-143. <http://dx.doi.org/10.1097/PTS.0b013e31822a9fbc>
- AlJarallah, J. S., & AlRowaiss, N. (2013). The pattern of medical errors and litigation against doctors in Saudi Arabia. *Journal of Family and Community Medicine*, 20(2), 98-105. <http://dx.doi.org/10.4103/2230-8229.114771>
- Allard, J., Bleakley, A., Hobbs, A., & Coombes, L. (2011). Pre-surgery briefings and safety climate in the operating theatre. *BMJ Quality and Safety*, 20(8), 711-717. <http://dx.doi.org/10.1136/bmjqs.2009.032672>
- Allen, S., Chiarella, M., & Homer, C. S. (2010). Lessons learned from measuring safety culture: An Australian case study. *Midwifery*, 26(5), 497-503. <http://dx.doi.org/10.1016/j.midw.2010.07.002>
- Almalki, M., Fitzgerald, G., & Clark, M. (2011). Health care system in Saudi Arabia: An overview. *Eastern Mediterranean Health Journal*, 17(10), 784-793. Retrieved from <http://www.emro.who.int/emh-journal/eastern-mediterranean-health-journal/home.html>
- Almutairi, A., & McCarthy, A. (2012). A multicultural nursing workforce and cultural perspectives in Saudi Arabia: An overview. *The Health*, 3(3), 71-74. Retrieved from <http://www.thehealthj.com/index.html>

- Almutairi, A. F., Gardner, G., & McCarthy, A. (2013). Perceptions of clinical safety climate of the multicultural nursing workforce in Saudi Arabia: A cross-sectional survey. *Collegian, 20*(3), 187-194.
<http://dx.doi.org/10.1016/j.colegn.2012.08.002>
- Al-Saeed, A. (2007). Status of medical liability claims in Saudi Arabia. *Saudi Journal of Anaesthesia, 1*(1), 4. Retrieved from <http://www.saudija.org>
- Al-Saeed, A. H. (2010). Medical liability litigation in Saudi Arabia. *Saudi Journal of Anaesthesia, 4*(3), 122-126. <http://dx.doi.org/10.4103/1658-354X.71133>
- Al-saggaf, Y. (2004). The Effect of online community on offline community in Saudi Arabia. *The Electronic Journal on Information Systems in Developing Countries, 16*(2), 1-16. Retrieved from
<http://www.ejisdc.org/ojs2/index.php/ejisdc/index>
- Al-Shahri, M. Z. (2002). Culturally sensitive caring for Saudi patients. *Journal of Transcultural Nursing, 13*, 133-138.
<http://dx.doi.org/10.1177/104365960201300206>
- Al-Yousuf, M., Akerele, T. M., & Al-Mazrou, Y. Y. (2002). Organization of the Saudi health system. *Eastern Mediterranean Health Journal, 8*(4-5), 645–653. Retrieved from <http://www.emro.who.int/emh-journal/eastern-mediterranean-health-journal/home.html>
- Ammouri, A. A., Tailakh, A. K., Muliira, J. K., Geethakrishnan, R., & Al Kindi, S. N. (2015). Patient safety culture among nurses. *International Nursing Review, 62*(1), 102-110. <http://dx.doi.org/DOI:10.1111/inr.12159>
- Anderson, O., Davis, R., Hanna, G. B., & Vincent, C. A. (2013). Surgical adverse events: A systematic review. *American Journal of Surgery, 206*(2), 253-262.
<http://dx.doi.org/10.1016/j.amjsurg.2012.11.009>
- Arabi, Y., & Shimemeri, A. A. (2006). Critical care medicine in Saudi Arabia. *Eastern Mediterranean Health Journal, 12*(1-2), 225-230. Retrieved from
<http://www.emro.who.int/emh-journal/eastern-mediterranean-health-journal/home.html>
- Ardoin, K. B., & Wilson, K. B. (2010). Cultural diversity: what role does it play in patient safety? *Nursing for Women's Health, 14*(4), 322-326.
<http://dx.doi.org/10.1111/j.1751-486X.2010.01563.x>

- Arfanis, K., Shillito, J., & Smith, A. F. (2011). Risking safety or safely risking? Health care professionals' understanding of risk-taking in everyday work. *Psychology, Health & Medicine, 16*(1), 66-73.
<http://dx.doi.org/10.1080/13548506.2010.521566>
- Arora, S., Sevdalis, N., Ahmed, M., Wong, H., Moorthy, K., & Vincent, C. (2012). Safety skills training for surgeons: A half-day intervention improves knowledge, attitudes and awareness of patient safety. *Surgery, 152*(1), 26-31.
<http://dx.doi.org/10.1016/j.surg.2012.02.006>
- Australian Commission on Safety and Quality in Health Care. (2010). *Patient-centred care: Improving quality and safety by focusing care on patients and consumers: Discussion paper, draft for public consultation*. Sydney, Australia: ACSQHC. Retrieved June 2, 2011, from
<http://www.safetyandquality.gov.au/publications-resources/publications>
- Badir, A., & Herdman, E. A. (2008). Critical care nurses' perceptions of patient safety in Turkey. *Journal of Nursing Care Quality, 23*(4), 375-378.
<http://dx.doi.org/10.1097/01.NCQ.0000336677.56089.24>
- Bagnasco, A., Tibaldi, L., Chirone, P., Chiaranda, C., Panzone, M. S., Tangolo, D., . . . Sasso, L. (2011). Patient safety culture: An Italian experience. *Journal of Clinical Nursing, 20*(7-8), 1188-1195. <http://dx.doi.org/10.1111/j.1365-2702.2010.03377.x>
- Baker, D. P., Amodeo, A. M., Krokos, K. J., Slonim, A., & Herrera, H. (2010). Assessing teamwork attitudes in health care: Development of the TeamSTEPPS teamwork attitudes questionnaire. *Quality and Safety in Health Care, 19*(6), e49. <http://dx.doi.org/10.1136/qshc.2009.036129>
- Baker, G. R., Norton, P. G., Flintoft, V., Blais, R., Brown, A., Cox, J., . . . Tamblyn, R. (2004). The Canadian Adverse Events Study: The incidence of adverse events among hospital patients in Canada. *Canadian Medical Association Journal, 170*(11), 1678-1686. <http://dx.doi.org/10.1503/cmaj.1040498>
- Ballangrud, R., Hedelin, B., & Hall-Lord, M. L. (2012). Nurses' perceptions of patient safety climate in intensive care units: A cross-sectional study. *Intensive and Critical Care Nursing, 28*(6), 344-354.
<http://dx.doi.org/10.1016/j.iccn.2012.01.001>

- Basuni, E. M., & Bayoumi, M. M. (2015). Improvement critical care patient safety: Using nursing staff development strategies, at Saudi Arabia. *Global Journal of Health Science*, 7(2), 335-343. <http://dx.doi.org/10.5539/gjhs.v7n2p335>
- Bechtold, M. L., Scott, S., Dellsperger, K. C., Hall, L. W., Nelson, K., & Cox, K. R. (2007). Educational quality improvement report: Outcomes from a revised morbidity and mortality format that emphasised patient safety. *Quality and Safety in Health Care*, 16(6), 422-427. <http://dx.doi.org/10.1136/qshc.2006.021139>
- Benson, A. (2010). Creating a culture to support patient safety. The contribution of a multidisciplinary team development programme to collaborative working. *German Journal for Evidence and Quality in Health Care*, 104(1), 10-17. <http://dx.doi.org/10.1016/j.zefq.2009.12.030>
- Berhie, G. (1991). Emerging issues in health planning in Saudi Arabia: The effects of organisation and development on the health care system. *Social Science and Medicine*, 33(7), 815-824. [http://dx.doi.org/10.1016/0277-9536\(91\)90386-Q](http://dx.doi.org/10.1016/0277-9536(91)90386-Q)
- Bleakley, A., Allard, J., & Hobbs, A. (2012). Towards culture change in the operating theatre: Embedding a complex educational intervention to improve teamwork climate. *Medical Teacher*, 34(9), e635-e640. <http://dx.doi.org/10.3109/0142159X.2012.687484>
- Boan, D. M., Nadzam, D., & Clapp, J. R. (2012). The impact of variance in perception of the organization on capacity to improve in hospital work groups. *Group Dynamics: Theory, Research, and Practice*, 16(3), 206-217. <http://dx.doi.org/10.1037/a0028547>
- Bodur, S., & Filiz, E. (2009). A survey on patient safety culture in primary health care services in Turkey. *International Journal for Quality in Health Care*, 21(5), 348-355. <http://dx.doi.org/10.1093/intqhc/mzp035>
- Bodur, S., & Filiz, E. (2010). Validity and reliability of Turkish version of "Hospital Survey on Patient Safety Culture" and perception of patient safety in public hospitals in Turkey. *BMC Health Services Research*, 10, 28. <http://dx.doi.org/10.1186/1472-6963-10-28>
- Boeije, H. (2010). *Analysis in qualitative research* (1st ed.). London, England: Sage Publications.

- Bognár, A., Barach, P., Johnson, J. K., Duncan, R. C., Birnbach, D., Woods, D., . . . Bacha, E. A. (2008). Errors and the burden of errors: Attitudes, perceptions, and the culture of safety in pediatric cardiac surgical teams. *The Annals of Thoracic Surgery*, *85*(4), 1374-1381.
<http://dx.doi.org/10.1016/j.athoracsur.2007.11.024>
- Böhmer, A. B., Kindermann, P., Schwanke, U., Bellendir, M., Tinschmann, T., Schmidt, C., . . . Gerbershagen, M. U. (2013). Long-term effects of a perioperative safety checklist from the viewpoint of personnel. *Acta Anaesthesiologica Scandinavica*, *57*(2), 150-157.
<http://dx.doi.org/10.1111/aas.12020>
- Böhmer, A. B., Wappler, F., Tinschmann, T., Kindermann, P., Rixen, D., Bellendir, M., . . . Gerbershagen, M. U. (2012). The implementation of a perioperative checklist increases patients' perioperative safety and staff satisfaction. *Acta Anaesthesiologica Scandinavica*, *56*(3), 332-338.
<http://dx.doi.org/10.1111/j.1399-6576.2011.02590.x>
- Borrill, C. S., Carletta, J., Carter, A., Dawson, J., Garrod, S., Rees, A., . . . West, M. A. (2001). *The effectiveness of health care teams in the National Health Service*. Birmingham, England: Aston Centre for Health Service Organisation Research. Retrieved June 6, 2012, from
<http://homepages.inf.ed.ac.uk/jeanc/DOH-final-report.pdf>
- Bowers, B., Esmond, S., & Jacobson, N. (2003). Turnover reinterpreted: CNAs talk about why they leave. *Journal of Gerontological Nursing*, *29*(3), 36-43.
Retrieved from <http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Bowling, A. (2011). *Research methods in health: Investigating health and health services* (3rd ed.). Maidenhead, England: McGraw-Hill Education.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. Retrieved from
<http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Brborović, H., Šklebar, I., Brborović, O., Brumen, V., & Mustajbegović, J. (2014). Development of a Croatian version of the US Hospital Survey on Patient Safety Culture questionnaire: Dimensionality and psychometric properties. *Postgraduate Medical Journal*, *90*(1061), 125-132.
<http://dx.doi.org/10.1136/postgradmedj-2013-131814>

- Brickell, T., Nicholls, T., Procyshyn, R., McLean, C., Dempster, R., Lavoie, J., . . . Wang, E. (2009). *Patient safety in mental health*. Edmonton, Alberta: Canadian Patient Safety Institute and Ontario Hospital Association. Retrieved April 19, 2012, from <http://www.patientsafetyinstitute.ca/en/Pages/default.aspx>
- Buston, K., Parry-Jones, W., Livingston, M., Bogan, A., & Wood, S. (1998). Qualitative research. *The British Journal of Psychiatry*, *172*(3), 197-199. <http://dx.doi.org/10.1192/bjp.172.3.197>
- Byrne, M. (2001). Interviewing as a data collection method. *Association of Perioperative Registered Nurses Journal*, *74*(2), 233-235. [http://dx.doi.org/10.1016/S0001-2092\(06\)61533-0](http://dx.doi.org/10.1016/S0001-2092(06)61533-0)
- Canadian Patient Safety Institute. (2011). *Canadian framework for teamwork and communication: Literature review, need assessment, evaluation of training tools and expert consultations*. Edmonton: Canada: Canadian Patient Safety Institute. Retrieved July 9, 2012, from <http://www.patientsafetyinstitute.ca/en/Pages/default.aspx>
- Carayon, P., Hundt, A., Alvarado, C., Springman, S., & Ayoub, P. (2006). Patient safety in outpatient surgery: The viewpoint of the health care providers. *Ergonomics*, *49*(5-6), 470-485. <http://dx.doi.org/10.1080/00140130600568717>
- Carney, B. T., Mills, P. D., Bagian, J. P., & Weeks, W. B. (2010). Sex differences in operating room care giver perceptions of patient safety: A pilot study from the Veterans Health Administration Medical Team Training Programme. *Quality and Safety in Health Care*, *19*(2), 128-131. <http://dx.doi.org/10.1136/qshc.2008.028233>
- Carney, B. T., West, P., Neily, J., Mills, P. D., & Bagian, J. P. (2010). Differences in nurse and surgeon perceptions of teamwork: Implications for use of a briefing checklist in the OR. *Association of Perioperative Registered Nurses Journal*, *91*(6), 722-729. <http://dx.doi.org/10.1016/j.aorn.2009.11.066>
- Central Department of Statistics & Information. (2010). *General Census 2010*. Retrieved April 16, 2012, from <http://www.cdsi.gov.sa>
- Central Department of Statistics & Information. (2012). *National account indicators 2012*. Retrieved October 3, 2013, from <http://www.cdsi.gov.sa>

- Central Intelligence Agency. (2013). *The World Factbook 2013-14*. Washington, DC. Retrieved April 18, 2015, from <https://www.cia.gov/index.html>
- Chaboyer, W., Chamberlain, D., Hewson-Conroy, K., Greal, B., Elderkin, T., Brittin, M., . . . Thalib, L. (2013). Safety culture in Australian intensive care units: Establishing a baseline for quality improvement. *American Journal of Critical Care, 22*(2), 93-102. <http://dx.doi.org/10.4037/ajcc2013722>
- Chen, I., & Li, H. (2010). Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture(HSOPSC). *BMC Health Services Research, 10*, 152. <http://dx.doi.org/10.1186/1472-6963-10-152>
- Chiang, H. Y., Lin, S. Y., Hsiao, Y. C., & Chang, Y. (2012). Culture influence and predictors for behavioral involvement in patient safety among hospital nurses in Taiwan. *Journal of Nursing Care Quality, 27*(4), 359-367. <http://dx.doi.org/10.1097/NCQ.0b013e31825ba89e>
- Chiu, C. H., Pan, W. H., & Wei, C. J. (2008). Does organizational culture impact patient safety management? *Asian Journal of Health and Information Sciences, 3*(1-4), 88-100. Retrieved from <http://210.60.31.132/ajhis/index.htm>
- Cohen, A. L., Rivara, F., Marcuse, E. K., McPhillips, H., & Davis, R. (2005). Are language barriers associated with serious medical events in hospitalized pediatric patients? *Pediatrics, 116*(3), 575-579. <http://dx.doi.org/10.1542/peds.2005-0521>
- Colla, J. B., Bracken, A. C., Kinney, L. M., & Week, W. B. (2005). Measuring patient safety climate: A review of surveys. *Quality and Safety in Health Care, 14*(5), 364-366. <http://dx.doi.org/10.1136/qshc.2005.014217>
- Collins, K. M., Onwuegbuzie, A. J., & Jiao, Q. G. (2007). A mixed methods investigation of mixed methods sampling designs in social and health science research. *Journal of Mixed Methods Research, 1*(3), 267-294. <http://dx.doi.org/10.1177/1558689807299526>
- Cooper, M. D. (2000). Towards a model of safety culture. *Safety Science, 36*(2), 111-136. [http://dx.doi.org/10.1016/S0925-7535\(00\)00035-7](http://dx.doi.org/10.1016/S0925-7535(00)00035-7)
- Coulter, A., & Ellins, J. (2006). *Patient-focused interventions: A review of the evidence*. London, England: The Health Foundation. Retrieved February 24, 2014, from <http://www.health.org.uk/publication/patient-focused-interventions>

- Cox, S., & Flin, R. (1998). Safety culture: Philosopher's stone or man of straw? *Work and Stress, 12*(3), 189-201. <http://dx.doi.org/10.1080/02678379808256861>
- Cox, T. H., Lobel, S. A., & McLeod, P. L. (1991). Effects of ethnic group cultural differences on cooperative and competitive behavior on a group task. *Academy of Management Journal, 34*(3), 827-847. Retrieved from <http://www.jstor.org.dbgw.lis.curtin.edu.au>
- Coyle, Y. M., Mercer, S. Q., Murphy-Cullen, C. L., Schneider, G. W., & Hynan, L. S. (2005). Effectiveness of a graduate medical education programme for improving medical event reporting attitude and behavior. *Quality and Safety in Health Care, 14*(5), 383-388. <http://dx.doi.org/10.1136/qshc.2005.013979>
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research* (2nd ed.). Los Angeles, CA: SAGE Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice, 39*(3), 124-130. http://dx.doi.org/10.1207/s15430421tip3903_2
- Davis, R. E., Sevdalis, N., & Vincent, C. A. (2012). Patient involvement in patient safety: The health-care professional's perspective. *Journal of Patient Safety, 8*(4), 182-188. <http://dx.doi.org/10.1097/PTS.0b013e318267c4aa>
- Deilkas, E. T., & Hofoss, D. (2008). Psychometric properties of the Norwegian version of the Safety Attitudes Questionnaire (SAQ), Generic version (Short Form 2006). *BMC Health Services Research, 8*, 191. <http://dx.doi.org/10.1186/1472-6963-8-191>
- Delgado Hurtado, J. J., Jiménez, X., Peñalongo, M. A., Villatoro, C., de Izquierdo, S., & Cifuentes, M. (2012). Acceptance of the WHO Surgical Safety Checklist among surgical personnel in hospitals in Guatemala city. *BMC Health Services Research, 12*, 169. <http://dx.doi.org/10.1186/1472-6963-12-169>
- Department of Health. (2000). *An organisation with a memory: Report of an expert group on learning from adverse events in the NHS*. London, England: The Stationery Office. Retrieved March 6, 2012, from <http://psnet.ahrq.gov/resource.aspx?resourceID=1568>

- Devriendt, E., Van den Heede, K., Coussement, J., Dejaeger, E., Surmont, K., Heylen, D., . . . Milisen, K. (2012). Content validity and internal consistency of the Dutch translation of the Safety Attitudes Questionnaire: An observational study. *International Journal of Nursing Studies*, *49*(3), 327-337. <http://dx.doi.org/10.1016/j.ijnurstu.2011.10.002>
- de Vries, E. N., Ramrattan, M. A., Smorenburg, S. M., Gouma, D. J., & Boermeester, M. A. (2008). The incidence and nature of in-hospital adverse events: A systematic review. *Quality and Safety in Health Care*, *17*(3), 216-223. <http://dx.doi.org/10.1136/qshc.2007.023622>
- de Wet, C., Johnson, P., Mash, R., McConnachie, A., & Bowie, P. (2012). Measuring perceptions of safety climate in primary care: A cross-sectional study. *Journal of Evaluation in Clinical Practice*, *18*(1), 135-142. <http://dx.doi.org/10.1111/j.1365-2753.2010.01537.x>
- DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education*, *40*(4), 314-321. <http://dx.doi.org/10.1111/j.1365-2929.2006.02418.x>
- Dietz, A. S., Pronovost, P. J., Mendez-Tellez, P. A., Wyskiel, R., Marsteller, J. A., Thompson, D. A., & Rosen, M. A. (2014). A systematic review of teamwork in the intensive care unit: What do we know about teamwork, team tasks, and improvement strategies? *Journal of Critical Care*, *29*(6), 908-914. <http://dx.doi.org/10.1016/j.jcrc.2014.05.025>
- di Martino, P., Ban, K. M., Bartoloni, A., Fowler, K. E., Saint, S., & Mannelli, F. (2011). Assessing the sustainability of hand hygiene adherence prior to patient contact in the emergency department: A 1-year postintervention evaluation. *American Journal of Infection Control*, *39*(1), 14-18. <http://dx.doi.org/10.1016/j.ajic.2010.06.015>
- Eastridge, B. J., Hamilton, E. C., O'Keefe, G. E., Rege, R. V., Valentine, R. J., Jones, D. J., . . . Thal, E. R. (2003). Effect of sleep deprivation on the performance of simulated laparoscopic surgical skill. *The American Journal of Surgery*, *186*(2), 169-174. [http://dx.doi.org/10.1016/S0002-9610\(03\)00183-1](http://dx.doi.org/10.1016/S0002-9610(03)00183-1)
- Elder, N. C., Brungs, S. M., Nagy, M., Kudel, I., & Render, M. L. (2008). Intensive care unit nurses' perceptions of safety after a highly specific safety

- intervention. *Quality and Safety in Health Care*, 17(1), 25-30.
<http://dx.doi.org/10.1136/qshc.2006.021949>
- El-Jardali, F., Sheikh, F., Garcia, N. A., Jamal, D., & Abdo, A. (2014). Patient safety culture in a large teaching hospital in Riyadh: baseline assessment, comparative analysis and opportunities for improvement. *BMC Health Services Research*, 14, 122. <http://dx.doi.org/10.1186/1472-6963-14-122>
- Erasmus, V., Brouwer, W., van Beeck, E. F., Oenema, A., Daha, T. J., Richardus, J. H., . . . Brug, J. (2009). A qualitative exploration of reasons for poor hand hygiene among hospital workers: Lack of positive role models and of convincing evidence that hand hygiene prevents cross-infection. *Infection Control and Hospital Epidemiology*, 30(5), 415-419.
<http://dx.doi.org/10.1086/596773>
- Etchegaray, J. M., Gallagher, T. H., Bell, S. K., Dunlap, B., & Thomas, E. J. (2012). Error disclosure: A new domain for safety culture assessment. *BMJ Quality and Safety*, 21(7), 594-599. <http://dx.doi.org/10.1136/bmjqs-2011-000530>
- Evans, S. M., Berry, J. G., Smith, B. J., Esterman, A., Selim, P., O'Shaughnessy, J., & DeWit, M. (2006). Attitudes and barriers to incident reporting: A collaborative hospital study. *Quality and Safety in Health Care*, 15(1), 39-43.
<http://dx.doi.org/10.1136/qshc.2004.012559>
- Farhan, M., Brown, R., Vincent, C., & Woloshynowych, M. (2012). The ABC of handover: Impact on shift handover in the emergency department. *Emergency Medicine Journal*, 29(12), 947-953. <http://dx.doi.org/10.1136/emered-2011-200201>
- Flin, R. (2003). Danger - Men at work: Management influences and safety. *Human Factors and Ergonomics in Manufacturing*, 23(4), 261-268.
<http://dx.doi.org/10.1002/hfm.10042>
- Flin, R. (2007). Measuring safety culture in health care: A case for accurate diagnosis. *Safety Science*, 45(6), 653-667.
<http://dx.doi.org/10.1016/j.ssci.2007.04.003>
- Flin, R., Burns, C., Mearns, K., Yule, S., & Robertson, E. M. (2006). Measuring safety climate in health care. *Quality and Safety in Health Care* 15(2), 109-115. <http://dx.doi.org/10.1136/qshc.2005.014761>

- Flin, R., Fletcher, G., McGeorge, P., Sutherland, A., & Patey, R. (2003). Anaesthetists' attitudes to teamwork and safety. *Anaesthesia*, *58*(3), 233-242. <http://dx.doi.org/10.1046/j.1365-2044.2003.03039.x>
- Flin, R., Mearns, K., O'Connor, P., & Bryden, R. (2000). Measuring safety climate: Identifying the common features. *Safety Science*, *34*(1-3), 177-192. [http://dx.doi.org/10.1016/S0925-7535\(00\)00012-6](http://dx.doi.org/10.1016/S0925-7535(00)00012-6)
- Flin, R., Winter, J., Sarac, C., & Raduma, M. (2009). *Human factors in patient safety: Review of topics and tools*. Geneva, Switzerland: World Health Organisation. Retrieved March 6, 2012, from http://www.who.int/patientsafety/research/methods_measures/en
- Flin, R., Yule, S., McKenzie, L., Paterson-Brown, S., & Maran, N. (2006). Attitudes to teamwork and safety in the operating theatre. *The Surgeon*, *4*(3), 145-151. [http://dx.doi.org/10.1016/S1479-666X\(06\)80084-3](http://dx.doi.org/10.1016/S1479-666X(06)80084-3)
- Flores, G. (2005). The impact of medical interpreter services on the quality of health care: A systematic review. *Medical Care Research and Review*, *62*(3), 255-299. <http://dx.doi.org/10.1177/1077558705275416>
- Flotta, D., Rizza, P., Bianco, A., Pileggi, C., & Pavia, M. (2012). Patient safety and medical errors: Knowledge, attitudes and behavior among Italian hospital physicians. *International Journal for Quality in Health Care*, *24*(3), 258-265. <http://dx.doi.org/10.1093/intqhc/mzs014>
- France, D. J., Greevy, R. A., Liu, X., Burgess, H., Dittus, R. S., Weinger, M. B., & Speroff, T. (2010). Measuring and comparing safety climate in intensive care units. *Medical Care*, *48*(3), 279-284. <http://dx.doi.org/10.1097/MLR.0b013e3181c162d6>
- France, D. J., Stiles, R., Gaffney, E. A., Seddon, M. R., Grogan, E. L., Nixon, W. R. J., & Speroff, T. (2005). Crew resource management training: Clinicians' reaction and attitudes. *Association of Perioperative Registered Nurses Journal*, *82*(2), 213-224. [http://dx.doi.org/10.1016/S0001-2092\(06\)60313-X](http://dx.doi.org/10.1016/S0001-2092(06)60313-X)
- Friese, C. R., & Manojlovich, M. (2012). Nurse-physician relationships in ambulatory oncology settings. *Journal of Nursing Scholarship*, *44*(3), 258-265. <http://dx.doi.org/10.1111/j.1547-5069.2012.01458.x>
- Friesen, M. A., Farquhar, M. B., & Hughes, R. (2005). *The nurse's role in promoting a culture of patient safety*. Washington, D.C.: Centre for American Nurses.

- Retrieved March 6, 2012, from
<http://ana.nursingworld.org/mods/archive/mod780/cerolefull.htm>
- Fujita, S., Seto, K., Ito, S., Wu, Y., Huang, C. C., & Hasegawa, T. (2013). The characteristics of patient safety culture in Japan, Taiwan and the United States. *BMC Health Services Research, 13*, 20.
<http://dx.doi.org/10.1186/1472-6963-13-20>
- Fukuda, H., Imanaka, Y., Hirose, M., & Hayashida, K. (2010). Impact of system-level activities and reporting design on the number of incident reports for patient safety. *Quality and Safety in Health Care, 19*(2), 122-127.
<http://dx.doi.org/10.1136/qshc.2008.027532>
- Gaal, S., Verstappen, W., & Wensing, M. (2010). Patient safety in primary care: A survey of general practitioners in The Netherlands. *BMC Health Services Research, 10*, 21. <http://dx.doi.org/10.1186/1472-6963-10-21>
- Gallego, B., Westbrook, M. T., Dunn, A. G., & Braithwaite, J. (2012). Investigating patient safety culture across a health system: Multilevel modelling of differences associated with service types and staff demographics. *International Journal for Quality in Health Care, 24*(4), 311-320.
<http://dx.doi.org/10.1093/intqhc/mzs028>
- Garon, M. (2012). Speaking up, being heard: Registered nurses' perceptions of workplace communication. *Journal of Nursing Management, 20*(3), 361-371.
<http://dx.doi.org/10.1111/j.1365-2834.2011.01296.x>
- Gauld, R., & Horsburgh, S. (2014). Health care professional perspectives on quality and safety in New Zealand public hospitals : Findings from a national survey. *Australian Health Review, 38*(1), 109-114.
<http://dx.doi.org/10.1071/AH13116>
- Gawande, A. A., Zinner, M. J., Studdert, D. M., & Brennan, T. A. (2003). Analysis of errors reported by surgeons at three teaching hospitals. *Surgery, 133*(6), 614-621. <http://dx.doi.org/10.1067/msy.2003.169>
- Gerardi, D. (2005). The culture of health care: How professional and organisational culture impact conflict management. *Georgia State University Law Review, 21*(Rev. 857) Retrieved from
<http://www.heinonline.org.dbgw.lis.curtin.edu.au>

- Gershon, R. R., Karkashian, C. D., Grosch, J. W., Murphy, L. R., Escamilla-Cejudo, A., Flanagan, P. A., . . . Martin, L. (2000). Hospital safety climate and its relationship with safe work practices and workplace exposure incidents. *American Journal of Infection Control, 28*(3), 211-221.
<http://dx.doi.org/10.1067/mic.2000.105288>
- Ghobashi, M. M., El-ragehy, H. A., & Mosleh, H. (2014). Assessment of patient safety culture in primary health care settings in Kuwait. *Epidemiology, Biostatistics and Public Health, 11*(3), 1-9. <http://dx.doi.org/10.2427/9101>
- Glendon, A. I., Clarke, S. G., & McKenna, E. F. (2006). *Human safety and risk management* (2nd ed.). Boca Raton, FL: Taylor & Francis Group.
- Glendon, A. I., & Stanton, N. A. (2000). Perspectives on safety culture. *Safety Science, 34*(1), 193-214. [http://dx.doi.org/10.1016/S0925-7535\(00\)00013-8](http://dx.doi.org/10.1016/S0925-7535(00)00013-8)
- Godden, B. (2011). Orientation, competencies, skills fairs: Sorting it all out. *Journal of Perianesthesia Nursing, 26*(2), 107-109.
<http://dx.doi.org/10.1016/j.jopan.2011.01.006>
- Gore, D. C., Powell, J. M., Baer, J. G., Sexton, K. H., Richardson, C. J., Marshall, D. R., . . . Townsend, C. M. (2010). Crew resource management improved perception of patient safety in the operating room. *American Journal of Medical Quality, 25*(1), 60-63. <http://dx.doi.org/10.1177/1062860609351236>
- Grant, M. J., Donaldson, A. E., & Larsen, G. Y. (2006). The safety culture in a children's hospital. *Journal of Nursing Care Quality, 21*(3), 223-229.
Retrieved from <http://ovidsp.tx.ovid.com.dbgw.lis.curtin.edu.au>
- Grogan, E. L., Stiles, R. A., France, D. J., Speroff, T., Morris, J. A., Nixon, B., . . . Pinson, C. W. (2004). The impact of aviation-based teamwork training on the attitudes of health-care professionals. *Journal of the American College of Surgeons, 199*(6), 843-848.
<http://dx.doi.org/10.1016/j.jamcollsurg.2004.08.021>
- Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology, 29*(2), 75-91. Retrieved from <http://www.jstor.org.dbgw.lis.curtin.edu.au>
- Guldenmund, F. W. (2000). The nature of safety culture: A review of theory and research. *Safety Science, 34*(1), 215-257. [http://dx.doi.org/10.1016/S0925-7535\(00\)00014-X](http://dx.doi.org/10.1016/S0925-7535(00)00014-X)

- Guldenmund, F. W. (2007). The use of questionnaires in safety culture research—an evaluation. *Safety Science*, 45(6), 723-743.
<http://dx.doi.org/10.1016/j.ssci.2007.04.006>
- Haas, J. P., & Larson, E. L. (2007). Measurement of compliance with hand hygiene. *The Journal of Hospital Infection*, 66(1), 6-14.
<http://dx.doi.org/10.1016/j.jhin.2006.11.013>
- Hall, P. (2005). Interprofessional teamwork: Professional cultures as barriers. *Journal of interprofessional care*, 19(Suppl 1), 188-196.
<http://dx.doi.org/10.1080/13561820500081745>
- Haller, G., Garnerin, P., Morales, M. A., Pfister, R., Berner, M., Irion, O., . . . Kern, C. (2008). Effect of crew resource management training in a multidisciplinary obstetrical setting. *International Journal for Quality in Health Care*, 20(4), 254-263. <http://dx.doi.org/10.1093/intqhc/mzn018>
- Hamdan, M. (2013). Measuring safety culture in Palestinian neonatal intensive care units using the Safety Attitudes Questionnaire. *Journal of Critical Care*, 28(5), 886-e887. <http://dx.doi.org/10.1016/j.jcrc.2013.06.002>
- Hansen, E. C. (2006). *Successful qualitative health research: A practical introduction*. Crows Nest, Australia: Allen & Unwin.
- Hansen, L. O., Williams, M. V., & Singer, S. J. (2011). Perceptions of hospital safety climate and incidence of readmission. *Health Services Research*, 46(2), 596-616. <http://dx.doi.org/10.1111/j.1475-6773.2010.01204.x>
- Harbarth, S., Sudre, P., Dharan, S., Cadenas, M., & Pittet, D. (1999). Outbreak Of enterobacter cloacae related to understaffing, overcrowding, and poor hygiene practices. *Infection Control and Hospital Epidemiology*, 20(9), 598-603. <http://dx.doi.org/10.1086/501677>
- Harris-Kojetin, L., Lipson, D., Fielding, J., Kiefer, K., & Stone, R. (2004). *Recent findings on frontline long-term care workers: A research synthesis 1999-2003*. Washington, D.C.: Office of Disability, Aging, and Long-Term Policy, US Department of Health and Human Services. Retrieved March 8, 2014, from <http://aspe.hhs.gov/daltcp/reports/insight.pdf>
- Hartmann, C. W., Rosen, A. K., Meterko, M., Shokeen, P., Zhao, S., Singer, S., . . . Gaba, D. M. (2008). An overview of patient safety climate in the VA. *Health*

- Services Research*, 43(4), 1263-1284. <http://dx.doi.org/10.1111/j.1475-6773.2008.00839.x>
- Hartnell, N., MacKinnon, N., Sketris, I., & Fleming, M. (2012). Identifying, understanding and overcoming barriers to medication error reporting in hospitals: A focus group study. *BMJ Quality and Safety*, 21(5), 361-368. <http://dx.doi.org/10.1136/bmjqs-2011-000299>
- Haugen, A. S., Søfteland, E., Eide, G. E., Nortvedt, M. W., Aase, K., & Harthug, S. (2010). 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 Services Research*, 10, 279. <http://dx.doi.org/10.1186/1472-6963-10-279>
- Haydar, M. (2015, February 18). Medical services department of armed forces is targeting international accreditation. *Alriyadh*. Retrieved March 2, 2015, from <http://www.alriyadh.com>
- Health and Safety Commission, & Advisory Committee on the Safety of Nuclear Installations Study Group on Human Factors. (1993). *Third Report: Organising for Safety*. London, England: H.M. Stationery Office.
- Hedsköld, M., Pukk-Härenstam, K., Berg, E., Lindh, M., Soop, M., Øvretveit, J., & Sachs, M. A. (2013). Psychometric properties of the Hospital Survey on Patient Safety Culture, HSOPSC, applied on a large Swedish health care sample. *BMC Health Services Research*, 13, 332. <http://dx.doi.org/10.1186/1472-6963-13-332>
- Hellings, J., Schrooten, W., Klazinga, N., & Vleugels, A. (2007). Challenging patient safety culture: Survey results. *International Journal of Health Care Quality Assurance*, 20(7), 620-632. <http://dx.doi.org/10.1108/09526860710822752>
- Helmreich, R. L. (1999). *Building safety on the three cultures of aviation*. Paper presented at the IATA Human Factors Seminar, Bangkok, Thailand. Retrieved September 1, 2014, from <http://www.pacdeff.com/pdfs/Cultures of Aviation Helmreich.pdf>
- Hesse-Biber, S. N., & Leavy, P. (2011). *The practice of qualitative research* (2nd ed.). Los Angeles, CA: Sage Publications.
- Hicks, C. M., Bandiera, G. W., & Denny, C. J. (2008). Building a simulation-based crisis resource management course for emergency medicine, phase 1: Results

- from an interdisciplinary needs assessment survey. *Academic Emergency Medicine*, 15(11), 1136-1143. <http://dx.doi.org/10.1111/j.1553-2712.2008.00185.x>
- Hindle, D., Braithwaite, J., Travaglia, J., & Iedema, R. (2006). *Patient Safety: A comparative analysis of eight Inquiries in six countries*. Sydney, Australia: The Centre for Clinical Governance Research. Retrieved March 6, 2012, from <http://www.cec.health.nsw.gov.au/publications>
- Hindle, D., Haraga, S., Radu, C. P., & Yazbeck, A. M. (2008). What do health professionals think about patient safety? *Journal of Public Health*, 16(2), 87-96. <http://dx.doi.org/10.1007/s10389-007-0152-y>
- Hoffmann, B., Domanska, O. M., Albay, Z., Mueller, V., Guethlin, C., Thomas, E. J., & Gerlach, F. M. (2011). The Frankfurt Patient Safety Climate Questionnaire for General Practices (FraSiK): Analysis of psychometric properties. *BMJ Quality and Safety*, 20, 797-805. <http://dx.doi.org/10.1136/bmjqs.2010.049411>
- Hoffmann, B., Miessner, C., Albay, Z., Schrober, J., Weppler, K., Gerlach, F. M., & Guthlin, C. (2013). Impact of individual and team features of patient safety climate: A survey in family practices. *Annals of Family Medicine*, 11(4), 355-362. <http://dx.doi.org/10.1370/afm.1500>
- Hofoss, D., & Deilkas, E. (2008). Roadmap for patient safety research: Approaches and roadforks. *Scandinavian Journal of Public Health*, 36(8), 812-817. <http://dx.doi.org/10.1177/1403494808096168>
- Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions, and organisations across nations* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Holden, L. M., Watts, D. D., & Walker, P. H. (2010). Communication and collaboration: It's about the pharmacists, as well as the physicians and nurses. *Quality and Safety in Health Care*, 19(3), 169-172. <http://dx.doi.org/10.1136/qshc.2008.026435>
- Hoskote, S. S., Nadkarni, G. N., Annapureddy, N., Shetty, A. A., & Fried, E. D. (2014). Internal medicine residents' perspectives on effects of 2011 ACGME work hour regulations on patient care. *Teaching and Learning in Medicine*, 26(3), 274-278. <http://dx.doi.org/10.1080/10401334.2014.910458>

- Huang, D. T., Clermont, G., Kong, L., Weissfeld, L. A., Sexton, J. B., Rowan, K. M., & Angus, D. C. (2010). Intensive care unit safety culture and outcomes: A US multicenter study. *International Journal for Quality in Health Care*, 22(3), 151-161. <http://dx.doi.org/10.1093/intqhc/mzq017>
- Huang, D. T., Clermont, G., Sexton, J. B., Karlo, C. A., Miller, R. G., Weissfeld, L. A., . . . Angus, D. C. (2007). Perceptions of safety culture vary across the intensive care units of a single institution. *Critical Care Medicine*, 35(1), 165-176. <http://dx.doi.org/10.1097/01.CCM.0000251505.76026.CF>
- Hudson, P. (2001). Safety management and safety culture the long, hard and winding road. In W. Pearse, C. Gallagher & L. Bluff (Eds.), *Occupational Health and Safety Management Systems Proceedings of the First National Conference* (pp. 3-32). Melbourne, Australia: Crown Content.
- Hudson, P. (2003). Applying the lessons of high risk industries to health care. *Quality and Safety in Health Care*, 12(Suppl 1), i7-i12. http://dx.doi.org/10.1136/qhc.12.suppl_1.i7
- Hughes, R. (2008). *Patient safety and quality: An evidence-based handbook for nurses*. Rockville, MD: AHRQ Publication. Retrieved March 6, 2012, from <http://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/index.html>
- Huis, A., Schoonhoven, L., Grol, R., Donders, R., Hulscher, M., & van Achterberg, T. (2013). Impact of a team and leaders-directed strategy to improve nurses' adherence to hand hygiene guidelines: A cluster randomised trial. *International Journal of Nursing Studies*, 50(4), 464-474. <http://dx.doi.org/10.1016/j.ijnurstu.2012.08.004>
- Hull, L., Arora, S., Kassab, E., Kneebone, R., & Sevdalis, N. (2011). Assessment of stress and teamwork in the operating room: an exploratory study. *American Journal of Surgery*, 201(1), 24-30. <http://dx.doi.org/10.1016/j.amjsurg.2010.07.039>
- Human Engineering. (2005). *A review of safety culture and safety climate literature for the development of the safety culture inspection toolkit*. Bristol, England: Health & Safety Executive. Retrieved March 6, 2012, from <http://www.hse.gov.uk/research/rrpdf/rr367.pdf>

- Hutchinson, A., & Barach, P. (2003). What is the role of health care managers in delivering safe care? *British Medical Journal*, *12*(3), 161-162.
<http://dx.doi.org/10.1136/qhc.12.3.161>
- Hutchinson, A., Cooper, K. L., Dean, J. E., McIntosh, A., Patterson, M., Stride, C. B., . . . Smith, C. M. (2006). Use of a safety climate questionnaire in UK health care: Factor structure, reliability and usability. *Quality and Safety in Health Care*, *15*(5), 347-353. <http://dx.doi.org/10.1136/qshc.2005.016584>
- Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, D.C.: National Academy Press.
- Itoh, K., Abe, T., & Andersen, H. B. (2002). *A survey of safety culture in hospitals including staff attitudes about incident reporting*. Paper presented at the worksop investigation and reporting of incidents and accidents, Glasgow, United Kingdom.
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, *18*(1), 3-20. <http://dx.doi.org/10.1177/1525822X05282260>
- Jackson, J., Sarac, C., & Flin, R. (2010). Hospital safety climate surveys: Measurement issues. *Current Opinion in Critical Care*, *16*(6), 632-638.
<http://dx.doi.org/10.1097/MCC.0b013e32833f0ee6>
- Jackson, M., Chiarello, L. A., Gaynes, R. P., & Gerberding, J. L. (2002). Nurse staffing and health care-associated infections: Proceedings from a working group meeting. *American Journal of Infection Control*, *30*(4), 199-206.
<http://dx.doi.org/10.1067/mic.2002.123416>
- Jain, M., Dogra, V., Mishra, B., Thakur, A., & Loomba, P. (2012). Infection control practices among doctors and nurses in a tertiary care hospital. *Annals of Tropical Medicine and Public Health*, *5*(1), 29-33.
<http://dx.doi.org/10.4103/1755-6783.92877>
- James, J. T. (2013). A new, evidence-based estimate of patient harms associated with hospital care. *Journal of Patient Safety*, *9*(3), 122-128.
<http://dx.doi.org/10.1097/PTS.0b013e3182948a69>
- Jannadi, B., Alshammari, H., Khan, A., & Hussain, R. (2008). Current structure and future challenges for the health care system in Saudi Arabia. *Asia Pacific Journal of Health Management*, *3*(1), 43-50. Retrieved October 20, 2010

from

<http://search.informit.com.au/documentSummary;dn=426956885024415;res=IELHEA>

- Jansma, J. D., Zwart, D. L. M., Leistikow, I. P., Kalkman, C. J., Wagner, C., & Bijnen, A. B. (2010). Do specialty registrars change their attitudes, intentions and behaviours towards reporting incidents following a patient safety course? *BMC Health Services Research, 10*, 100. <http://dx.doi.org/10.1186/1472-6963-10-100>
- Je, S. M., Kim, H. J., You, J. S., Chung, S. P., Cho, J., Lee, J. H., . . . Chung, H. S. (2014). Assessing safety attitudes among health care providers after a hospital-wide high-risk patient care programme. *Yonsei Medical Journal, 55*(1), 523-529. <http://dx.doi.org/10.3349/ymj.2014.55.2.523>
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 1*(2), 112-133. <http://dx.doi.org/10.1177/1558689806298224>
- Johnstone, M. J. (2007). Patient safety ethics and human error management in ED contexts Part I: Development of the global patient safety movement. *Australasian Emergency Nursing Journal, 10*(1), 13-20. <http://dx.doi.org/10.1016/j.aenj.2006.09.002>
- Johnstone, M. J., & Kanitsaki, O. (2006). Culture, language, and patient safety: Making the link. *International Journal for Quality in Health Care, 18*(5), 383-388. <http://dx.doi.org/10.1093/intqhc/mzl039>
- Joint Commission on Accreditation of Healthcare Organisations. (2014). *Sentinel event data: Root causes by event type*. Retrieved October 15, 2014, from http://www.jointcommission.org/Sentinel_Event_Statistics
- Jones, F., Podila, P., & Powers, C. (2013). Creating a culture of safety in the emergency department: The value of teamwork training. *Journal of Nursing Administration, 43*(4), 194-200. <http://dx.doi.org/10.1097/NNA.0b013e31828958cd>
- Kaafarani, H. M., Itani, K. M., Rosen, A. K., Zhao, S., Hartmann, C. W., & Gaba, D. M. (2009). How does patient safety culture in the operating room and post-anesthesia care unit compare to the rest of the hospital? *American Journal of Surgery, 198*(1), 70-75. <http://dx.doi.org/10.1016/j.amjsurg.2008.09.017>

- Kaissi, A., Johnson, T., & Kirschbaum, M. S. (2003). Measuring teamwork and patient safety attitudes of high-risk areas. *Nursing Economics, 21*(5), 211-218. Retrieved from <http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Kalantan, K. A., Al-Taweel, A. A., & Abdul, G. H. (1998). Factors influencing job satisfaction among primary health care (PHC) physicians in Riyadh, Saudi Arabia. *Annals of Saudi Medicine, 19*(5), 424-426. Retrieved March 7, 2014, from http://faculty.ksu.edu.sa/hamza/myfiles/Job_Satisfaction.pdf
- Kalisch, B. J., & Lee, K. H. (2010). The impact of teamwork on missed nursing care. *Nursing Outlook, 58*(5), 233-241.
<http://dx.doi.org/10.1016/j.outlook.2010.06.004>
- Kalisch, B. J., Lee, H., & Salas, E. (2010). The development and testing of the nursing teamwork survey. *Nursing Research, 59*(1), 42-50.
<http://dx.doi.org/10.1097/NNR.0b013e3181c3bd42>
- Kalisch, B. J., Xie, B., & Ronis, D. L. (2013). Train-the-trainer intervention to increase nursing teamwork and decrease missed nursing care in acute care patient units. *Nursing Research, 62*(6), 405-413.
<http://dx.doi.org/10.1097/NNR.0b013e3182a7a15d>
- Kawi, J., & Xu, Y. (2009). Facilitators and barriers to adjustment of international nurses: An integrative review. *International Nursing Review, 56*(2), 174-183.
<http://dx.doi.org/10.1111/j.1466-7657.2008.00705.x>
- Kaya, S., Barsbay, S., & Karabulut, E. (2010). The Turkish version of the safety attitudes questionnaire: Psychometric properties and baseline data. *Quality and Safety in Health Care, 19*(6), 572-577.
<http://dx.doi.org/10.1136/qshc.2008.032003>
- Kemper, P. F., de Bruijne, M., van Dyck, C., & Wagner, C. (2011). Effectiveness of classroom based crew resource management training in the intensive care unit: Study design of a controlled trial. *BMC Health Services Research, 11*, 304. <http://dx.doi.org/10.1186/1472-6963-11-304>
- Khater, W. A., Akhu-Zaheya, L. M., AL-Mahasneh, S. I., & Khater, R. (2015). Nurses' perceptions of patient safety culture in Jordanian hospitals. *International Nursing Review, 62*(1), 82-91.
<http://dx.doi.org/10.1111/inr.12155>

- Khokher, P., Bourgeault, I. L., & Sainsaulieu, I. (2009). Work culture within the hospital context in Canada: Professional versus unit influences. *Journal of Health Organization and Management, 23*(3), 332-345.
<http://dx.doi.org/10.1108/14777260910966753>
- Kim, J., An, K., Kim, M. K., & Yoon, S. H. (2007). Nurses' perception of error reporting and patient safety culture in Korea. *Western Journal of Nursing Research, 29*(7), 827-844. <http://dx.doi.org/10.1177/0193945906297370>
- King, N., & Horrocks, C. (2010). *Interviews in qualitative research*. Los Angeles, CA: Sage Publications.
- Kingston, M. J., Evans, S. M., Smith, B. J., & Berry, J. G. (2004). Attitudes of doctors and nurses towards incident reporting: A qualitative analysis. *The Medical Journal of Australia, 181*(1), 36-39. Retrieved from <https://www.mja.com.au>
- Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (2000). *To err is human: Building a safer health system*. Washington, D.C.: National Academy Press.
- Krill, C., Staffileno, B. A., & Raven, C. (2012). Empowering staff nurses to use research to change practice for safe patient handling. *Nursing Outlook, 60*(3), 157-162. <http://dx.doi.org/10.1016/j.outlook.2011.06.005>
- Krogstad, U., Hofoss, D., & Hjortdahl, P. (2004). Doctor and nurse perception of inter-professional co-operation in hospitals. *International Journal for Quality in Health Care, 16*(6), 491-497. <http://dx.doi.org/10.1093/intqhc/mzh082>
- Kudo, Y., Satoh, T., Kido, S., Watanabe, M., Miki, T., Miyajima, E., . . . Aizawa, Y. (2008). A pilot study testing the dimensions of safety climate among Japanese nurses. *Industrial Health, 46*(2), 158-165.
<http://dx.doi.org/10.2486/indhealth.46.158>
- Kvist, T., Mäntynen, R., Turunen, H., Partanen, P., Miettinen, M., Wolf, G. A., & Vehviläinen-Julkunen, K. (2013). How magnetic are Finnish hospitals measured by transformational leadership and empirical quality outcomes? *Journal of Nursing Management, 21*(1), 152-164.
<http://dx.doi.org/10.1111/j.1365-2834.2012.01456.x>
- Larsen, A. K. (1993). Employee recognition: A working model to enhance job satisfaction. *Association of Perioperative Registered Nurses Journal, 57*(4), 909-912. [http://dx.doi.org/10.1016/S0001-2092\(07\)69092-9](http://dx.doi.org/10.1016/S0001-2092(07)69092-9)

- Lawton, R., & Parker, D. (2002). Barriers to incident reporting in a health care system. *Quality and Safety in Health Care, 11*(1), 15-18.
<http://dx.doi.org/10.1136/qhc.11.1.15>
- Leape, L. L. (2002). Reporting of adverse events. *The New England Journal of Medicine, 347*(20), 1633-1638.
<http://dx.doi.org/10.1056/NEJMNEJMhpr011493>
- Leape, L. L. (2009). Errors in medicine. *Clinica Chimica Acta, 404*(1), 2-5.
<http://dx.doi.org/10.1016/j.cca.2009.03.020>
- Lee, W. C., Wung, H. Y., Liao, H. H., Lo, C. M., Chang, F. L., Wang, P. C., . . . Hou, S. M. (2010). Hospital safety culture in Taiwan: A nationwide survey using Chinese version Safety Attitude Questionnaire. *BMC Health Services Research, 10*, 234. <http://dx.doi.org/10.1186/1472-6963-10-234>
- Leonard, M., Graham, S., & Bonacum, D. (2004). The human factor: The critical importance of effective teamwork and communication in providing safe care. *Quality and Safety in Health Care, 13*(Supp 1), i85-i90.
<http://dx.doi.org/10.1136/qshc.2004.010033>
- Letaief, M., El Mhamdi, S., El-Asady, R., Siddiqi, S., & Abdullatif, A. (2010). Adverse events in a Tunisian hospital: Results of a retrospective cohort study. *International Journal for Quality in Health Care, 22*(5), 380-385.
<http://dx.doi.org/10.1093/intqhc/mzq040>
- Listyowardojo, T. A., Nap, R. E., & Johnson, A. (2012). Variations in hospital worker perceptions of safety culture. *International Journal for Quality in Health Care, 24*(1), 9-15. <http://dx.doi.org/10.1093/intqhc/mzr069>
- Lu, H., While, A. E., & Barriball, K. L. (2005). Job satisfaction among nurses: A literature review. *International Journal of Nursing Studies, 42*(2), 211-227.
<http://dx.doi.org/10.1016/j.ijnurstu.2004.09.003>
- Maamoun, J. (2009). An introduction to patient safety. *Journal of Medical Imaging and Radiation Sciences, 40*(3), 123-133.
<http://dx.doi.org/10.1016/j.jmir.2009.06.002>
- Makary, M. A., Sexton, J. B., Freischlag, J. A., Holzmueller, C. G., Millman, E. A., Rowen, L., & Pronovost, P. J. (2006). Operating room teamwork among physicians and nurses: Teamwork in the eye of the beholder. *Journal of the*

- American College of Surgeons*, 202(5), 746-752.
<http://dx.doi.org/10.1016/j.jamcollsurg.2006.01.017>
- Makary, M. A., Sexton, J. B., Freischlag, J. A., Millman, E. A., Pryor, D., Holzmueller, C., & Pronovost, P. J. (2006). Patient safety in surgery. *Annals of Surgery*, 243(5), 628-635.
<http://dx.doi.org/10.1097/01.sla.0000216410.74062.0f>
- Martijn, L., Harmsen, M., Gaal, S., Mettes, D., van Dulmen, S., & Wensing, M. (2013). Are health professionals' perceptions of patient safety related to figures on safety incidents? *Journal of Evaluation in Clinical Practice*, 19(5), 944-947. <http://dx.doi.org/10.1111/j.1365-2753.2012.01887.x>
- Martowirono, K., Jansma, J. D., Van Luijk, S. J., Wagner, C., & Bijnen, A. B. (2012). Possible solutions for barriers in incident reporting by residents. *Journal of Evaluation in Clinical Practice*, 18(1), 76-81.
<http://dx.doi.org/10.1111/j.1365-2753.2010.01544.x>
- Mathews, J. J., & Nunley, C. (1992). Rejuvenating orientation to increase nurse satisfaction and retention. *Journal of Nursing Staff Development*, 8(4), 159-164. Retrieved from <http://ovidsp.tx.ovid.com.dbgw.lis.curtin.edu.au>
- Matsubara, S., Hagihara, A., & Nobutomo, K. (2008). Development of a patient safety climate scale in Japan. *International Journal for Quality in Health Care*, 20(3), 211-220. <http://dx.doi.org/10.1093/intqhc/mzn003>
- Mayo, A. M., & Duncan, D. (2004). Nurse perceptions of medication errors: What we need to know for patient safety. *Journal of Nursing Care Quality*, 19(3), 209-217. Retrieved from <http://ovidsp.tx.ovid.com.dbgw.lis.curtin.edu.au>
- McCaffrey, R., Hayes, R. M., Cassell, A., Miller-Reyes, S., Donaldson, A., & Ferrell, C. (2012). The effect of an educational programme on attitudes of nurses and medical residents towards the benefits of positive communication and collaboration. *Journal of Advanced Nursing*, 68(2), 293-301.
<http://dx.doi.org/10.1111/j.1365-2648.2011.05736.x>
- McDonald, R., Waring, J., Harrison, S., Walshe, K., & Boaden, R. (2005). Rules and guidelines in clinical practice: A qualitative study in operating theatres of doctors' and nurses' views. *Quality and Safety in Health Care*, 14(4), 290-294. <http://dx.doi.org/10.1136/qshc.2005.013912>

- Mclean, J., & Walsh, M. (2003). Lessons from the inquiry into obstetrics and gynaecology services at King Edward Memorial Hospital 1990-2000. *Australian Health Review*, 26(1), 12-23. <http://dx.doi.org/10.1071/AH030012>
- Mearns, K. J., & Flin, R. (1999). Assessing the state of organisational safety: Culture or climate? *Current Psychology*, 18(1), 5-17. Retrieved from <http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Medical Services Department. (2009a). *Statistics Book for 1430H (2009)*. Alriyadh, Saudi Arabia: MSD Printing Press.
- Medical Services Department. (2009b). *Total quality management (TQM) implementation guidelines in the military health services*. Alriyadh, Saudi Arabia: MSD Printing Press.
- Medical Services Department. (2015). Historical overview. Retrieved October 15, 2011, from <https://msd.med.sa>
- Michel, P., Quenon, J. L., Djihoud, A., Tricaud-Vialle, S., & de Sarasqueta, A. M. (2007). French national survey of inpatient adverse events prospectively assessed with ward staff. *Quality and Safety in Health Care*, 16(5), 369-377. <http://dx.doi.org/10.1136/qshc.2005.016964>
- Ministry of Foreign Affairs. (2013). About Saudi Arabia. Retrieved March 16, 2014, from <http://www.mofa.gov.sa>
- Ministry of Health. (2013). *Health statistics annual book 2013*. Alriyadh, Saudi Arabia: Ministry of Health. Retrieved March 16, 2014, from <http://www.moh.gov.sa>
- Modak, I., Sexton, J. B., Lux, T. R., Helmreich, R. L., & Thomas, E. J. (2007). Measuring safety culture in the ambulatory setting: The safety attitudes questionnaire-ambulatory version. *Journal of General Internal Medicine*, 22(1), 1-5. <http://dx.doi.org/10.1007/s11606-007-0114-7>
- Morath, J. M., & Turnbull, J. E. (2005). *To do no harm*. San Francisco, CA: John Wiley & Sons, Inc.
- Mufti, M. H. (2000). *Health care development strategies in the Kingdom of Saudi Arabia*. Boston, MA: Springer US.
- Munro, B. H. (2005). *Statistical methods for health care research* (5th ed.). Philadelphia: Lippincott Williams & Wilkins.

- Mwachofi, A., Walston, S. L., & Al-Omar, B. A. (2011). Factors affecting nurses' perceptions of patient safety. *International Journal of Health Care Quality Assurance, 24*(4), 274-283. <http://dx.doi.org/10.1108/09526861111125589>
- Nabhan, A., & Ahmed-Tawfik, M. S. (2007). Understanding and attitudes towards patient safety concepts in obstetrics. *International Journal of Gynaecology and Obstetrics, 98*(3), 212-216. <http://dx.doi.org/10.1016/j.ijgo.2007.05.012>
- Najjar, S., Hamdan, M., Euwema, M. C., Vleugels, A., Sermeus, W., Massoud, R., & Vanhaecht, K. (2013). The global trigger tool shows that one out of seven patients suffers harm in Palestinian hospitals: Challenges for launching a strategic safety plan. *International Journal for Quality in Health Care, 25*(6), 640-647. <http://dx.doi.org/10.1093/intqhc/mzt066>
- Narumi, J., Miyazawa, S., Miyata, H., Suzuki, A., Kohsaka, S., & Kosugi, H. (1999). Analysis of human error in nursing care. *Accident Analysis and Prevention, 31*(6), 625-629. [http://dx.doi.org/10.1016/S0001-4575\(99\)00021-4](http://dx.doi.org/10.1016/S0001-4575(99)00021-4)
- Needleman, J., Buerhaus, P., Pankratz, S., Leibson, C. L., Stevens, S. R., & Harris, M. (2011). Nurse staffing and inpatient hospital mortality. *The New England Journal of Medicine, 364*(11), 1037-1045. <http://dx.doi.org/10.1056/NEJMc1104381>
- Nelson, D. L., & Quick, J. C. (2003). *Organisational behaviour: Foundations, realities, and challenges* (4th ed.). Mason, Ohio: Thomson.
- Nie, Y., Mao, X., Cui, H., He, S., Li, J., & Zhang, M. (2013). Hospital survey on patient safety culture in China. *BMC Health Services Research, 13*, 228. <http://dx.doi.org/10.1186/1472-6963-13-228>
- Nieva, V. F., & Sorra, J. (2003). Safety culture assessment: A tool for improving patient safety in health care organizations. *Quality and Safety in Health Care, 12*(Suppl 2), ii17-ii23. http://dx.doi.org/10.1136/qhc.12.suppl_2.ii17
- Nilsson, L., Lindberget, O., Gupta, A., & Vegfors, M. (2010). Implementing a pre-operative checklist to increase patient safety: A 1-year follow-up of personnel attitudes. *Acta Anaesthesiologica Scandinavica, 54*(2), 176-182. <http://dx.doi.org/10.1111/j.1399-6576.2009.02109.x>
- Nocera, A., & Khursandi, D. S. (1998). Doctors' working hours: Can the medical profession afford to let the courts decide what is reasonable? *The Medical*

- Journal of Australia*, 168(12), 616-618. Retrieved from <https://www-mja-com-au.dbgw.lis.curtin.edu.au>
- O'Daniel, M., & Rosenstein, A. H. (2008). Professional communication and team collaboration. In R. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses* (Vol. No. 08-0043). Rockville, MD: AHRQ Publication. Retrieved March 6, 2012, from <http://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/index.html>
- O'Leary, K. J., Ritter, C. D., Wheeler, H., Szekendi, M. K., Brinton, T. S., & Williams, M. V. (2010). Teamwork on inpatient medical units: Assessing attitudes and barriers. *Quality and safety in health care*, 19(2), 117-121. <http://dx.doi.org/10.1136/qshc.2008.028795>
- O'Leary, K. J., Wayne, D. B., Haviley, C., Slade, M. E., Lee, J., & Williams, M. V. (2010). Improving teamwork: Impact of structured interdisciplinary rounds on a medical teaching unit. *Journal of General Internal Medicine*, 25(8), 826-832. Retrieved from <http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Organization of the Petroleum Exporting Countries. (2015). Saudi Arabia facts and figures. Retrieved February 26, 2015, from http://www.opec.org/opec_web/en/about_us/169.htm
- Øvretveit, J. (2009). Understanding and improving patient safety: The psychological, social and cultural dimensions. *Journal of Health Organization and Management*, 23(6), 581-596. <http://dx.doi.org/10.1108/14777260911001617>
- Owens, D. L., Turjanica, M. A., Scanion, M. W., Sandhusen, A. E., Williamson, M., Herbert, C., & Facticeau, L. (2001). New graduate RN internship programme: A collaborative approach for system-wide integration. *Journal for Nurses in Staff Development*, 17(3), 144-150. Retrieved from <http://ovidsp.tx.ovid.com.dbgw.lis.curtin.edu.au>
- Page, A. (2004). *Keeping patients safe: transforming the work environment of nurses*. Washington, D.C.: National Academies Press.
- Parand, A., Burnett, S., Benn, J., Pinto, A., Iskander, S., & Vincent, C. (2011). The disparity of frontline clinical staff and managers' perceptions of a quality and patient safety initiative. *Journal of Evaluation in Clinical Practice*, 17(6), 1184-1190. <http://dx.doi.org/10.1111/j.1365-2753.2010.01506.x>

- Parker, D., & Hudson, P. (2001). HSE: Understanding your culture. Retrieved January 10, 2015, from <http://www.eimicrosites.org/heartsandminds/culture.php>
- Parker, D., Lawrie, M., & Hudson, P. (2006). A framework for understanding the development of organisational safety culture. *Safety Science*, *44*(6), 551-562. <http://dx.doi.org/10.1016/j.ssci.2005.10.004>
- Parry, G., Horowitz, L., & Goldmann, D. (2009). Patient safety attitudes of paediatric trainee physicians. *Quality and Safety in Health Care*, *18*(6), 462-466. <http://dx.doi.org/10.1136/qshc.2006.020230>
- Patterson, M. D., Geis, G. L., LeMaster, T., & Wears, R. L. (2013). Impact of multidisciplinary simulation-based training on patient safety in a paediatric emergency department. *BMJ Quality and Safety*, *22*(5), 383-393. <http://dx.doi.org/10.1136/bmjqs-2012-000951>
- Patterson, P. D., Huang, D. T., Fairbanks, R. J., & Wang, H. E. (2010). The emergency medical services safety attitudes questionnaire. *American Journal of Medical Quality*, *25*(2), 109-115. <http://dx.doi.org/10.1177/1062860609352106>
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Pearson, A., & Aromataris, E. (2009). *Patient safety in primary health care : A review of the literature*. Adelaide, Australia: The Joanna Briggs Institute. Retrieved June 2, 2011, from <http://www.safetyandquality.gov.au/publications-resources/publications>
- Pecukonis, E., Doyle, O., & Bliss, D. L. (2008). Reducing barriers to interprofessional training: Promoting interprofessional cultural competence. *Journal of Interprofessional Care*, *22*(4), 417-428. <http://dx.doi.org/10.1080/13561820802190442>
- Petrova, E., Baldacchino, D., & Camilleri, M. (2010). Nurses' perceptions of medication errors in Malta. *Nursing Standard*, *24*(33), 41-48. <http://dx.doi.org/10.7748/ns2010.04.24.33.41.c7717>
- Pettker, C. M., Thung, S. F., Raab, C. A., Donohue, K. P., Copel, J. A., Lockwood, C. J., & Funai, E. F. (2011). A comprehensive obstetrics patient safety programme improves safety climate and culture. *American Journal of*

- Obstetrics and Gynecology*, 204(3), 216-211.
<http://dx.doi.org/10.1016/j.ajog.2010.11.004>
- Pittet, D. (2001). Compliance with hand disinfection and its impact on hospital-acquired infections. *Journal of Hospital Infection*, 48(Suppl A), S40-S46.
[http://dx.doi.org/10.1016/S0195-6701\(01\)90012-X](http://dx.doi.org/10.1016/S0195-6701(01)90012-X)
- Pittet, D. (2003). Hand hygiene: Improved standards and practice for hospital care. *Current Opinion in Infectious Diseases*, 16(4), 327-335.
<http://dx.doi.org/10.1097/01.qco.0000083564.72029.27>
- Pittet, D. (2005). Infection control and quality health care in the new millennium. *American Journal of Infection Control*, 33(5), 258-267.
<http://dx.doi.org/10.1016/j.ajic.2004.11.004>
- Pittet, D., Hugonnet, S., Harbarth, S., Mourouga, P., Sauvan, V., Touveneau, S., & Perneger, T. V. (2000). Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *The Lancet*, 356(9238), 1307-1312.
[http://dx.doi.org/10.1016/S0140-6736\(00\)02814-2](http://dx.doi.org/10.1016/S0140-6736(00)02814-2)
- Pittet, D., Mourouga, P., & Perneger, T. V. (1999). Compliance with handwashing in a teaching hospital. *Annals of Internal Medicine*, 130(2), 153-155.
<http://dx.doi.org/10.7326/0003-4819-130-2-199901190-00006>
- Poley, M. J., van der Starre, C., van den Bos, A., van Dijk, M., & Tibboel, D. (2011). Patient safety culture in a Dutch pediatric surgical intensive care unit: An evaluation using the Safety Attitudes Questionnaire. *Pediatric critical care medicine*, 12(6), e310-e316.
<http://dx.doi.org/10.1097/PCC.0b013e318220afca>
- Polgar, S., & Thomas, S. A. (2008). *Introduction to research in the health sciences* (5th ed.). Edinburgh, England: Churchill Livingstone Elsevier.
- Potylycki, M. J., Kimmel, S. R., Ritter, M., Capuano, T., Gross, L., Riegel-Gross, K., & Panik, A. (2006). Nonpunitive medication error reporting 3-year findings from one hospital's primum non nocere initiative. *Journal of Nursing Administration*, 36(7-8), 370-376. Retrieved from
<http://ovidsp.tx.ovid.com.dbgw.lis.curtin.edu.au>
- Pringle, J., Weber, R. J., Rice, K., Kirisci, L., & Sirio, C. (2009). Examination of how a survey can spur culture changes using a quality improvement approach: A region-wide approach to determining a patient safety culture.

- American Journal of Medical Quality*, 24(5), 374-384.
<http://dx.doi.org/10.1177/1062860609336367>
- Profit, J., Etchegaray, J., Petersen, L. A., Sexton, J. B., Hysong, S. J., Mei, M., & Thomas, E. J. (2012a). Neonatal intensive care unit safety culture varies widely. *Archives of Disease in Childhood-Fetal and Neonatal Edition*, 97(2), F120-126. <http://dx.doi.org/10.1136/archdischild-2011-300635>
- Profit, J., Etchegaray, J., Petersen, L. A., Sexton, J. B., Hysong, S. J., Mei, M., & Thomas, E. J. (2012b). The Safety Attitudes Questionnaire as a tool for benchmarking safety culture in the NICU. *Archives of Disease in Childhood-Fetal and Neonatal Edition*, 97(2), F127-132.
<http://dx.doi.org/10.1136/archdischild-2011-300612>
- Pronovost, P., & Sexton, B. (2005). Assessing safety culture: Guidelines and recommendations. *Quality and Safety in Health Care*, 14(4), 231-233.
<http://dx.doi.org/10.1136/qshc.2005.015180>
- Pronovost, P. J., Angus, D. C., Dorman, T., Robinson, K. A., Dremiszov, T. T., & Young, T. L. (2002). Physician staffing patterns and clinical outcomes in critically ill patients. *The Journal of the American Medical Association*, 288(17), 2151-2162. <http://dx.doi.org/10.1001/jama.288.17.2151>
- Pronovost, P. J., Berenholtz, S. M., Goeschel, C., Thom, I., Watson, S. R., Holzmueller, C. G., . . . Sexton, J. B. (2008). Improving patient safety in intensive care units in Michigan. *Journal of Critical Care*, 23(2), 207-221.
<http://dx.doi.org/10.1016/j.jcrc.2007.09.002>
- Pronovost, P. J., Weast, B., Holzmueller, C. G., Rosenstein, B. J., Kidwell, R. P., Haller, K. B., . . . Rubin, H. R. (2003). Evaluation of the culture of safety: Survey of clinicians and managers in an academic medical center. *Quality and Safety in Health Care*, 12(6), 405-410.
<http://dx.doi.org/10.1136/qhc.12.6.405>
- Pullon, S. (2008). Competence, respect and trust: Key features of successful interprofessional nurse-doctor relationships. *Journal of Interprofessional Care*, 22(2), 133-147. <http://dx.doi.org/10.1080/13561820701795069>
- Qu, S. Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative Research in Accounting and Management*, 8(3), 238-264.
<http://dx.doi.org/10.1108/11766091111162070>

- Raftopoulos, V., & Pavlakis, A. (2013). Safety climate in 5 intensive care units: A nationwide hospital survey using the Greek-Cypriot version of the safety attitudes questionnaire. *Journal of Critical Care, 28*(1), 51-61.
<http://dx.doi.org/10.1016/j.jcrc.2012.04.013>
- Raftopoulos, V., Savva, N., & Papadopoulou, M. (2011). Safety culture in the maternity units: A census survey using the Safety Attitudes Questionnaire. *BMC Health Services Research, 11*, 238. <http://dx.doi.org/10.1186/1472-6963-11-238>
- Reader, T. W., Flin, R., Mearns, K., & Cuthbertson, B. H. (2007). Interdisciplinary communication in the intensive care unit. *British Journal of Anaesthesia, 98*(3), 347-352. <http://dx.doi.org/10.1093/bja/ael372>
- Reason, J. (2000). Human error: Models and management. *The Western Journal of Medicine, 320*(7237), 768-770. <http://dx.doi.org/10.1136/bmj.320.7237.768>
- Reason, J. T. (1997). *Managing the risks of organizational accidents*. Aldershot, England: Ashgate.
- Relihan, E., Glynn, S., Daly, D., Silke, B., & Ryder, S. (2009). Measuring and benchmarking safety culture: Application of the safety attitudes questionnaire to an acute medical admissions unit. *Irish Journal of Medical Science, 178*(4), 433-439. <http://dx.doi.org/10.1007/s11845-009-0352-2>
- Rhodes, P., Giles, S. J., Cook, G. A., Grange, A., Hayton, R., Maxwell, M. J., . . . Wright, J. (2008). Assessment of the implementation of a national patient safety alert to reduce wrong site surgery. *Quality and Safety in Health Care, 17*(6), 409-415. <http://dx.doi.org/10.1136/qshc.2007.023010>
- Robb, G., & Seddon, M. (2010). Measuring the safety culture in a hospital setting: A concept whose time has come? *The New Zealand Medical Journal, 123*(1314), 66-76. Retrieved from <https://www.nzma.org.nz/journal>
- Robbins, S. P. (1996). *Organizational behavior: Concepts, controversies, applications* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.
- Roberts, L., Bolton, P., & Asman, S. (1998). Compliance of hand washing practices: Theory versus practice. *Australian Health Review, 21*(4), 238-244.
<http://dx.doi.org/10.1071/AH980238>
- Robinson, A. R., Hohmann, K. B., Rifkin, J. I., Topp, D., Gilroy, C. M., Pickard, J. A., & Anderson, R. J. (2002). Physician and public opinions on quality of

- health care and the problem of medical errors. *Archives of Internal Medicine*, 162(19), 2186-2190. <http://dx.doi.org/10.1001/archinte.162.19.2186>
- Rydenfält, C., Johansson, G., Odenrick, P., Åkerman, K., & Larsson, P. A. (2013). Compliance with the WHO Surgical Safety Checklist: Deviations and possible improvements. *International Journal for Quality in Health Care*, 25(2), 182-187. <http://dx.doi.org/10.1093/intqhc/mzt004>
- Samarkandi, A. (2006). Status of medical liability claims in Saudi Arabia. *Annals of Saudi Medicine*, 26(2), 87-91. Retrieved March 6, 2012, from http://applications.emro.who.int/imemrf/Ann_Saudi_Med/2006_26_2_87.pdf
- Sanghera, I. S., Franklin, B. D., & Dhillon, S. (2007). The attitudes and beliefs of health care professionals on the causes and reporting of medication errors in a UK intensive care unit. *Anaesthesia*, 62(1), 53-61. <http://dx.doi.org/10.1111/j.1365-2044.2006.04858.x>
- Saudi Central Board for Accreditation of Health Care Institutions. (2015). Tasks and responsibilities. Retrieved January 10, 2015 from <http://www.cbahi.org/apps/en/about-cbahi/tasks-and-responsibilities.aspx>
- Sax, H. C., Browne, P., Mayewski, R. J., Panzer, R. J., Hittner, K. C., Burke, R. L., & Coletta, S. (2009). Can aviation-based team training elicit sustainable behavioral change? *Archives of Surgery*, 144(12), 1133-1137. <http://dx.doi.org/10.1001/archsurg.2009.207>
- Schermerhorn, J. R., Hunt, J. G., & Osborn, R. N. (1994). *Managing organizational behavior* (5th ed.). Chichester, NY: John Wiley & Sons.
- Schmidt, C. E., & Bottoni, T. (2003). Improving medication safety and patient care in the emergency department. *Journal of Emergency Nursing*, 29(1), 12-16. <http://dx.doi.org/10.1067/men.2003.19>
- Schwappach, D. L., Frank, O., & Davis, R. E. (2013). A vignette study to examine health care professionals' attitudes towards patient involvement in error prevention. *Journal of Evaluation in Clinical Practice*, 19(5), 840-848. <http://dx.doi.org/10.1111/j.1365-2753.2012.01861.x>
- Sexton, J. B., Berenholtz, S. M., Goeschel, C. A., Watson, S. R., Holzmueller, C. G., Thompson, D. A., . . . Pronovost, P. J. (2011). Assessing and improving safety climate in a large cohort of intensive care units. *Critical Care*

- Medicine*, 39(5), 934-939.
<http://dx.doi.org/10.1097/CCM.0b013e318206d26c>
- Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., . . . Thomas, E. J. (2006). The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, 6, 44. <http://dx.doi.org/10.1186/1472-6963-6-44>
- Sexton, J. B., Holzmueller, C. G., Pronovost, P. J., Thomas, E. J., McFerran, S., Nunes, J., . . . Fox, H. E. (2006). Variation in caregiver perceptions of teamwork climate in labor and delivery units. *Journal of Perinatology*, 26(8), 463-470. <http://dx.doi.org/10.1038/sj.jp.7211556>
- Sexton, J. B., Makary, M. A., Tersigni, A. R., Pryor, D., Hendrich, A., Thomas, E. J., . . . Pronovost, P. J. (2006). Teamwork in the operating room: Frontline perspectives among hospitals and operating room personnel. *Anesthesiology*, 105(5), 877-884. <http://dx.doi.org/10.1097/00000542-200611000-00006>
- Sexton, J. B., Thomas, E. J., & Grillo, S. P. (2003). *The Safety Attitudes Questionnaire (SAQ) guidelines for administration. Technical Report 03-02*. Texas: The University of Texas Center of Excellence for Patient Safety Research and Practice. Retrieved September 12, 2010 from http://www.uth.tmc.edu/schools/med/imed/patient_safety/products.html
- Sexton, J. B., Thomas, E. J., & Helmreich, R. L. (2000). Error, stress, and teamwork in medicine and aviation: Cross sectional surveys. *British Medical Journal*, 320(7237), 745-749. <http://dx.doi.org/10.1136/bmj.320.7237.745>
- Sexton, J. B., Thomas, E. J., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., . . . Roberts, P. R. (2004). *Frontline assessments of health care culture: Safety Attitudes Questionnaire norms and psychometric properties. Technical Report 04-01*. Austin: The University of Texas Center of Excellence for Patient Safety Research and Practice. AHRQ Grant #1PO1HS1154401. Retrieved September 12, 2010, from <http://psnet.ahrq.gov/resource.aspx?resourceID=1439>
- Shaw, K. N., Ruddy, R. M., Olsen, C. S., Lillis, K. A., Mahajan, P. V., Dean, J. M., & Chamberlain, J. M. (2009). Pediatric patient safety in emergency departments: Unit characteristics and staff perceptions. *Pediatrics*, 124(2), 485-493. <http://dx.doi.org/10.1542/peds.2008-2858>

- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63-75. Retrieved from <http://content.iospress.com.dbgw.lis.curtin.edu.au>
- Siemsen, I. M. D., Madsen, M. D., Pedersen, L. F., Michaelsen, L., Pedersen, A. V., Andersen, H. B., & Østergaard, D. (2012). Factors that impact on the safety of patient handovers: An interview study. *Scandinavian Journal of Public Health*, 40(5), 439-448. <http://dx.doi.org/10.1177/1403494812453889>
- Singer, S. J., Falwell, A., Gaba, D. M., & Baker, L. C. (2008). Patient safety climate in US hospitals: Variation by management level. *Medical Care*, 46(11), 1149-1156. <http://dx.doi.org/10.1097/MLR.0b013e31817925c1>
- Singer, S. J., Gaba, D. M., Falwell, A., Lin, S., Hayes, J., & Baker, L. (2009). Patient safety climate in 92 US hospitals: Differences by work area and discipline. *Medical Care*, 47(1), 23-31. <http://dx.doi.org/10.1097/MLR.0b013e31817e189d>
- Singer, S. J., Gaba, D. M., Geppert, J. J., Sinaiko, A. D., Howard, S. K., & Park, K. C. (2003). The culture of safety: Results of an organisation-wide survey in 15 California hospitals. *Quality and Safety in Health Care*, 12(2), 112-118. <http://dx.doi.org/10.1136/qhc.12.2.112>
- Singer, S., Meterko, M., Baker, L., Gaba, D., Falwell, A., & Rosen, A. (2007). Workforce perceptions of hospital safety culture: Development and validation of the patient safety climate in health care organizations survey. *Health Services Research*, 42(5), 1999-2021. <http://dx.doi.org/10.1111/j.1475-6773.2007.00706.x>
- Singla, A. K., Kitch, B. T., Weissman, J. S., & Campbell, E. G. (2006). Assessing patient safety culture: A review and synthesis of the measurement tools. *Journal of Patient Safety*, 2(3), 105-115. <http://dx.doi.org/10.1097/01.jps.0000235388.39149.5a>
- Smetzer, J. L., Vaida, A. J., Cohen, M. R., Trantum, D., Pittman, M. A., & Armstrong, C. W. (2003). Findings from the ISMP Medication Safety Self-Assessment for hospitals. *Joint Commission Journal on Quality and Safety*, 29(11), 586-597. Retrieved February 23, 2015, from <http://www.ismp.org/survey/JCAssessment200311Smetzer.pdf>

- Smits, M., Christiaans-Dingelhoff, I., Wagner, C., van der Wal, G., & Groenewegen, P. P. (2008). The psychometric properties of the 'Hospital Survey on Patient Safety Culture' in Dutch hospitals. *BMC Health Services Research*, 8, 230. <http://dx.doi.org/10.1186/1472-6963-8-230>
- Smits, M., Wagner, C., Spreeuwenberg, P., van der Wal, G., & Groenewegen, P. P. (2009). Measuring patient safety culture: An assessment of the clustering of responses at unit level and hospital level. *Quality and Safety in Health Care*, 18(4), 292-296. <http://dx.doi.org/10.1136/qshc.2007.025965>
- Sorokin, R., Riggio, J. M., Moleski, S., & Sullivan, J. (2011). Physicians-in-training attitudes on patient safety: 2003 to 2008. *Journal of Patient Safety*, 7(3), 133-138. <http://dx.doi.org/10.1097/PTS.0b013e31822a9c5e>
- Sorra, J., & Nieva, V. (2004). *Hospital Survey on Patient Safety Culture. (Prepared by Westat, under Contract No. 290-96-0004). AHRQ Publication No. 04-0041*. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved March 6, 2012, from <http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital>
- Sorra, J., Nieva, V., Fastman, B. R., Kaplan, H., Schreiber, G., & King, M. (2008). Staff attitudes about event reporting and patient safety culture in hospital transfusion services. *Transfusion*, 48(9), 1934-1942. <http://dx.doi.org/10.1111/j.1537-2995.2008.01761.x>
- Speroff, T., Nwosu, S., Greevy, R., Weinger, M. B., Talbot, T. R., Wall, R. J., . . . Dittus, R. S. (2010). Organisational culture: Variation across hospitals and connection to patient safety climate. *Quality and Safety in Health Care*, 19(6), 592-596. <http://dx.doi.org/10.1136/qshc.2009.039511>
- Stein, A. D., Makarawo, T. P., & Ahmad, M. F. R. (2003). A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *Journal of Hospital Infection*, 54(1), 68-73. [http://dx.doi.org/10.1016/S0195-6701\(03\)00074-4](http://dx.doi.org/10.1016/S0195-6701(03)00074-4)
- Stone, P. W., Mooney-Kane, C., Larson, E. L., Horan, T., Glance, L. G., Zwanziger, J., & Dick, A. W. (2007). Nurse working conditions and patient safety outcomes. *Medical Care*, 45(6), 571-578. <http://dx.doi.org/10.1097/MLR.0b013e3180383667>

- Stratton, K. M., Blegen, M. A., Pepper, G., & Vaughn, T. (2004). Reporting of medication errors by pediatric nurses. *Journal of Pediatric Nursing, 19*(6), 385-392. <http://dx.doi.org/10.1016/j.pedn.2004.11.007>
- Sutcliffe, K. M., Lewton, E., & Rosenthal, M. M. (2004). Communication failures: An insidious contributor to medical mishaps. *Academic Medicine, 79*(2), 186-194. Retrieved from <http://ovidsp.tx.ovid.com.dbgw.lis.curtin.edu.au>
- Sutker, W. L. (2008). The physician's role in patient safety: What's in it for me? *Proceedings (Baylor University. Medical Center), 21*(1), 9-14. Retrieved from <http://web.a.ebscohost.com.dbgw.lis.curtin.edu.au>
- Taher, S., Hejaili, F., Karkar, A., Shaheen, F., Barahmien, M., Al Saran, K., . . . Al Sayyari, A. A. (2014). Safety climate in dialysis centers in Saudi Arabia: A multicenter study. *Journal of Patient Safety, 10*(2), 101-104. <http://dx.doi.org/10.1097/PTS.0000000000000111>
- Tai, J. W. M., Mok, E. S. B., Ching, P. T. Y., Seto, W. H., & Pittet, D. (2009). Nurses and physicians' perceptions of the importance and impact of health care-associated infections and hand hygiene: A multi-center exploratory study in Hong Kong. *Infection, 37*(4), 320-333. <http://dx.doi.org/10.1007/s15010-009-8245-x>
- Taylor, J. A., & Pandian, R. (2013). A dissonant scale: Stress recognition in the SAQ. *BMC Research Notes, 6*, 302. <http://dx.doi.org/10.1186/1756-0500-6-302>
- Tenna, A., Stenehjem, E. A., Margoles, L., Kacha, E., Blumberg, H. M., & Kempker, R. R. (2013). Infection control knowledge, attitudes, and practices among health care workers in Addis Ababa, Ethiopia. *Infection Control and Hospital Epidemiology, 34*(12), 1289-1296. <http://dx.doi.org/10.1086/673979>
- Thomas, E. J., Sexton, J. B., & Helmreich, R. L. (2003). Discrepant attitudes about teamwork among critical care nurses and physicians. *Critical Care Medicine, 31*(3), 956-959. <http://dx.doi.org/10.1097/01.CCM.0000056183.89175.76>
- Thomas, E. J., Sexton, J. B., Neilands, T. B., Frankel, A., & Helmreich, R. L. (2005). The effect of executive walk rounds on nurse safety climate attitudes: A randomized trial of clinical units. *BMC Health Services Research, 5*, 28. <http://dx.doi.org/10.1186/1472-6963-5-28>

- Thomas, E. J., Sherwood, G. D., Mulhollem, J. L., Sexton, J. B., & Helmreich, R. L. (2004). Working together in the neonatal intensive care unit: Provider perspectives. *Journal of Perinatology*, *24*(9), 552-559.
<http://dx.doi.org/10.1038/sj.jp.7211136>
- Thompson, D. N., Hoffman, L. A., Sereika, S. M., Lorenz, H. L., Wolf, G. A., Burns, H. K., . . . Ramanujam, R. (2011). A relational leadership perspective on unit-level safety climate. *Journal of Nursing Administration*, *41*(11), 479-487.
<http://dx.doi.org/10.1097/NNA.0b013e3182346e31>
- Throckmorton, T., & Etchegaray, J. (2007). Factors affecting incident reporting by registered nurses: The relationship of perceptions of the environment for reporting errors, knowledge of the nursing practice act, and demographics on intent to report errors. *Journal of PeriAnesthesia Nursing*, *22*(6), 400-412.
<http://dx.doi.org/10.1016/j.jopan.2007.09.006>
- Tunis, S. R., Hayward, R. S., Wilson, M. C., Rubin, H. R., Bass, E. B., Johnston, M., & Steinberg, E. P. (1994). Internists' attitudes about clinical practice guidelines. *Annals of Internal Medicine*, *120*(11), 956-963.
<http://dx.doi.org/10.7326/0003-4819-120-11-199406010-00008>
- Tzeng, H. M. (2002). Satisfying nurses on job factors they care about: A Taiwanese perspective. *Journal of Nursing Administration*, *32*(6), 306-309.
<http://dx.doi.org/10.1097/00005110-200206000-00005>
- Uddin, S. G., Marsteller, J. A., Sexton, J. B., Will, S. E., & Fox, H. E. (2012). Provider attitudes toward clinical protocols in obstetrics. *American Journal of Medical Quality*, *27*(4), 335-340.
<http://dx.doi.org/10.1177/1062860611422757>
- University of Texas. (2015). Saudi Arabia Maps. Retrieved January 26, 2015, from http://www.lib.utexas.edu/maps/saudi_arabia.html
- University of Texas: Centre for Health Care Quality & Safety. (n.d.). Safety Attitudes Questionnaire Scale Computation instructions. Retrieved November 14, 2011, from <https://med.uth.edu/chqs/surveys/safety-attitudes-and-safety-climate-questionnaire>
- Vaismoradi, M., Salsali, M., Esmaeilpour, M., & Cheraghi, M. A. (2011). Perspectives and experiences of Iranian nurses regarding nurse-physician

- communication: A content analysis study. *Japan Journal of Nursing Science*, 8(2), 184-193. <http://dx.doi.org/10.1111/j.1742-7924.2011.00173.x>
- Verbakel, N. J., Zwart, D. L., Langelaan, M., Verheij, T. J., & Wagner, C. (2013). Measuring safety culture in Dutch primary care: Psychometric characteristics of the SCOPE-PC questionnaire. *BMC Health Services Research*, 13, 354. <http://dx.doi.org/10.1186/1472-6963-13-354>
- Verbeek-Van Noord, I., Wagner, C., Van Dyck, C., Twisk, J. W. R., & De Bruijne, M. C. (2014). Is culture associated with patient safety in the emergency department? A study of staff perspectives. *International Journal for Quality in Health Care*, 26(1), 64-70. <http://dx.doi.org/10.1093/intqhc/mzt087>
- Vertino, K. A. (2014). Evaluation of a TeamSTEPPS® initiative on staff attitudes toward teamwork. *Journal of Nursing Administration*, 44(2), 97-102. <http://dx.doi.org/10.1097/NNA.0000000000000032>
- Vicca, A. F. (1999). Nursing staff workload as a determinant of methicillin-resistant *Staphylococcus aureus* spread in an adult intensive therapy unit. *Journal of Hospital Infection*, 43(2), 109-113. <http://dx.doi.org/10.1053/jhin.1999.0246>
- Vincent, C. (2010). *Patient safety* (2nd ed.). Hoboken, NJ: Wiley-Blackwell.
- Vincent, C., Taylor-Adams, S., & Stanhope, N. (1998). Framework for analysing risk and safety in clinical medicine. *British Medical Journal*, 316(7138), 1154-1157. <http://dx.doi.org/10.1136/bmj.316.7138.1154>
- Wachter, R. M. (2008). *Understanding patient safety*. New York: McGraw-Hill Medical.
- Wagner, C. (2008). The role of patient safety culture. In M. McCarthy & M. Brookes (Eds.), *Patient safety research: European research reviews*. London, England: United Kingdom Faculty of Public Health. Retrieved November 6, 2011, from http://www.cepral-sante.fr/document/Wagner_role_patient_safety_culture.pdf
- Walston, S., Al-Harbi, Y., & Al-Omar, B. (2008). The changing face of health care in Saudi Arabia. *Annals of Saudi Medicine*, 28(4), 243-250. Retrieved from <http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Walston, S. L., Al-Omar, B. A., & Al-Mutari, F. A. (2010). Factors affecting the climate of hospital patient safety: A study of hospitals in Saudi Arabia.

- International Journal of Health Care Quality Assurance*, 23(1), 35-50.
Retrieved from <http://search.proquest.com.dbgw.lis.curtin.edu.au>
- Watts, B. V., Percarpio, K., West, P., & Mills, P. D. (2010). Use of the Safety Attitudes Questionnaire as a measure in patient safety improvement. *Journal of Patient Safety*, 6(4), 206-209.
<http://dx.doi.org/10.1097/PTS.0b013e3181fbbe86>
- Weaver, M. D., Wang, H. E., Fairbanks, R. J., & Patterson, D. (2012). The association between EMS workplace safety culture and safety outcomes. *Prehospital Emergency Care*, 16(1), 43-52.
<http://dx.doi.org/10.3109/10903127.2011.614048>
- Weingart, S. N., Farbstein, K., Davis, R. B., & Phillips, R. S. (2004). Using a multihospital survey to examine the safety culture. *Joint Commission journal on quality and safety*, 30(3), 125-132. Retrieved February 15, 2015, from <http://www.ingentaconnect.com>
- Westbrook, M. T., Braithwaite, J., Travaglia, J. F., Long, D., Jorm, C., Iedema, R. A., & Ledema, R. A. (2007). Promoting safety: Longer-term responses of three health professional groups to a safety improvement programme. *International Journal of Health Care Quality Assurance*, 20(7), 555-571.
<http://dx.doi.org/10.1108/09526860710822707>
- Wiegmann, D. A., Zhang, H., Thaden, T. L. V., Sharma, G., & Gibbons, A. M. (2004). Safety culture: An integrative review. *International Journal of Aviation Psychology*, 14(2), 117-134.
http://dx.doi.org/10.1207/s15327108ijap1402_1
- Wilson, B., Bekker, H. L., & Fylan, F. (2008). Reporting of clinical adverse events scale: A measure of doctor and nurse attitudes to adverse event reporting. *Quality and Safety in Health Care*, 17(5), 364-367.
<http://dx.doi.org/10.1136/qshc.2006.021691>
- Wilson, R. M., Michel, P., Olsen, S., Gibberd, R. W., Vincent, C., El-Assady, R., . . . Larizgoitia, I. (2012). Patient safety in developing countries: Retrospective estimation of scale and nature of harm to patients in hospital. *British Medical Journal*, 344(7850), e832. <http://dx.doi.org/10.1136/bmj.e832>
- Withers, J., & Snowball, J. (2003). Adapting to a new culture: A study of the expectations and experiences of Filipino nurses in the Oxford Radcliffe

- Hospitals NHS Trust. *Nursing Times Research*, 8(4), 278-290.
<http://dx.doi.org/10.1177/136140960300800405>
- Wolff, A., & Taylor, S. (2009). *Enhancing patient care: A practical guide to improving quality and safety in hospitals*. Sydney, Australia: Australian Medical Publishing Company Limited (AMPCo).
- Wong, J., & Beglaryan, H. (2004). *Strategies for hospitals to improve patient safety: A review of the research*. Toronto, Canada: The Change Foundation.
Retrieved October 11, 2011, from
<http://psnet.ahrq.gov/resource.aspx?resourceID=1341>
- World Health Organization. (2005a). *Technical paper: Regional strategy for enhancing patient safety*. Retrieved October 11, 2011 from
http://applications.emro.who.int/docs/EM_RC52_4_en.pdf
- World Health Organization. (2005b). *World Alliance for Patient Safety, Global patient safety challenge 2005–2006: Clean care is safer care*. Geneva, Switzerland: WHO Press. Retrieved March 6, 2012 from <http://www.who.int>
- World Health Organization. (2006). *Health system profile- Saudi Arabia*. Retrieved April 11, 2012 from
<http://apps.who.int/medicinedocs/documents/s17308e/s17308e.pdf>
- World Health Organization. (2012). Stress at the workplace. Retrieved June 23, 2014 from http://www.who.int/occupational_health/topics/stressatwp/en
- Xu, Y. (2005). Clinical challenges of Asian nurses in a foreign health care environment. *Home Health Care Management and Practice*, 17(6), 492-494.
<http://dx.doi.org/10.1177/1084822305278127>
- Zakari, N. M. (2011). Attitude of academic ambulatory nurses toward patient safety culture in Saudi Arabia. *Life Science Journal*, 8(3), 230-237. Retrieved from <http://www.lifesciencesite.com/ljsj>
- Zhu, J., Li, L., Li, Y., Shi, M., Lu, H., Garnick, D. W., & Weingart, S. N. (2012). What constitutes patient safety culture in Chinese hospitals? *International Journal for Quality in Health Care*, 24(3), 250-257.
<http://dx.doi.org/10.1093/intqhc/mzs010>
- Zimmermann, N., Küng, K., Sereika, S. M., Engberg, S., Sexton, B., & Schwendimann, R. (2013). Assessing the Safety Attitudes Questionnaire (SAQ), German language version in Swiss university hospitals: A validation

study. *BMC Health Services Research*, 13, 347.

<http://dx.doi.org/10.1186/1472-6963-13-347>

Zwart, D. L., Langelaan, M., van de Vooren, R. C., Kuyvenhoven, M. M., Kalkman, C. J., Verheij, T. J., & Wagner, C. (2011). Patient safety culture measurement in general practice. Clinimetric properties of 'SCOPE'. *BMC Family Practice*, 12(1), 117. <http://dx.doi.org/10.1186/1471-2296-12-117>

Every reasonable effort has been made to acknowledge the owners of copyright material. I would be pleased to hear from any copyright owner who has been omitted or incorrectly acknowledged.

Appendix A: Literature Search Findings

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Sexton, Thomas, and Helmreich (2000) Germany, Israel, Italy, Switzerland, United States	To explore attitudes of intensive care unit (ICU) and operate room (OR) staff toward errors, stress and teamwork and to compare these attitudes to those of airline cockpit crew	395 health care workers (HCWs), including OR and ICU physicians, nurses and others 30,000 cockpit crew members, including captains and first and second officers	Cockpit Management Attitudes Questionnaire Flight Management Attitudes Questionnaire Operating Room Management Attitudes Questionnaire (ORMAQ) Intensive Care Unit Management Attitudes Questionnaire (ICUMAQ)	Medical staff members were less likely than cockpit crew members to acknowledge the influence of stress and fatigue on their performance Teamwork and communication differed significantly between groups of participants Steep hierarchies were most supportive among surgeons Surgeons perceived teamwork and communication within the team as better compared to how the rest of the team members perceived them ICU nurses perceived teamwork with physicians as less than what physicians perceived about teamwork with nurses
Gershon et al. (2000) United States	To develop an effective instrument to assess hospital safety climate in relation to commitment to risk management programmes of blood-borne pathogens, explore the relationship between hospital safety climate and (1) compliance of employees with safe work practices and (2) incidents of workplace exposure to body fluids, including blood and other body fluids	789 HCWs	Hospital Safety Climate Scale	Safety climate in relation to blood-borne pathogens can be investigated using a 20-question scale measure with six dimensions Three of these dimensions (senior management support for safety programmes, absence of workplace barriers to safe work practices and cleanliness and orderliness of the work site) were significantly associated with compliance Two dimensions (senior management support and frequent safety-related feedback/training) were significantly associated with workplace exposure incidents

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Itoh, Abe, & Andersen (2002) Japan	To assess attitudes and perceptions of medical staff about the reporting of adverse events	595 HCWs (including physicians, nurses and pharmacists) working at five hospitals	Hospital Safety Culture Questionnaire (HSCQ)	Physicians were significantly more willing to report an adverse event in severe cases and expressed slightly more willingness to inform patients in severe cases Nurses' willingness to report an adverse event rarely changes across all cases Recognition of power distance and human error are associated with the actual rate of incident reporting
Pronovost et al. (2003) United States	To assess staff attitudes toward safety at Johns Hopkins Hospital	395 HCWs (including physicians, nurses and others)	Safety Climate Scale Strategies for Leadership Survey (SLS)	Staff perceived that commitment of supervisors toward safety was greater than that of senior leaders Perceptions of safety among nurses was higher than among physicians
Kaissi, Johnson, and Kirschbaum (2003) United States	To measure teamwork and attitudes toward patient safety in OR, emergency department (ED) and ICU across four hospitals	271 nurses	Teamwork and Patient Safety Attitudes Questionnaire (TPSAQ)	Nurses had positive attitudes toward teamwork Most nurses perceived teamwork as important for patient safety
Singer et al. (2003) United States	To investigate patient safety attitudes and the ways in which those attitudes differ by hospital, job class and clinical status	2,989 HCWs (including physicians, nurses, senior executives and others) from 15 hospitals	Stanford University and Patient Safety Centre of Inquiry (Stanford/PSCI survey)	Senior managers, in particular non-clinicians and non managers, had discrepant attitudes and experiences Front line workers provided more problematic responses than senior managers However, in relation to management status, clinicians, particularly nurses, provided more problematic responses than non-clinicians
Flin, Fletcher,	To explore the attitudes of	222 anaesthetists from 11	Modified version of the	Anaesthetists demonstrated positive attitudes

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
McGeorge, Sutherland, and Patey (2003) Scotland	anaesthetists toward teamwork and safety	hospitals	ORMAQ	toward teamwork; however, some did not acknowledge the influence of stress and fatigue on their performance
Schmidt and Bottoni (2003) United States	To investigate barriers to medication errors and potential near miss reporting	58 ED staff (including physicians, nurses and others)	A four-item self-reporting questionnaire	Half of the participants stated they would not report errors or near misses, as they would be worried about administrative consequences The results support previous studies that highlighted fear of punishment and loss of job or credibility as barriers to reporting
Smetzer et al. (2003) United States	To assess hospital medication practices, highlight the characteristics of safe medication systems and establish baseline data to identify national priorities	1,435 hospitals	Medication Safety Self Assessment	Domains related to drug storage and distribution, environmental factors, infusion pumps, medication labelling, packaging and nomenclature issues received the highest scores across these hospitals. Conversely, those related to accessible patient information, communication of medication orders, patient education and quality processes such as double-check systems and organisational culture received the lowest scores
Thomas, Sexton, and Helmreich (2003) United States	To explore and compare teamwork attitudes of critical care physicians and nurses	90 physicians and 230 nurses working in ICUs	ICUMAQ	Physicians and nurses had discrepant attitudes about the quality of collaboration and communication they experienced with each other
Stratton, Blegen, Pepper, and Vaughn (2004)	To estimate nurses perceptions of the proportion of medication errors that are actually reported by them and why errors in	57 paediatric nurses and 227 adult nurses from 33 acute care units in 11 hospitals	Self-reporting questionnaire	The proportion of medication errors in paediatric was higher than in adult units The focus in nursing administration was on the

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
United States	medication occur and are not reported			person rather than the system Fear of the adverse consequences of reporting medication errors was the primary reason for not reporting
Grogan et al. (2004) United States	To assess reactions to and attitudes of HCWs about Crew Resource Management (CRM) training	463 HCWs (including physicians, nurses and others) trained in an eight month course completed the end-of course critique; 338 HCWs completed both pre- and post-training surveys	End-of-Course Critique CRM Human Factors Attitudes Survey	Participants' attitudes to the effectiveness of the course were very favourable Significant shifts were found in participants' attitudes for 20 of 23 attitudinal indicators CRM training had a very positive effect on participants' attitudes toward leadership roles, coordination and communication in building and maintaining effective teams
Mayo and Duncan (2004) United States	To describe nurse perceptions of medication errors	983 nurses from southern California acute care hospitals	Modified Gladstone's survey	Less than half of the nurses believed that all medication errors were reported Fear of consequences and the reaction of peers were highlighted as reasons for not reporting medication errors
Weingart, Farbstein, Davis, and Phillips (2004) United States	To characterise the culture of safety at four hospitals in Massachusetts; to determine whether this culture varies across and within hospitals and across professional groups; to identify factors associated with workers' overall assessments of patient safety	455 HCWs (including physicians, nurses and others) working at four Massachusetts hospitals	Culture of Safety Survey	Participants regarded the safety of patients as an essential part of their job Nurses and pharmacists were more likely than physicians to agree that workload hindered their ability to keep patients safe and to complete incident reports Physicians were more likely than nurses and pharmacists to inform patients and their families of errors Participants' overall assessment of the safety of patients was correlated with their perceptions of

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				workplace safety and leadership commitment to safety of patients
Coyle, Mercer, Murphy-Cullen, Schneider, and Hynan (2005) United States	To evaluate the effectiveness of an educational programme designed to improve attitudes and behaviours toward reporting medical events in ambulatory settings	30 family practice residents training at the University of Texas, South-Western Medical Centre, Dallas Family Medicine Residency Programme	Medical Event Reporting Attitude and Behaviour Questionnaire Barriers to Medical Event Reporting Survey	Programme attendance was significantly correlated with attitude and behaviour changes to medical event reporting Lack of time, extra paper work and concern about career and personal reputation were the major barriers in not reporting medical events
France et al. (2005) United States	To evaluate reactions to and attitudes of clinicians about CRM following participation in an eight-hour training programme	182 HCWs (including physicians, nurses and others) who received five sessions of CRM training at Vanderbilt University Medical Centre	End-of-Course Critique CRM Human Factor Attitude Survey	Clinicians reacted positively to CRM training and agreed that CRM could improve patient safety Participants' attitudes about the effectiveness of the CRM course were positive Significant shifts were found in participants' attitudes to 20 of 23 attitudinal indicators
McDonald, Waring, Harrison, Walshe, and Boaden (2005) United Kingdom	To investigate physicians' and nurses' attitudes to guidelines in surgical teams	41 surgical team members (including consultant surgeons, consultant anaesthetists and nurses) working in the operating department of a large teaching hospital in northern England	Observation and semi-structured interviews	Physicians and nurses had discrepant views about the contribution of guidelines to safety and clinical practice Physicians were likely to reject written rules and comply with unwritten rules about what constitutes acceptable behaviour in the medical profession Nurses disapproved of physicians' non-compliance with guidelines and perceived compliance with guideline to be synonymous with professionalism
Thomas, Sexton,	To evaluate the effectiveness of	1,119 HCWs (excepting	Safety Climate Survey (SCS)	EWRs had a positive impact on the attitudes of

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Neilands, Frankel, and Helmreich (2005) United States	executive walk-rounds (EWRs) on HCWs' attitudes toward safety climate at Memorial Hermann Hospital (MHH)	physicians) from 23 units at MHH; 547 nurses completed pre-EWR and 598 nurses a post-EWR survey	Pre-EWRs survey Post-EWRs survey	nurses who participated in the EWR sessions
Colla, Bracken, Kinney, and Week (2005) United States	To compare the general characteristics, dimensions covered and psychometric proprieties of surveys used in patient safety climate studies		Literature review	Nine instruments were identified that measured patient safety climate and utilised Likert scales to assess the attitudes of individuals The quality of psychometric testing varied across these surveys Nearly all surveys covered five patient safety dimensions: leadership, policies and procedures, staffing, communication and reporting
Hutchinson et al. (2006) United Kingdom	To explore the factor structure and reliability of the Teamwork and Safety Climate Survey (TSCS) and its potential usefulness in UK health care	1,307 HCWs (including physicians, nurses and others) from four acute hospitals and nine primary care trusts in UK	TSCS	A 22-item version of the questionnaire was produced that covered five factors (i.e., two teamwork factors and three safety climate factors) Internal consistency reliabilities were satisfactory to good. The Cronbach's alpha for all factors was 0.69 or higher This 22-item version was useable as a research instrument in primary and secondary care
Potylycki et al. (2006) United States	To identify fundamental practices and attitudes in relation to the occurrence of medication errors and reporting practices	Nursing staff from Lehigh Valley Hospital and Health Network, Pennsylvania; 644 nursing staff participated in 2002 and 665 in 2004	Staff Attitudes on Medication Error Reporting Survey	It is likely that errors of medication with more serious consequences will be reported than those with less serious outcomes

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Sexton, Helmreich, et al. (2006) United States, United Kingdom, New Zealand	To report the psychometric properties of and establish benchmarking data for and how the Safety Attitudes Questionnaire (SAQ) can be used	10,843 HCWs (including physicians, nurses and others) from 203 clinical areas	SAQ-ICU	The SAQ demonstrated good psychometric properties and can be used to assess HCWs' attitudes toward six patient safety domains: teamwork climate, safety climate, perceptions of management, job satisfaction, working conditions and stress recognition HCWs' attitudes varied both within and across organisations
Flin, Yule, McKenzie, Paterson-Brown, and Maran (2006) Scotland	To measure the attitudes of surgical team members to safety and teamwork in ORs	352 surgical team members (including 138 consultant surgeon, 93 trainee surgeons and 121 theatre nurses) working at 17 hospitals in Scotland	ORMAQ	Consultants' attitudes toward leadership and teamwork differed to those of nurses and trainee surgeons While OR staff members had positive attitudes to safety, they did not value the influence of stressors (such as stress and fatigue) on technical performance
Carayon, Hundt, Alvarado, Springman, & Ayoub (2006) United States	To explore the viewpoints of HCWs in relation to the safety of patients in outpatient surgery settings	79 HCWs (including physicians, nurses and anaesthesiologists) from five outpatient surgery centres in Wisconsin completed an open-ended questionnaire and 282 HCWs (including physicians, nurses and anaesthesiologists) completed a closed question questionnaire	Open-ended questionnaire Closed question questionnaire	HCWs perceived that a high quality of care was delivered by their surgery centres and provided by themselves Discrepant perceptions existed between physicians and other staff members, including nurses Nurses and other staff members were more likely to be report problems of patient safety than physicians
Makary, Sexton, Freischlag,	To use a validated tool to measure teamwork in surgical	2,135 OR staff (including surgeons, nurses and	SAQ-Operating room (SAQ-OR)	Discrepancies existed in OR staff attitudes toward teamwork

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Holzmueller, et al. (2006) United States	settings and compare attitudes to teamwork within and between OR staff	others) working at 60 hospitals		Physicians rated teamwork with other staff members as good; however, nurses perceived teamwork with other staff members as average
Sexton, Makary, et al. (2006) United States	To test the psychometric properties of a teamwork climate scale in an OR setting; to provide benchmark data on the OR teamwork climate by types of caregiver and hospital; to explore variances in OR teamwork perceptions by hospital and types of caregiver	OR staff in 60 US hospitals	SAQ-OR	The validity of the teamwork climate scale was assessed using a multilevel confirmative factor analysis The internal consistency of the six items in the scale was acceptable (Cronbach's alpha = 0.79) Teamwork climate differed significantly by hospital and types of OR caregiver
Grant, Donaldson, and Larsen (2006) United States	To evaluate the culture of safety by exploring HCWs' perceptions in relation to teamwork and communication, the perceived influences of stress and fatigue on performance, levels of satisfaction with job experiences, perceived support by management and current error reporting attitudes	229 inpatient and 41 OR staff	SAQ	The perceptions of physicians about teamwork were higher than those of all other staff members Recognition of the influence of stress and fatigue on performance was low across all groups Satisfaction with job experiences was high across all groups Most participants did not feel that they were rewarded for reporting incidents
Sexton, Holzmueller, et al. (2006) United States	To test the psychometric properties of a teamwork climate survey in labour and delivery (L&D) units, investigate variances in teamwork perceptions and obtain new	3,382 HCWs (including physicians, nurses and others)	SAQ-Labour and Delivery (SAQ-L&D)	The factors structure of the teamwork climate scale was confirmed using multilevel confirmatory factor analyses The internal reliability of the scale was good (overall Cronbach's alpha = 0.78) Discrepant attitudes toward teamwork climate

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
	benchmarking data			were found across L&D staff and units
Makary, Sexton, Freischlag, Millman, et al. (2006) United States	To assess the reliability of a safety climate scale, evaluate group-level consensus or “climate” in a surgical setting, establish useful benchmarking data on safety culture from 60 United States hospitals and investigate variances in safety culture between hospitals and OR staff	2,135 HCWs (including physicians, nurses and others) working at 60 hospitals	SAQ-OR	Items of the SAQ-OR showed high face validity and internal consistency (Cronbach’s alpha = 0.76) Scores on the SAQ varied widely by hospital, but not by OR staff types The percentage of participants who perceived a good safety climate in each hospital was between 16.3% and 100%
Singla, Kitch, Weissman, and Campbell (2006) United States	To review available measurement instruments used to assess the culture of patient safety		Literature review	The review examined 13 instruments covering 23 individual patient safety dimensions grouped into five categories: management/supervision, risk, work pressure, competence, rules and miscellaneous Instruments varied in terms of their content, the dimensions covered, length, reliability and validity
Flin, Burns, Mearns, Yule, and Robertson (2006) United Kingdom	To review quantitative studies of safety climate in health care and investigate the psychometric properties of instruments designed to assess safety climate		Literature review	Twelve studies were reviewed The instruments used in these studies covered 73 safety climate dimensions grouped into 10 safety themes: management/supervisor, safety systems, risk perception, job demands, reporting/speaking up, safety attitudes/behaviours, communication/feedback, teamwork, personal resources (e.g., stress) and organisational factors Certain instruments did not report standard

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				<p>psychometric criteria and no instrument achieved full scale testing</p> <p>The instrument that met most of the specified psychometric measures was the Hospital Survey on Patient Safety Culture (HSOPSC)</p>
Bechtold et al. (2007) United States	To evaluate the effect of morbidity and mortality conferences on patient safety attitudes of fellows and residents	58 residents and fellows training at the Department of Internal Medicine, University of Missouri–Columbia	20-item questionnaire	The new morbidity and mortality conference on the safety of patients introduced a number of improvements in the quality of care without sacrificing participants' attitudes or their attendance
Throckmorton and Etchegaray (2007) United States	To investigate the willingness of nurses to report errors of different levels of severity and the factors influencing reporting	435 registered nurses in Texas	Self-reporting questionnaire	<p>Most nurses were likely to report errors of all levels of severity</p> <p>The primary position held and the number of years since first licenced influenced nurses' intent to report errors with minimal or no injury</p>
Hellings, Schrooten, Klazinga, and Vleugels (2007) Belgium	To assess patient safety culture	3,940 HCWs (including physicians, nurses and others) from five Belgian general hospitals	HSOPSC (Dutch version)	<p>Positive scores were found to be low to average across all five hospitals</p> <p>The following dimensions received the lowest scores: hospital management support for patient safety, non-punitive responses to error, hospital transfers and transitions, staffing and teamwork across hospital units</p> <p>Teamwork within hospital units received the highest score</p> <p>Important variations on patient safety dimensions were found across all five hospitals</p>
Westbrook et al.	To compare and measure HCWs' attitudes toward a Safety	53 physicians, 209 nurses and 59 allied health staff	Self-reporting questionnaire	Significant variances were found across professions; nurses had the most favourable

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
(2007) Australia	Improvement Programme (SIP)	members		attitudes and physicians the least favourable
Kim, An, Kim, and Yoon (2007) Korea	To explore the perceptions of nurses in relation to frequency of error reporting and the safety culture of their hospitals and identify relationships between work-related factors and nurses' perceptions	886 nurses working at eight Korean teaching hospitals	HSOPSC (Korean version)	<p>Safety culture and reporting errors were not being sufficiently emphasised in Korean teaching hospitals</p> <p>Front line nurses evaluated issues of patient safety culture as more problematic than older nurses and those in managerial positions</p> <p>Staff nurses and charge nurses evaluated the safety culture of their hospital or unit less positively than head nurses</p> <p>Many nurses were not comfortable communicating their concerns about issues relating to the safety of patients and reporting errors</p> <p>Working area and working hours per week influenced nurses' attitudes toward communication openness</p>
Singer et al. (2007) United States	To describe the development of an instrument designed to explore staff perceptions about safety culture and measure its psychometric properties (i.e., validity and reliability)	21,496 HCWs from 105 hospitals	Patient Safety Climate in Health Care Organisations (PSCHO)	<p>A 38-item valid and reliable survey was developed</p> <p>The following nine constructs were identified: three organisational factors, two unit factors, three individual factors and one additional factor</p> <p>Cronbach's alpha coefficients ranged from 0.50 to 0.89</p>
Nabhan and Ahmed-Tawfik	To assess HCWs' attitudes toward patient safety and identify	600 HCWs (including physicians, nurses and	Self-reporting questionnaire in two parts: the first part	In this study's settings, the concept of patient safety was not emphasised enough for there to

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
(2007) Egypt	how the concept of patient safety differs across maternal health centres and different types of health care providers	others) working in 35 primary health centres in three governorates	included the SCS; and second part addressed compliance with management guidelines for pre-eclampsia	be delivery of reliable health care Compared to nurses and managers, physicians had the lowest positive attitudes Compliance with guidelines differed between governorates
Modak, Sexton, Lux, Helmreich, and Thomas (2007) United States	To adapt the SAQ to the outpatient setting and compare patient safety attitudes across various types of HCWs	251 HCWs (including physicians, nurses and others) working at an outpatient practice	SAQ-Ambulatory (SAQ-A)	No discrepant attitudes toward teamwork climate, safety climate, job satisfaction and working conditions were found across providers Nurses had the most favourable attitudes toward stress recognition Physicians had the least favourable attitudes about perceptions of management compared to managers who had the most positive attitudes
Reader, Flin, Mearns, and Cuthbertson (2007) Scotland	To investigate ICU physicians and nurses' perceptions of interdisciplinary communication and determine if these perceptions are shared	184 HCWs (including physicians and nurses) from four Scottish ICUs	Modified version of the Interdisciplinary Collaboration Questionnaire	Nurses and physicians had discrepant perceptions of interdisciplinary communication Compared to physicians, nurses reported lower levels of communication openness between nurses and physicians
Huang et al. (2007) United States	To determine whether safety culture varied across the ICUs of a single hospital and compare differences in safety culture attitudes between physicians and nurses	318 HCWs (including physicians, nurses and others) working in four ICUs in a single tertiary care hospital	SAQ-ICU	ICU staff had discrepant attitudes toward six patient safety domains across all ICUs, particularly in relation to working conditions and job satisfaction Compared with physicians, nurses had the lowest positive scores in relation to working conditions and job satisfaction
Rhodes et al. (2008)	To explore clinicians' reactions to the alert "How to prevent	95 HCWs prior to the introduction of the alert	Telephone and face-to-face interviews	Significant changes were found in the self-reporting practices of surgeons

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
United Kingdom	wrong site surgery” 12–15 months after the alert was first introduced	and 94 HCWs some 12-15 months later (including consultant surgeons and senior nurses) from 11 NHS hospitals		Inconsistent compliance with the detailed recommendations on how marking should be carried out was found The alert was effective in promoting marking before surgery and raising awareness about patient safety issues in relation to correct site surgery
Smits, Christiaans-Dingelhoff, Wagner, van der Wal, and Groenewegen (2008) Netherlands	To assess the underlying dimensions of the HSOPSC and its psychometric properties in Dutch hospitals and compare these results with the original version used in United States hospitals	583 HCWs (including physicians, nurses and others) working at eight hospitals in the Netherlands	HSOPSC (Dutch version)	An explorative factor analysis yielded 11 factors model The Dutch translation version of the HSOPSC had acceptable reliability and good construct validity
Hicks, Bandiera, and Denny (2008) Canada	To compare emergency (EM) staff attitudes toward CRM training	84 EM staff members (including physicians and nurses) at two Canadian academic teaching hospitals	Short Answer Web Survey	Participants strongly agreed that the CRM core principles were important in resuscitation Physicians tended to rate communication as a barrier to teamwork less frequently than nurses
Singer, Falwell, Gaba, and Baker (2008) United States	To identify whether supervisors and front line staff perceive patient safety climate more negatively than senior managers	18,361 HCWs (including physicians and nurses) working in 92 United States hospitals	PSCHO	Front line staff perceived safety climate as more problematic than supervisors and senior managers Overall and across seven distinct domains of safety climate, senior managers were more likely to perceive a positive safety climate in their institutions than non-senior managers
Deilkas and Hofoss (2008)	To assess psychometric properties of the SAQ	1,306 HCWs (including physicians, nurses and	The SAQ-Generic (Norwegian version)	The internal psychometric properties of the SAQ (Norwegian translation) were satisfactory

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Norway	(Norwegian version)	others) from 47 clinical units at a single university hospital		
Badir and Herdman (2008) Turkey	To investigate critical care nurses' perceptions of patient safety standards	150 critical care nurses from different hospitals (private, public and university)	Self-reporting questionnaire	Private hospitals had more patient safety programmes and more frequent quality management Private hospitals were more likely than other hospitals to support the reporting of errors, have reporting systems in place and have a non-punitive culture
Hartmann et al. (2008) United States	To test differences in safety climate across Veterans Health Administration (VA) hospitals	4,547 staff members (including senior managers, physicians and others) working at 30 hospitals	PSCHO	Overall, safety climate across the VA hospitals were positive Discrepant attitudes toward safety were found across management levels, clinician status and workgroups Senior managers reported a higher level of safety climate than front line staff and supervisors Non-clinicians reported higher levels of safety climate than clinicians
Haller et al. (2008) Switzerland	To investigate the impact of a specifically designed (CRM) intervention aimed at improving teamwork and communication skills	239 HCWs (including midwives, nurses, physicians and technicians) working at L&D units	A 10 standardised questionnaire A 36-item questionnaire SAQ-L&D	The employment of a CRM training programme in a multidisciplinary obstetrical setting was well accepted and a significant improvement in inter-professional teamwork was identified following the implementation of the programme
Pronovost et al. (2008)	To describe the impact of an evidence based intervention on teamwork climate in ICUs	5,440 HCWs from 99 ICUs across the state of Michigan	Teamwork Climate Scale of SAQ	Responses to the teamwork climate scale of SAQ provided a valid measure of teamwork climate attitudes among ICU staff members

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
United States				Significant variations were found among ICUs The implementation of comprehensive unit-based safety programmes led to a significant improvement in teamwork climate
Matsubara, Hagihara, and Nobutomo (2008) Japan	To develop a Japanese scale to assess safety climate and to evaluate its psychometric properties	1,878 HCWs (including physicians, nurses and others) working in 132 workplaces at 9 hospitals	50-item Japanese Patient Safety Climate Scale	The scale showed acceptable psychometric properties (i.e., dimensionality, validity and reliability)
Kudo et al. (2008) Japan	To examine safety climate dimensions among Japanese nurses	221 nurses working at a public hospital	25-item Japanese Safety Climate Scale	The following five factors were extracted by a factor analysis of the 25 items for the safety climate scale: intellectual development in relation to medical safety among nurses, accumulated fatigue, nursing conditions, superior attitudes and communication with physicians
Bognár et al. (2008) United States	To assess the perceptions and attitudes of surgical teams in relation to committing errors, the impact of errors and safety culture	61 HCWs (including surgeons, nurses and others) working in paediatric cardiac surgery teams at three health centres	58-item questionnaire including 30 questions adapted from the SAQ-OR	Work environment influenced participants' attitudes toward safety Many participants had difficulty raising safety issues and felt unable to express their disagreement Several issues were highlighted as concerns, including levels of staffing, equipment, production pressures and schedules Participants admitted that policies and guidelines were frequently ignored and errors occurred repeatedly
Elder, Brungs, Nagy, Kudel, and	To investigate the perceptions of ICU nursing staff about patient	125 staff nurses and nurse	Focus groups, safety	Dangers in the physical environment and medication administration were related to the

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Render (2008) United States	safety following their participation in a safety project designed to decrease hospital-acquired infections	managers	checklists, SCS and HSOPSC	safety of patients A self initiated task “double checking” was highlighted as the main safety task The experience of ICU nurses who participated in the project did not generalise to other aspects of patient safety or relate it to the interest of management in patient safety
Hindle, Haraga, Radu, and Yazbeck (2008) Romania	To determine HCWs’ views about patient safety in Romanian hospitals, compare these views to other countries and determine if differences existed in the perceptions of professional categories in relation to their own work and that of the clinical team	100 HCWs from 12 hospitals	Questionnaire on Patient Safety at Your Hospital	HCWs viewed the safety of patients as a major issue of concern that needed improvement Romanian HCWs showed as much interest in and willingness to improve patient safety as did HCWs in other countries Discrepant views about patient safety were noted between HCWs’ categories Compared with physicians, nurses were more aware of the need for patient safety improvement
Hofoss and Deilkas (2008) Norway	To establish a roadmap for patient safety research		Qualitative interpretation of the referenced literature	There are three ways to undertake patient safety research, including specific investigation of adverse events cases, deliver system reviews and the study of organisational culture of health care organisations.
Relihan, Glynn, Daly, Silke, and Ryder (2009) Ireland	To investigate the culture of safety in an acute medical admissions unit (AMAU) at a teaching hospital	55 HCWs (including physicians, nurses and others) working in an AMAU	30 core items of the SAQ	Significant differences were found in nurse manager scores and the overall mean for the study group on teamwork climate and safety climate Nurse managers scored the highest and health care assistants, the lowest

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				Compared to other staff members, health care assistants had significantly lower scores for working conditions and perceptions of management
Sax et al. (2009) United States	To quantify impacts of CRM training on patient safety-related behaviours and personal empowerment	857 HCWs (including physicians, nurses and others)	Pre-operative checklist, number and types of entry on incident reporting system and a 10-item survey	CRM training programmes influence personal behaviours and empowerment; however, it may take time for the impact of these programmes to become embedded in the culture
Parry, Horowitz, and Goldmann (2009) United States	To explore trainee physicians' attitudes toward patient safety	209 trainee physicians working at a paediatric teaching hospital	SAQ-Inpatient version, Trainee Survey	The attitudes of trainee physicians were most positive in areas associated with caring independently (i.e., job satisfaction, safety climate, working conditions, perceptions of management) and less positive in areas associated with caring interdependently (i.e., teamwork climate and stress recognition)
Bodur and Filiz (2009) Turkey	To assess the patient safety culture in primary health care units	180 HCWs (including general practitioners (GPs), nurses and others)	HSOPSC (Turkish version)	Health centre administrators should prioritise the improvement of patient safety culture HCWs should be encouraged to report errors without fear of punitive consequences No variations were found in the perceptions of patient safety across professions Teamwork within units and overall perceptions of safety received the highest percentage of positive scores; frequency of reporting and non-punitive responses to error received the lowest scores Error reporting was infrequent across GPs and nurses (GPs=87%, Nurses= 91%)

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Pringle, Weber, Rice, Kirisci, and Sirio (2009) United States	To examine safety climate within a cohort of regional hospitals	2,838 HCWs (including physicians, nurses and others) working at different hospitals	Modified version of the Veterans Health Administration hospital survey	Significant differences existed in the perception of patient safety climate across hospitals, participants and departments
Tai, Mok, Ching, Seto, and Pittet (2009) Hong Kong	To explore the perceptions of physicians and nurses on the importance and impact of health care-associated infections (HCAIs) and hand hygiene	102 physicians and 906 nurses working at four hospitals	Self-reporting questionnaire	More nurses than physicians acknowledged that over 75% of HCAIs could be prevented by hand hygiene practices Perceived behavioural controls and subjective norms were the most important factors associated with self-reported hand hygiene performance among physicians and nurses
Smits, Wagner, Spreeuwenberg, van der Wal, and Groenewegen (2009) Netherlands	To test the claim that the HSOPSC evaluates patient safety culture rather than individual attitudes	1,889 HCWs (including physicians, nurses and others) from 87 units of 19 hospitals	HSOPSC (Dutch version)	The results confirmed that the HSOPSC evaluates group culture and not just individual attitudes
Shaw et al. (2009) United States	To describe the characteristics of emergency department (ED) related to patient safety, assess associations between safety climate and these characteristics and measure the perceptions of staff members on safety climate	1,747 HCWs (including nurses, physicians and others) from 21 EDs	A self-reporting survey that assesses the structures and process of the ED SCS	Large inconsistencies existed among ED staff members on the structures and processes thought to be related to patient safety; such inconsistencies influenced the perceptions of ED staff members on safety climate The perceptions of nurses and physicians were influenced by their work experiences Physicians perceived safety climate more positively than nurses Several characteristics were identified as being associated with an improved safety climate,

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				including a lack overcrowding in EDs, a sick call back-up plan for physicians and the presence of an ED safety committee
Kaafarani et al. (2009) United States	To assess the hypothesis that patient safety climate was more positive in the OR and post-anaesthesia care unit (PACU)	4,504 HCWs from 30 VA hospitals	PSCHO	Overall, patient safety climate was similar between the OR/PACU and other work areas
Erasmus et al. (2009) Netherlands	To study potential determinants of compliance with hand hygiene among HCWs in a hospital setting	65 HCWs (including physicians, nurses and medical students) working in ICUs and surgical departments at five Dutch hospitals	Nine focus groups and seven individual interviews	Nurses and medical students perceived hand hygiene in the prevention of cross-infection among patients and themselves as important; however, physicians perceived hand hygiene as being important for self-protection, but felt that evidence about the effectiveness of hand washing in preventing cross-infection was insufficient
Singer et al. (2009) United States	To understand the perceptions of HCWs on safety climate and the ways in which safety climate differs across hospitals and by discipline and area of work	18,361 HCWs (including senior managers, physicians and others) from 92 United States hospitals	PSCHO	Differences existed in HCWs' attitudes and perceptions by discipline and area of work ED staff members, particularly nurses, perceived safety climate as lower than staff members in other areas Physicians were more positive than nurses in relation to their units' support and perception of safety efforts They also reported slightly more fear of shame than nurses
Al-Ahmadi (2009) Saudi Arabia	To explore HCWs' perceptions about patient safety and error reporting in Riyadh hospitals and detect factors influencing the	1,224 HCWs (including physicians, nurses and others) working at different hospitals (public	HSOPSC	A numbers of area were identified as needing improvement, including staffing, handoffs and transitions, communication openness and non-punitive response to error

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
	frequency of events reported	and private)		The frequency of event reporting was influenced by a number of factors, including staff position, the types of hospital, feedback and communication about errors, non-punitive responses to error, teamwork across units, the expectations and actions of supervisor/managers to promote patient safety
Speroff et al. (2010) United States	To determine if a group culture within health care organisations demonstrates a better alignment with patient safety climate	1,406 HCWs (including physicians, nurses and ancillary and allied staff members) working at 40 hospitals	Competing Values Measure of Organisational Culture SAQ SCS Information and Analysis (IA)	Compared to physicians, nurses had lower responses on the SAQ and SCS; however, there were no variations between physicians, nurses on the IA scale Variations in organisational culture and the types of culture relating to safety climate existed across hospitals
Baker, Amodeo, Krokos, Slonim, and Herrera (2010) United States	To develop and validate the TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ)	495 HCWs (including nurse and physicians) from various health care organisations	TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ)	The T-TAQ was a useful, reliable and valid tool for measuring individual attitudes toward the role of teamwork in the provision of health care Overall, nurses had a significantly higher scale mean than physicians and dentists Nurses also reported a more positive view of leadership than physicians
Kaya, Barsbay, and Karabulut (2010) Turkey	To test the psychometric properties of SAQ in Turkish hospitals, investigate differences in safety attitudes and provide baseline data	1,349 HCWs (including nurses and physicians)	SAQ (Turkish version)	The internal psychometric proprieties of the SAQ (Turkish version) were satisfied Safety attitudes varied widely across hospitals
Haugen et al. (2010)	To test the psychometric properties of a Norwegian	575 operating theatre staff (including surgeons,	HSOPSC (Norwegian version)	Differences existed in perceptions on patient safety climate with anaesthesia staff members

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Norway	translation of the HSOPSC and compare safety climate factors from a surgical setting to hospitals in Unites States, the Netherlands and Norway	anaesthetists, OR nurses, nurse anaesthetists and ancillary staff members)		reporting the highest mean responses Compared to HCWs in the US, OR staff perceived their hospital's patient safety climate far more negatively, but in a similar way to those of HCWs in the Netherlands The psychometric properties of the Norwegian version of the HSOPSC requires further study before it can be considered as reliable tool in operating theatre environments
Lee et al. (2010) Taiwan	To verify the validity and reliability of a safety culture survey instrument in Chinese and evaluate hospital safety culture in Taiwan	45,242 HCWs (including physicians, nurses and others) from 200 hospitals, 20 medical centres, 57 regional hospitals and 123 district hospitals in Taiwan	SAQ (Chinese version)	The study confirmed psychometric properties of the SAQ-C in Taiwanese hospitals Most hospitals did not have a fully developed safety culture and there was substantial room for safety culture improvement
Holden, Watts, and Walker (2010) United States	To identify if differences in communication known to effect the safety of patients in acute care settings also effect the safety of patients in ambulatory care	107 HCWs (including physicians, nurses and others) from four Air Force clinics	SAQ-A	The scores of collaboration and communication among physicians and nurses who work in an ambulatory care setting appear to be higher than those who work in an acute care setting The findings did not support the findings of earlier studies that showed discrepant attitudes between nurses and physicians toward collaboration and communication
Carney, West, Neily, Mills, and Bagian (2010) United States	To confirm reported variations in teamwork between surgeons and perioperative nurses and assess the implications of these variations for improving practice	690 HCWs (including surgeons and perioperative nurses) from 34 hospitals	SAQ-OR	The study confirmed a previous study that found that surgeons have more favourable attitudes to teamwork than nurses Surgeons rated teamwork with themselves and with nurses as high. Conversely, nurses rated

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
	patterns in the OR			teamwork higher with other nurses than with surgeons
Jansma et al. (2010) Netherlands	To study the impact of a two-day patient safety course on speciality registrars' attitudes, intentions and behaviours to the voluntary reporting of incidents	33 registrars	Self-reporting questionnaire, including a modified version of the Coyle et al. (2005) questionnaire	Significant changes were observed in attitudes to reporting incidents and intentions immediately following the course and during follow up No significant changes were observed in behaviours relating incident reporting
Petrova, Baldacchino, and Camilleri (2010) Malta	To determine the perceptions of Maltese nurses in relation to medication errors, including factors that may contribute to these errors, barriers to reporting and potential preventive measures	38 medical wards nurses working at a general hospital	Modified version of Wakefield et al. (1996) and Osborne et al.'s (1999) questionnaires	The following factors were identified as possible contributors to medication errors: illegible handwriting of physicians, tiredness of nurses, interruption or distraction during drugs administration Fear of blame and systems of administration were identified as the major barriers in reporting errors Several preventive strategies were recommended, including introducing hospital policies, the establishment of structured protocols on the administration of drugs, increasing staff, avoiding distraction and introducing regular education sessions in numeracy and pharmacology
Fukuda, Imanaka, Hirose, and Hayashida (2010) Japan	To assess how the number of incident reports were related to system-level activities and reporting design	418 hospitals participated in the study	Self-reporting questionnaire	A significant association was found between educational activities and physicians' reporting of incidents Physicians and nurses submitted more reports when the time required to complete the reports

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				was short Improving staff education and decreasing the burden of reporting would improve incident reporting
Carney, Mills, Bagian, and Weeks (2010) United States	To evaluate sex differences in OR caregiver attitudes toward patient safety	187 HCWs (including physicians, nurses and anaesthesia providers) working in OR	SAQ-OR	The study confirmed the findings of previous studies that reported a discrepancy among OR staff attitudes toward patient safety Sex differences in OR staff attitudes toward patient safety were identified; females were significantly more likely to have less favourable attitudes about working conditions and job satisfaction
Patterson, Huang, Fairbanks, and Wang (2010) United States	To assess the feasibility of utilising the SAQ in the emergency medical service (EMS) setting, test the psychometrics properties of the SAQ and assess variations in scores across different EMS agencies	77 HCWs from three EMS agencies in Pittsburgh, Pennsylvania	SAQ-Emergency medical service version (EMS-SAQ)	The results confirmed the feasibility of utilising the SAQ in an EMS setting with a high response rate, acceptable internal consistency and model fit validity Variation existed in safety culture scores between participants and across EMS agencies
Bodur and Filiz (2010) Turkey	To identify the validity and reliability of the translated form of HSOPSC, assess perceptions of physicians and nurses on patient safety and compare results with US hospital settings	309 HCWs (including nurses and physicians) working at Turkish public hospitals	HSOPSC (Turkish version)	The Turkish version of HSOPSC was a valid and reliable instrument for evaluating the culture of patient safety The highest scores were reported for “teamwork within hospital units” whereas the lowest scores were reported for “frequency of events reported” Overall, the scores of patient safety dimensions

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				were lower than benchmarking data
France et al. (2010) United States	To evaluate the safety climate in ICUs owned by a large for-profit integrated health delivery system, determine specific provider, ICU and hospital factors influencing safety climate and improve the reporting of safety climate data for comparison and benchmarking	1,502 HCWs (including physicians, nurses and others) from 41 hospitals	SAQ-ICU	The cohort was characterised by a positive safety climate Working conditions and perceptions of management were rated significantly lower than other safety climate domains The scores of safety climate domains were significantly correlated with the participants job type
Gaal, Verstappen, and Wensing (2010) Netherlands	To examine the views of GPs on patient safety	68 GPs	Web-based self-reporting survey	GPs' views on risk and safety in primary care did not completely match those reported in policy documents and published papers GPs considered a broader range of factors than those reported in previous studies on patient safety in primary care, including a poor doctor-patient relationship Other risk factors such as insufficient maintenance of the GP's medical knowledge, patients aged over 75 years and language barriers were also considered risk factors to the safety of patients in primary care
Nilsson, Lindberget, Gupta, and Vegfors (2010) Sweden	To assess OR staff attitudes toward "time-out", one year after its implementation and assess attitudes toward another part of the WHO checklist "sign-out"	331 OR staff (including physicians and nurses)	Self-reporting questionnaire	The attitudes of OR staff toward checking patient positioning, allergies and reviewing potential critical moments were positive, but differed significantly between professions. The attitudes of OR staff toward a similar checklist used at the end of surgeries were also positive

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Gore et al. (2010) United States	To measure OR staff attitudes toward patient safety after the implementation of an expanded perioperative briefing	363 HCWs (including physicians, nurses and others) working in the OR	Self-reporting questionnaire developed by the Agency for Health Research and Quality	CRM initiatives were found to improve perceptions of patient safety. The improvement largely demonstrated by nursing staff
O'Leary, Wayne, et al. (2010) United States	To evaluate the impact of structured interdisciplinary rounds on HCWs' ratings of teamwork and collaboration	159 HCWs (including nurses and resident physicians) at a teaching hospital in Chicago	Self-reporting survey adopted from (Makary, Sexton, Freischlag, Holzmueller, et al., 2006) and (Thomas et al., 2003) Teamwork climate and safety climate scales from SAQ	Resident physicians rated the quality of communication and collaboration with nurses similarly across each unit Compared to the control unit, a high proportion of nurses in the intervention unit perceived the quality of collaboration with resident physicians as high Participants in the intervention unit rated the teamwork climate significantly higher than those in the control unit. This discrepancy can be explained by the higher ratings of teamwork climate reported by nurses in the intervention unit
Kalisch and Lee (2010) United States	To determine whether the level of nursing teamwork influences the extent and nature of missed nursing care	2,216 nursing staff working in 50 units at four hospitals	Nursing Teamwork Survey MISSCARE Survey	11% of missed nursing care was related to teamwork Nursing teamwork level influences the nature and the extent of missed nursing care
Alahmadi (2010) Saudi Arabia	To assess the extent to which the culture of Saudi hospitals supports patient safety	1,224 HCWs (including physicians, nurses and others) at 13 hospitals (public and private) in Riyadh	HSOPSC	Organisational learning-continuous improvement, feedback and communication about errors, teamwork within units were identified as areas of strength for most hospitals Staffing, teamwork across units, under reporting of events and non-punitive responses to errors were identified as potential areas for

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				improvement in most hospitals
Huang et al. (2010) United States	To investigate if the culture of safety in ICUs is independently associated with outcomes	2,103 HCWs (physicians, nurses and others) working at 30 ICUs	SAQ-ICU	Safety climate and perceptions of management were moderately associated with outcomes
O'Leary, Ritter et al. (2010) United States	To measure ratings of teamwork by HCWs on inpatient medical units and barriers to collaboration	159 HCWs (including physicians, nurses and others) at a single academic hospital	Self-reporting questionnaire	<p>Compared to nurses, most physicians rated the quality of collaboration with nurses as high or very high</p> <p>Nurses perceived that difficulty identifying patients' providers and their roles were the biggest barriers to interdisciplinary communication; however, not having nurses and physicians on the same paging system was perceived as the biggest barrier by primary hospital physicians</p>
Robb and Seddon (2010)	To identify valid and reliable patient safety culture survey tools		Literature review	The recommended tools for undertaking a patient safety culture survey are SAQ and HSOPSC. Both of which have been widely used and have sound and comprehensive psychometrics properties
Jackson, Sarac, and Flin (2010) United Kingdom	To examine recent studies using staff surveys of hospital safety climate focusing on measurement issues		Literature review	Currently, four questionnaires (i.e., the HSOPSC, a safety attitudes questionnaire, a patient safety climate in health care organisations survey and a hospital safety climate scale) have been found to have acceptable psychometric properties. These questionnaires have been used worldwide and across a variety clinical settings to evaluate HCWs' attitudes and perceptions about safety

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Kemper, de Bruijne, van Dyck, and Wagner (2011) Netherlands	To determine the effectiveness and cost effectiveness of CRM training on attitude, behaviours and organisation after one year	ICU HCWs	The End-of-Course Critique The Safe Team questionnaire The Process Control Questionnaire The COMPaz Questionnaire (translated Dutch version of the HSOPSC) The Error Culture Questionnaire The job satisfaction dimension of the Occupational Stress Inventory	CRM improved the use of non-technical skills of HCWs and provided opportunities to improve the quality of care and decrease errors in ICUs In addition to the general effectiveness and cost effectiveness of CRM training, assessments on barriers and facilitators will provide insight into the implementation process of CRM
Zwart et al. (2011) Netherlands	To study the internal consistency and construct validity of the SCOPE questionnaire in general practice	294 HCWs working at Dutch general practices	The SCOPE questionnaire (derived from the Dutch version of the HSOPSC)	The SCOPE questionnaire is an appropriate survey that can be used to evaluate the culture of patient safety in general practice; however, future studies are needed to confirm the construct and factor structure of the questionnaire
Poley, van der Starre, van den Bos, van Dijk, and Tibboel (2011) Netherlands	To evaluate the safety climate in a paediatric surgical ICU, compare the findings with benchmarking data and determine potential deficiencies	63 physicians and nurses in May 2006 and 73 nurses and 14 physicians in May 2007	SAQ (Dutch version)	The findings were mixed in relation to the discrepancies between nurses and physicians on three patient safety domains (i.e., teamwork climate, safety climate and stress recognition) Physicians had higher scores than nurses at both points in time; however, nurses had higher scores than physicians in the two other domains (i.e., perception management and working conditions) Compared to benchmarking data, most domains

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				were good; however, there was still room for improvement
Parand et al. (2011) United Kingdom	To compare perceptions of senior managers and clinical frontline staff on the importance of the Safer Patients Initiative (SPI)	635 surveys at 20 trusts participating in SPI	Self-reporting questionnaire	Statistically significant differences were identified in perceptions of senior managers and clinical front line staff on the importance of the SPI
Thompson et al. (2011) United States	To compare the perceptions of nursing staff in relation to safety climate in clinical units characterised by high and low ratings of leader-member exchange (LMX) and examine the characteristics that might explain any variations	711 nursing staff and unit directors working at 34 inpatient units at a single academic medical centre	LMX Tool HSOPSC	Significant differences were found between high and low LMX scoring units across the following dimensions: supervisor safety expectations, organisational learning-continuous improvement, total communication, feedback and communication about errors and non-punitive response to errors
Raftopoulos, Savva, and Papadopoulou (2011) Cyprus	To assess the teamwork climate and culture of safety in public maternity units	140 midwives working in the public sector	SAQ-L&D (Greek version)	Discrepancies in attitudes were found between experienced and less experienced midwives across the following domains: teamwork climate, safety climate, job satisfaction. Experienced midwives rated these domains more highly than less experienced midwives Midwives with longer tenure in their current units also rated the following domains higher than those with less experiences: safety climate, job satisfaction and working conditions
Sorokin, Riggio, Moleski, and Sullivan (2011) United States	To assess whether trainees' patient safety attitudes have evolved over time	In 2008, 621 postgraduate residents and 256 medical students and in 2003, 549 residents and 236 medical students at Thomas	Self-reporting questionnaire	The safety attitudes of trainee physicians at one institution improved between 2003 and 2008

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
		Jefferson University Hospital		
Ali, Osborne, Bethune, and Pullyblank (2011) United Kingdom	To evaluate the introduction of pre-operative safety briefings on start times in ORs and assess the attitudes of OR staff toward these briefings	37 HCWs (including physicians, nurse and others) working in ORs	Staff Satisfaction Questionnaire for Team Briefing Sessions	Briefings on safety were popular among OR staff and did not delay OR start time OR staff showed positive attitudes toward the safety briefings and strongly agreed about factors influenced communication and safety of patient
Allard, Bleakley, Hobbs, and Coombes (2011) United Kingdom	To examine whether exposure to pre-surgery briefings is related to the safety climate perception	597 HCWs working in theatre rooms	SAQ-OR	A strong relationship was found between briefing practices and safety attitudes Practitioners who approved the statement that “briefings are common in the operating theatre” also reported a better safety climate in operating theatres
Sexton et al. (2011) United States	To assess the influence of a comprehensive unit-based safety programme on safety climate in a large cohort of ICUs	127 HCWs (including physicians, nurses and others) working in 71 ICUs	SAQ-ICU	Significant improvements in overall mean safety climate scores were found following the implementation of a patient safety programme designed to improve teamwork and culture in ICUs
Pettker et al. (2011) United States	To identify the impact of an obstetrics patient safety programme on the staff safety culture	192 labour and birth unit HCWs in 2004, 198 in 2006, 189 in 2007 and 183 in 2009	SAQ-L&D	Following the programme, significant improvements were found in the percentage of staff members with positive attitudes toward teamwork climate, safety climate, job satisfaction and management Safety programmes can improve HCWs’ perceptions of HCWs on safety
di Martino et al.	To evaluate the longer-term sustainability of the before and	420 pre-intervention and 463 immediately post-	Direct observation	The overall impacts of the intervention were sustained over a one-year period, a marked

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
(2011) Italy	after hand hygiene intervention	intervention observations, 456 clinician–patient interactions		variation was observed between physicians and nurses
Hull, Arora, Kassab, Kneebone, and Sevdalis (2011) United Kingdom	To assess teamwork and levels of stress experienced by team members in OR	20 general surgical teams each consisting of six members (surgeon, surgical assistant, anaesthesiologist, anaesthetic, scrub nurse and circulating nurse)	Observational Teamwork Assessment for Surgery tool State-Trait Anxiety Inventory questionnaire	Overall, teamwork was above the scale midpoint and levels of stress were low Variations were found between team members; pre-operatively, circulating staff were most likely to be stressed; however, intra-operatively and post-operatively, surgical assistants were most likely to be stressed
Vaismoradi, Salsali, Esmaeilpour, and Cheraghi (2011) Iran	To explore the perspectives and experiences of Iranian nurses in relation to communications between physicians and nurses	22 nurses working in two teaching hospitals	Semi-structured interviews	The following three main themes emerged to explain the context and dynamics of communication between physicians and nurses: no independence in decision-making, lack of acknowledgment of nurses' capabilities and unequal support by the health care system
Arfanis, Shillito, and Smith (2011) United Kingdom	To discuss HCWs' views on their everyday working life, working relationships and patient safety	48 HCWs (including physicians, nurse and others)	Semi-structured interviews	The majority of HCWs understood risk as being intrinsic to health care The terms acceptable versus unacceptable and avoidable versus unavoidable were used to describe the risks in HCWs daily working lives The training and experience of HCWs influenced the decision-making processes used
Bagnasco et al. (2011) Italy	To understand HCWs' level of awareness about patient safety culture	724 HCWs (physicians, nurses and others) from a hospital in Northern Italy	HSOPSC (Italian version)	Of the 12 perspectives tested, six had a high level of significance The HSOPSC (Italian version) can be used to raise awareness of HCWs about safety culture

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Hansen, Williams, and Singer (2011) United States	To identify the link between hospital patient safety climate and rates of rehospitalisation within 30 days of discharge	14,010 HCWs (including physicians, nurses and others) from 67 hospitals in the United States	PSCHO	A significant positive correlation was found between higher rates of re-admission for acute myocardial infraction and heart failure
Hoffmann et al. (2011) Germany	To test psychometric properties of a newly developed safety climate questionnaire for use in general practice	332 HCWs from 60 practices	Frankfurt Patient Safety Climate Questionnaire for General Practice (FraSiK)	The instrument's nine factors represented the following dimensions relating to safety culture in general practice: teamwork climate, error management, perception of causes of errors, safety of clinical processes, job satisfaction, safety of office structure, perceptiveness to health care assistants and patients, quality and safety of medical care and staff perceptions of management The internal consistency of the scales ranged from moderate to good
Zakari (2011) Saudi Arabia	To investigate attitudes of nurses toward the culture of patient safety in academic ambulatory health care settings	221 ambulatory care staff nurses and nurse managers	SAQ-A	Job satisfaction received the highest positive attitudes and working conditions received the second highest positive attitudes. While, teamwork climate and safety climate received the lowest positive attitudes among nurses
Abdou and Saber (2011) Egypt	To evaluate the culture of patient safety among nurses	165 nurses working in 12 inpatients units at Student University Hospital	SAQ-ICU	Job satisfaction and teamwork climate received the highest responses among nurses. Conversely, perceptions of management received the lowest ratings A significant association was found between the socio-demographic characteristics of participants and their responses to all safety culture dimensions
Ballangrud, Hedelin, and Hall-	To examine the perceptions of registered nurses about patient	220 RNs from 10 ICUs at	HSOPSC (Norwegian	Significant differences in the nurses' perceptions of patient safety were identified

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Lord (2012) Norway	safety climate in ICUs and investigate potential predictors for overall safety perceptions and the frequency of incident reporting	six hospitals	version)	across units and hospitals The most positive responses to patient safety climate were at unit level Incident reporting, feedback and communication about errors and organisational learning for continuous improvement needed improvement
Farhan, Brown, Vincent, and Woloshynowych (2012) United Kingdom	To study the effect of a new tool for shift handover; that is, “The ABC of Handover”, in EDs and its effect on shift handover	41 handovers before the tool was implemented 12-week observation period of 42 handovers (post-implementation)	Observation and self-reported survey	The implementation of the tool was successful and led to changes that resulted in a significant increase in the operational issues related to handover Participants agreed that “The ABC of Handover” improved handover and was easy to learn
Davis, Sevdalis, and Vincent (2012) United Kingdom	To explore the attitudes of physicians and nurses toward involving patients in safety-related behaviours	40 physicians and 40 nurses from wards at a teaching hospital	Attitudes Toward Supporting Patient Involvement Survey Attitudes Toward Participation as a Patient	Overall both physicians and nurses had positive attitudes toward patients’ involvement; however, nurses were more willing to support patient involvement than physicians
Delgado Hurtado et al. (2012) Republic of Guatemala	To assess acceptance and attitudes toward the WHO Surgical Safety Checklist among surgical staff	147 surgical staff (including physicians, nurses and others) at Guatemala hospitals	Self-reporting questionnaire SAQ-OR (Spanish version)	More nurses than other surgical staff members knew that the checklist had to be used before the induction of anaesthesia, skin incisions and the patient leaving the OR Most staff members agreed that the use of the WHO checklist was beneficial and it was a good decision to implement it There was a high level of acceptance of the checklist among surgical staff; however, a lack of knowledge about when the checklist should be used still existed

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Friese and Manojlovich (2012) United States	To assess the perceptions of nurses about relationships between physicians and nurses in ambulatory oncology settings	345 nurses	The Practice Environment Scale of the Nursing Work Index (PES–NWI)	Nurses perceived their relationships with physicians as generally good Physicians behaviours and structure factors emerged as two themes used by nurses to describe their relationship with physicians
Chiang, Lin, Hsiao, and Chang (2012) Taiwan	To explore how cultures of incident reporting and willingness to report incidents impacted behavioural involvement in patient safety (BIPS)	1,049 nurses at 9 hospitals	Self-reporting questionnaire including the Safety Organising Scale, the Incident Reporting Culture Questionnaire and other reporting willingness questions	The following factors contributed positively to BIPS: a culture of incident reporting, a willingness to report incidents, tenure of employment and rates of reporting
Bleakley, Allard, and Hobbs (2012) United Kingdom	To investigate whether implementing a complex education intervention to improve teamwork climate would result in an incremental, longitudinal improvement in teamwork attitudes and values	18 surgical team staff members pre-intervention and 159 surgical team staff members post-intervention	SAQ-OR	Following the implementation of serious structured educational interventions, teamwork climate attitudes improved incrementally and were sustained
Siemsen et al. (2012) Denmark	To explore HCWs' attitudes and experiences with critical episodes in patient handover, to determine the factors influencing handover within and between hospitals and from ambulances to hospitals	47 HCWs (including physicians and nurses and others) at a large university hospital	Semi-structured single-person interviews	In some handover situations, work was done in silos The following eight factors were identified as influencing patient safety in handover situations: information, communication, professionalism, responsibility, team awareness, culture, infrastructure and organisation
Gallego, Westbrook, Dunn,	To compare patient safety cultures of different services	14,054 HCWs (including physicians, nurses and	SAQ-ICU	Variations in staff attitudes were found at a macro-level across all types of health services

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
and Braithwaite (2012) Australia	across a health system and determine whether variations can be accounted for by profession, organisational roles, ages and the types of care provided	others) working in the South Australian public health system		Demographic variations in staff attitudes toward safety were also found; clinical staff, senior managers, aged care workers and older staff had more positive attitudes
Aboul-Fotouh, Ismail, Ez Elarab, and Wassif (2012) Egypt	To evaluate the perceptions of HCWs toward the culture of patient safety within an organisation and identify factors that play a role in the culture of patient safety	510 HCWs (including physicians, nurses and others) from a teaching hospital in Cairo	HSOPSC (Arabic version)	Of the 12 patient safety dimensions, organisational learning for continuous improvement had the highest score followed by teamwork within hospital units Non-punitive responses to errors received the lowest score Significant variations were found between physicians, nurses and paramedical staff in relation to feedback and communications about errors Significant differences were also found between physicians and paramedical staff in relation to hospital management support for patient safety
Uddin, Marsteller, Sexton, Will, and Fox (2012) United States	To compare the attitudes of obstetrical staff toward clinical protocols and the Johns Hopkins Oxytocin Protocol (JHOP)	115 HCWs (including registered nurses, certified nurse midwives and residency and fellowship trainees) from L&D units at Johns Hopkins and the Johns Hopkins Bayview Medical Centre	Johns Hopkins Oxytocin Administration Protocol Survey	The use of the clinical protocol was well received by obstetrical staff Significant differences existed in the attitudes of staff members toward the use of JHOP
Etchegaray, Gallagher, Bell, Dunlap, and Thomas (2012)	To design and assess survey items that evaluate the error disclosure culture, investigate relationships between error	496 HCWs (including nurses and physicians and others) from six health institutions	A newly developed questionnaire that included items on teamwork and safety climate dimensions from the	Two factors were found to evaluate error disclosure culture. The first focused on the error disclosure general culture and the second on the error disclosure trust culture

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
United States	disclosure culture, safety culture and teamwork culture and determine predictive validity of survey items		SAQ	These two factors were unique from safety culture and teamwork culture The new validated tool can be used to predicts intent to disclose error better than any other measures presently being used to evaluate health care cultures
Arora et al. (2012) United kingdom	To explore the effect of a safety skills training programme on surgical residents' knowledge, attitudes and awareness of patient safety	27 surgeons at 19 London hospitals	Multiple Choice Questions (MCQs) to assess safety knowledge Modified version of same questionnaire to assess safety attitudes	A significant improvement in safety knowledge was found following the programme. Improvements also occurred in error analysis, improving safety, and self-reported ability to influence safety There was a significant enhancement in participants' awareness and recognition of patient safety in the workplace
Zhu et al. (2012) China	To develop a new instrument to measure patient safety culture in Chinese hospitals by evaluating existing questionnaires and establishing new items and domains suitable to Chinese hospitals	24 HCWs (including physicians, nurses and others) at 11 hospitals	Focus group	Participants identified eight new items and three additional dimensions, absent from existing tools The new items and dimensions addressed staff training, mentoring of new employees, compliance with rules and procedures, equipment availability and leadership walk-rounds The final survey consisted of a 66-items across 14 domains
Krill, Staffileno, and Raven (2012) United States	To assess the attitudes of staff members and barriers in safe patient handling	304 HCWs (including registered nurses and patient care technicians) from Northwestern Lake	Health Care Lifting Task Force (Employee Questionnaire) Safe Patient Handling Risk	More equipment and education were needed A lack of a "no fit" policy, adequate lifting equipment and adequate space on patient care unit were identified as major barriers to safe

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
		Forest Hospital, Illinois	Assessment	patient handling
Garon (2012) United States	To investigate the perceptions of nurses on their ability to speak up and be heard in the workplace	33 registered nurses in staff or management positions from different health care settings in California	Focus groups	Findings were categorised into three groups: influences on speaking up, transmission and reception of a message and outcomes or results The decision of nurses to speak up was influenced by two types of influence: personal influences (i.e., cultural background, values, how they were raised, language and education) and organisational influences (i.e., peer influences, manager and administrative influences and environment or culture)
Hartnell, MacKinnon, Sketris, and Fleming (2012) Canada	To enhance the understanding of barriers to medication error reporting in health care organisations	Physicians, pharmacists and nurses	Focus groups In-depth interviews	Incentives for reporting errors in medication were categorised into three groups: patient protection, provider protection and professional compliance Barriers to error reporting in medication were categorised into five groups: reporter burden, professional identity, information gap, organisational factors and fear
Devriendt et al. (2012) Belgium	To test the psychometric properties (face and content validity and internal consistency) of the SAQ (Dutch version)	144 HCWs (including physicians, nurses and others) from three geriatric, three surgical and three medical wards	SAQ-Dutch version	The SAQ (Dutch version) demonstrated acceptable to good psychometric properties
Profit et al. (2012b) United States	To identify whether the safety culture dimensions measured by the SAQ provides consistent results when used as an NICU	547 HCWs (including physicians, nurses and others) from 12 NICUs in a faith-based non-profit	SAQ-ICU	Safety culture permeates many aspects of patient care and organisational functioning. The SAQ is a useful tool for comparing the performance assessments of NICUs

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
	performance measure	health system		
Profit et al. (2012a) United States	To describe NICU staff assessments of safety culture, explore variations within and between NICUs across safety culture domains and identify associations with staff characteristics	NICU staff (including physicians, nurses and others) from 12 NICUs at a faith-based non-profit health organisation	SAQ-ICU	Perceptions of management and stress recognition received the least positive responses Physicians scores were higher than the scores of nurses and other staff members Variation existed in safety culture domains across NICUs NICU variation was similar to variation in adult ICUs, but with higher scores in NICU
Böhmer et al. (2012) Germany	To explore the quality of inter-professional cooperation and perioperative safety standards before and after the introduction of a safety checklist from the perspective of staff members	71 HCWs from the Department of Anaesthesiology and the Department of Traumatology	Self-reporting questionnaire	Factors relevant to safety in perioperative settings could be controlled significantly better and with more understanding by introducing a safety checklist (as proposed by WHO)
Listyowardojo, Nap, and Johnson (2012) Netherlands	To compare perceptions and attitudes on institutional practices that can effect patient safety between all professional groups	2,995 HCWs (including physicians, nurses and others) at a large university medical centre	Self-reporting questionnaire	Differences among professional groups existed in relation to ratings for the organisational and safety culture dimension The organisational and safety culture dimension rated more positively by physicians and non-medical staff than did other participants (i.e., nurses, clinical staff and laboratory staff)
McCaffrey et al. (2012) United States	To identify the impact of an educational programme and to follow-up meetings on the attitudes of nurses and medical resident toward positive communication and collaboration	68 nurses and 47 medical residents at a hospital in South Florida	Jefferson Scale of Attitudes toward Physicians–Nurse Collaboration and Communication Collaboration and Critical Thinking for Quality Patient	Following a formal educational programme and follow-up meetings, the attitudes of nurses and medical residents improved Continuing education can contribute to the development of positive communication styles

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
			Outcomes Survey	and collaboration skills
de Wet, Johnson, Mash, McConnachie, and Bowie (2012) United Kingdom	To measure safety climate perceptions in primary care and examine whether perceptions varied significantly between practice teams	563 team members from 49 practices	Self-reporting questionnaire	Significant differences in safety climate perceptions were found at the practice team level according to participants' years of experience, whether the practice was community or practice based, professional roles and training status Managers and GPs perceived the safety climate more positively than other participants
Weaver, Wang, Fairbanks, and Patterson (2012) United States	To define the relationship between EMS safety culture and safety outcomes for patients or providers	EMS workers from 27 agencies	EMS-SAQ	Perceptions of individual EMS staff members toward safety culture were associated with composite measures for patients and provider safety outcomes Participants reporting injuries scored lower on safety climate, teamwork climate, perceptions of management, working conditions and job satisfaction Participants reporting an error or adverse event scored lower on safety climate, teamwork climate, perceptions of management and working conditions
Flotta, Rizza, Bianco, Pileggi, and Pavia (2012) Italy	To explore the knowledge of physicians on evidence based patient safety practices, their attitudes on preventing and managing medical errors and investigate their behaviours when	696 physicians at 40 hospitals	Self-reporting questionnaire	Physicians had inconsistent knowledge of evidence based safety practices Physicians reported positive attitudes toward patient safety; however, less than half of the physicians questioned agreed with the disclosure of errors to patients

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
	facing medical errors			Most Physicians reported that they had never been involved in a medical error The most highly rated reasons for medical errors were “overwork, stress or fatigue of health professionals”
Boan, Nadzam, and Clapp (2012) United States	To show that the differences in perceptions between the four organisational roles of executive, manager, staff members and physicians is a useful strategy for improving quality and safety	4,184 HCWs (including staff, managers, physicians and executives) at five US hospitals	HSOPSC	Lower differences in the perceptions of safety across these four professional groups were associated with higher ratings of safety culture
Martowiriono, Jansma, Van Luijk, Wagner, and Bijnen (2012) Netherlands	To investigate the barriers to incident reporting by residents and how these barriers can be overcome	22 residents	Three focus groups	Not all incidents were reported by residents because they experienced a non-stimulating culture and had a perceived lack of ability to report Several solutions were suggested, including providing the possibility to report anonymously, providing feedback, creating a culture of incident reporting, simplifying the procedure and clarifying what and how to report
Patterson, Geis, LeMaster, and Wears (2013) United States	To improve patient safety in a paediatric ED by implementing a multidisciplinary, simulation-based curriculum emphasising teamwork and communication	289 HCWs (including physicians, nurses and others) at the initial training; 151 at the reevaluation session	The Patient Safety Knowledge Assessments Tool SAQ-Teamwork and Safety Climate Modified version of Behavioural Markers for Neonatal Resuscitation Scale	Simulation training was an effective tool to modify safety attitudes and teamwork behaviours in an ED Repeated practice opportunities are needed to sustain cultural and behavioural changes
Verbakel, Zwart,	To modify and validate an	921 HCWs working in	SCOPE-PC (modified version	The SCOPE-PC questionnaire demonstrated

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Langelaan, Verheij, and Wagner (2013) Netherlands	existing questionnaire into a useable generic questionnaire for all Dutch primary care professions	primary care	of SCOPE questionnaire)	sound psychometric properties that would enable all professions in Dutch primary care to gain insight into their safety culture
Zimmermann et al. (2013) Switzerland	To assess the psychometric properties of the German language version of SAQ	319 physicians and nurses in medical and surgical wards at two university hospitals	SAQ (German version)	The German language version of SAQ showed acceptable to good psychometric properties in measuring patient safety climate in Swiss hospital wards
Martijn et al. (2013) Netherlands	To explore whether the perceptions of HCWs about patient safety in their practices are associated with the number of safety incidents identified in patient records	HCWs at 70 practices	A retrospective audit of 50 patient records Self-reporting questionnaire	The following factors were identified as threats to patient safety: communication breakdowns inside and outside the practice and reporting of patient safety concerns The perception of communication problems outside the practice was significantly associated with a higher number of safety incidents
Schwappach, Frank, and Davis (2013) Switzerland	To investigate how HCWs evaluate patient behaviours and assess their responses to the involvement of patients in these behaviours (in relation to the HCWs, patients and potential errors)	11,41 HCWs (including physicians, nurses and others) at 12 hospitals	Self-reporting questionnaire	Patient' behaviours and correct identification influenced the approval of patient safety-related interventions Predicted impacts on the patient–HCW relationship were less positive and hardly associated with the approval of patients' behaviours The predicted impact on the patient–HCW relationship was mainly determined by the professionals' responses to patients HCWs reported positive attitudes toward patients intervening in relation to medication errors more than toward hand hygiene

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes procedures
Tenna et al. (2013) Ethiopia	To evaluate HCWs' knowledge, attitudes and practices in relation to hand hygiene and tuberculosis (TB) infection control measures	261 HCWs (including physicians, nurses and others) at two university hospitals	76-item self-reporting questionnaire	Participants believed that if they performed hand hygiene procedures they would be less likely to transmit infections to their patients Significantly more physicians than nurses forget to perform hand hygiene Most HCWs had excellent knowledge about TB infection control and felt that proper TB infection control could prevent nosocomial transmission
Hamdan (2013) Palestine	To measure safety culture, examine variations among NICUs and assess their associations with caregiver characteristics	211 nurses and physicians at 16 NICUs	SAQ-ICU (Arabic version)	There were large variations in safety culture within and between a comprehensive sample of Palestinian NICUs While nurses rated safety culture slightly higher than physicians, the difference was not statistically significant
Hedsköld et al. (2013) Sweden	To describe the Swedish version of the HSOPSC and assesses its psychometric properties	84,215 HCWs (including physicians, nurses and others)	HSOPSC (Swedish version)	The HSOPSC (Swedish version) demonstrated acceptable construct validity and internal consistency for use in hospitals and primary care centres
Nie et al. (2013) China	To assess the patient safety attitudes and perceptions of HCWs and compare the properties of HSOPSC in Chinese and United States hospitals	1,160 HCWs (including physicians, nurses and others) at 32 hospitals	HSOPSC (Chinese version)	HCWs had a positive attitude toward the patient safety culture in their organisations There were significant differences in perceptions of patient safety culture across different work units, positions and qualification levels There were significant variations between physicians and nurses in relation to: teamwork

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				<p>within units, organisation learning-continuous improvement, management support for patient safety, feedback and communications about errors, overall perceptions of patient safety, communication openness, non-punitive responses to errors and staffing</p> <p>Compared with United States hospitals, more positive responses were reported in Chinese hospitals across the following five dimensions: teamwork within units, organisation learning-continuous improvement, communication openness, non-punitive responses to errors and teamwork across units</p>
Kalisch, Xie, and Ronis (2013) United States	To assess the effect of a “train-the-trainer” intervention on satisfaction levels with teamwork in nursing and the amount of missed nursing care	242 nurses at three hospitals	Nursing Teamwork Survey MISSCARE Survey Questions about teamwork satisfaction and teamwork knowledge	<p>Following the intervention, teamwork increased and missed care decreased</p> <p>There were high levels of satisfaction among nurses in relation to teamwork</p> <p>The “train-the-trainer” intervention was effective and efficient in increasing nursing teamwork and decreasing missed nursing care</p>
Aboshaiqah and Baker (2013) Saudi Arabia	To identify the factors that nurses perceive as contributing to the culture of patient safety in hospital	498 registered nurses at a tertiary care hospital in Riyadh city	HSOPSC	<p>Most participants perceived a positive patient safety culture in their hospital</p> <p>There were significant variations in nurses’ perceptions based on their gender, age, years of experience, spoken language (Arabic versus non-Arabic) and the length of their shifts</p>
Almutairi, Gardner, and McCarthy	To explore the perceptions of a multicultural nursing workforce on safety climate and investigate	319 nurses working at King Abdul-Aziz Medical	Interviews Document analysis	Nurses’ perceived clinical safety in this multicultural environment as unsafe

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
(2013) Saudi Arabia	the influence of workforce diversity on clinical safety	City in the Riyadh region	SCS	No significant associations were found between perceptions of the safety climate and age groups or years of nursing experience Significant associations were found between nurses' perceptions of safety and their national backgrounds The diversity culture of nursing staff could have a significant influence on their perceptions of the clinical safety climate
Taylor and Pandian (2013) United States	To investigate construct validity issues in previous analyses by authors using the Stress Recognition subscale of SAQ correlation matrices	Data from previous study	SAQ	The stress recognition domain did not fit into the overall construct of safety climate that SAQ was intended to measure
Abrahamson, Ramanujam, and Anderson (2013) United States	To explore the relationship between perceptions of nurses about safety climate and staffing structure	430 registered nurses working at two midwestern hospitals	SCS	There were significant variations in perceptions of safety climate across hospital units Retaining experienced nurses may reduce errors, as they may act as a resource promoting a positive safety climate
Hoffmann et al. (2013) Germany	To analyse the effect of a professional group, the professional experience of practice staff and practice characteristics on safety climate perceptions	2,145 HCWs including 1,480 health care assistants, 599 physicians and 32 other staff member at 618 practices in Germany	FraSiK	HCWs' use of incident reporting and a systematic approach to errors were rare More positive perceptions were reported by physicians than health care assistants in four of seven factors addressed to both groups Physicians and male participants were the most willingness groups to admit they had made errors

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Fujita et al. (2013) Japan and Taiwan	To explore the characteristics of the patient safety culture in Japan, Taiwan and the United States	HCWs (including physicians, nurses and others) 6,963 participants in Japan, 10,019 in Taiwan and 291,341 in the United States	HSOPSC (Japanese version)	In general, United States HCWs were more likely to perceive their patient safety culture more positively than workers in Japan or Taiwan The lowest rated dimensions were continuous improvement in Japan and event reporting of near misses in Taiwan Staffing in the United States was rated as being high Cultural differences should be considered in the development of effective intervention designs to improve the patient safety culture
Jones, Podila, and Powers (2013) United States	To identify if teamwork training improves perceptions of staff members in relation to the safety culture	47 nurses and medical assistants in an ED	HSOPSC	Training in teamwork skills can contribute to a positive improvement in staff perceptions of the safety culture in the ED
Rydenfält, Johansson, Odenrick, Åkerman, and Larsson (2013) Sweden	To examine the actual use of a checklist and catalogue deviations for the purpose of identifying improvements in operating theatre		24 surgical procedures were video-recorded	The WHO checklist was not always applied as planned; the components facilitating communication were often neglected It is not appear that the “time-out” was conducted as a team effort The risk concept and the perceptions of all team members about checklist items should be addressed to improve adherence with the checklist
Chaboyer et al. (2013)	To create a baseline understanding of the safety culture in Australian ICUs	672 HCWs (including nurses and physicians) working in ICUs	SAQ-ICU	The highest rating was for teamwork climate whereas the lowest ratings were for perceptions of management and working conditions

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Australia				<p>More physicians gave higher ratings in relation to job satisfaction, teamwork climate, safety climate and working conditions than nurses</p> <p>Creating a baseline understanding of the safety culture of an ICU allows leaders to apply targeted interventions aim to improve specific safety culture dimensions</p>
Böhmer et al. (2013) Germany	To evaluate perioperative safety standards and the quality of inter-professional cooperation from the perspective of involved staff for up to two years following the implementation of a safety checklist	99 HCWs (including 76 physicians and 23 anaesthetic nurses)	Self-reporting questionnaire	<p>Nurses and anaesthesiologists rated verification of written consent for surgery, clear marking of the surgical site and time management more positively over time</p> <p>Communication items were rated less positively at 18 and 24 months than at 3 months</p> <p>Orthopaedic surgeons rated being better informed about patients, planned operations and the assignment of tasks during surgery more positively</p> <p>The quality of inter-professional communication and cooperation did not show long term improvements</p>
Zimmermann et al. (2013) Switzerland and United States	To evaluate the inconsistency in safety culture dimensions within and between Swiss and United States clinical areas	1,370 HCWs (including nurses and physicians) from 54 hospital units	SAQ (German version)	<p>Inconsistency existed in the SAQ dimensions at unit, hospital and country levels</p> <p>Significant inconsistencies were found in four of the six SAQ dimensions; that is, teamwork climate, safety climate, job satisfaction and perception of management</p> <p>These inconsistencies were more likely to be at the unit level than the hospital level; at the hospital level, stress recognition and working</p>

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
				conditions were more likely to be varied
Raftopoulos and Pavlakis (2013) Cyprus	To explore the factors that influence safety attitudes and teamwork climate in ICUs	132 registered nurses working in Cyprus ICUs	A newly developed questionnaire that incorporated the SAQ-ICU (Greek version as a part)	Significant variations in the safety climate of the ICUs of regional hospitals were demonstrated Several variables were identified as effecting patient safety culture in an ICU, including age, infrastructure, the severity of the case and the nurse skill mix
Kvist et al. (2013) Finland	To explore the views of nurse managers and registered nurses on the patient safety culture in four acute care hospitals	109 nurse managers and 723 registered nurses	HSOPSC (Finnish version)	Both groups acknowledged patient safety issues and critically valued error-prevention mechanisms in the hospitals
Kvist et al. (2013) Finland	To examine perceptions of nurses and patients about the Magnet model components of transformational leadership and empirical quality outcomes in four Finnish hospitals	Patients: 2,566 Nursing staff: 1,151 re transformational leadership; 2,707 re job satisfaction; and 925 about patient safety culture	Transformational leadership scale Kuopio University Hospital Job Satisfaction Scale HSOPSC (Finnish version) The Revised Humane Caring Scale	Significant differences existed in patient safety culture between the four hospitals There were low scores in the awareness of the work of nursing leaders A high level of job satisfaction was reported by nurses Patients believed they generally received excellent care
Brborović, Šklebar, Brborović, Brumen, and Mustajbegović (2014) Croatia	To identify whether all 12 dimensions of the United States HSOPSC are applicable, valid and reliable to Croatian HCWs	561 HCWs (including nurses and physicians) at four Croatian hospitals	HSOPSC (Croatian version)	The Croatian translation of the HSOPSC was compatible for 11 of the original 12 dimensions of the United State HSOPSC For research purposes in Croatian hospitals, the following dimensions should be revised: staffing, communication openness and organisational learning-continuous improvement

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
Verbeek-Van Noord, Wagner, Van Dyck, Twisk, and De Bruijne (2014) Netherlands	To describe the patient safety culture of Dutch EDs, investigate associations between safety culture dimensions and patient safety grades as reported by ED staff members and compare these associations between nurses and physicians	480 nurses, 159 physicians and 91 other professionals at 33 non-academic EDs	HSOPSC–Dutch	Differences existed between nurses and physicians in relation to two safety culture dimensions (i.e., frequency of event reporting and hospital management support for patient safety) Physicians graded patient safety higher than nurses The following factors were associated with staff reported safety in the ED: teamwork across units, frequency of event reporting, communication openness, feedback about and learning from errors, hospital management support and overall perceptions of safety
Alayed, Lööf, and Johansson (2014) Saudi Arabia	To assess the attitudes of nurses toward safety culture	237 nurses working at six Saudi Arabian ICUs	SAQ-ICU	The SAQ-ICU can be used to identify areas for improvement according to the attitudes and perceptions of nurses The highest positive attitudes were reported toward job satisfaction and the lowest was toward perceptions of management Nurses rated the quality of their communications and collaboration with other nurses as higher than that with other ICU staff members
Je et al. (2014) South Korea	To evaluate the impact of a hospital-wide quality improvement programme on the management of sudden cardiac arrest by assessing health care providers' attitudes toward	489 pre- and 575 post-assessment staff (including physicians and nurses)	A newly developed SAQ that included the 30 core items plus five items related to management. Translated into Korean	The results revealed a significant improvement in all seven domains of the questionnaire Physicians and nurses showed improvement in five domains of the questionnaire Neither physicians nor nurses showed any

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
	patient safety			improvement in sharing information
Taher et al. (2014) Saudi Arabia	To evaluate the safety climate in dialysis units as perceived by physicians and nurses	509 HCWs (physicians and nurses) working in five dialysis units in three cities in Saudi Arabia	SCS	Nurses perceived the dominant safety climate higher than physicians Perceptions of a stronger commitment to safety was rated higher by clinical area leaders than by senior leaders in the organisation
Gauld and Horsburgh (2014) New Zealand	To assess perceptions of HCWs on quality and safety across an entire system of public hospitals	10,303 HCWs (physicians, nurses and others)	Self-reporting questionnaire	A positive commitment to quality and safety among New Zealand HCWs and their employers was found; however, variations existed in relation to their commitment according to district, profession, gender, age and scope for improvement
Vertino (2014) United States	To identify whether a customised TeamSTEPPS training initiative would result in improved attitudes toward teamwork among nursing staff in an inpatient hospital unit	26 nurses from inpatient unit at a VA hospital	T-TAQ	There was significant improvement on all five components of teamwork; that is, team structure, leadership, situation monitoring, mutual support and communication TeamSTEPPS training can be useful in promoting improved attitudes toward teamwork
Hoskote, Nadkarni, Annapureddy, Shetty, and Fried (2014) United States	To assess the perspectives of internal medicine residents in relation to the impact of work hour limitations on their ability to discharge patient care duties	158 residents in a residency programme	A 17-item online survey	There was an agreement among residents that the patients had adequate continuity of care Most residents agreed that they had enough time to follow up on consult notes and important investigations. The majority of residents perceived that the new work hour limitations would continue to uphold patient safety, but that handoffs in care had to be restricted

Authors/Country	Objective(s)	Participants	Instruments	Key findings in relation to patient safety attitudes
El-Jardali, Sheikh, Garcia, Jamal, and Abdo (2014) Saudi Arabia	To determine the association between predictors of patient safety culture and outcomes in light of the characteristics of participants and the size of the facility	2,572 HCWs (including physicians, nurses and others) working at a large hospital in Riyadh	HSOPSC	The following two dimensions were identified as areas of strength: organisational learning-continuous improvement and teamwork. However, the areas identified as requiring improvement were: non-punitive responses to errors, staffing and communication openness A regression analysis revealed associations between higher aggregate scores of patient safety and increased age (i.e., 46 years and older), longer years of experience, having a Baccalaureate degree (BA) and being a physician or other care providers

Note: The majority of information in this Table was extracted from the publications referred to in the Table.

Appendix B: Safety Climate Surveys

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
Intensive Care Unit Management Attitudes Questionnaire (ICUMAQ)	Total length of survey not given	ICU personnel	Stress Hierarchy Teamwork Error	None reported (Sexton et al., 2000)
Operating Room Management Attitudes Questionnaire (ORMAQ)	Total length of survey not given	OR personnel	Stress Hierarchy Teamwork Error	None reported (Sexton et al., 2000)
Hospital Safety Climate Scale	46	HCWs	Demonstrable management support for safety programme The absence of hindrance to safety work practices Availability of personal protective and engineering control equipment Minimal conflict and good communication among staff members Frequent safety related feedback/training by supervisor Cleanliness and orderliness of work site	Factor analysis yielded six separate factors Internal reliability testing was performed and Cronbach's α for the survey scales ranged from 0.71 for feedback and training to 0.84 for management support
Hospital Safety Culture Questionnaire (HSCQ)	99	HCWs	Power distance Communication Teamwork Recognition of own performance under high stress Stress management for team members	None reported (Itoh et al., 2002)

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			Morale and motivation Satisfaction with management Recognition of human error Awareness of own competence	
Teamwork and Patient Safety Attitudes Questionnaire (TPSAQ)	24	HCWs	Perceived effect of teamwork Support for team communication and decision-making Level of teamwork in my department/unit Leadership and assertiveness	Factor analysis was performed and yielded four factors Internal reliability testing was performed and the Cronbach's α for the survey scales was ranged from 0.62 to 0.87 (Kaissi et al., 2003)
Modified version of the Operating Room Management Attitude Questionnaire (M-ORMAQ)	60	OR personnel	Leadership structure Confidence assertion Information sharing Stress and fatigue Teamwork Work values Error Organisational climate	Internal reliability testing was performed for the proposed structure and Cronbach's α ranged from 0.18 to 0.54 (Flin et al., 2003)
Safety Climate Scale	10	HCWs	Organisational commitment to patient safety Knowledge of how to report adverse events Understanding of system as the cause of adverse events	The scale demonstrated good test-retest reliability, good internal consistency and replicable factor structures. No further details were given (Pronovost et al., 2003) In a previous study, Cronbach's α for internal consistency of SCS was 0.86 (Speroff et al., 2010)

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
Strategies for Leadership Survey (SLS)	Total length of survey not given	HCWs	Leadership Strategic planning Information and analysis Human resources Process management Patient and family involvement	No validity or reliability details given (Pronovost et al., 2003)
Stanford University and Patient Safety Centre of Inquiry (Stanford/PSCI survey)	82	HCWs	Reporting of mistakes Rewards and punishment for reporting Feelings of blame and shame Teamwork Risk perception Process auditing Production pressures Time and resources Mitigating decisions Fatigue and stress Quality of hospital operations Redundancy Rules and procedures within the hospital Employee training Culture	Principal factor analysis yielded five factors, which accounted for 80% of the systematic variation across questions: organisation, department, production, reporting/seeking help and shame/self-awareness (Singer et al., 2003)
Medication Safety Self Assessment	194	HCWs	Drug standardisation, storage and distribution Environmental factors	The survey was tested in a small subset of hospitals before being distributed to all hospitals in the United States

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			<ul style="list-style-type: none"> Medication delivery device use Drug labelling, packaging and nomenclature Drug information Staff competency and education Quality processes and risk management Patient education Communication of drug orders Patient information 	<p>Internal reliability testing was performed and Cronbach's α for 20 dimensions ranged from 0.44 to 0.84 (Smetzer et al., 2003)</p>
Culture of Safety Survey	34	HCWs	<ul style="list-style-type: none"> Leadership Salience Non-punitive environment Reporting Communication 	<p>The survey was pilot-tested with 3 groups of 5 to 10 persons each (N=21 medical house officers)</p> <p>Reliability was tested by readmission of the survey to 36 staff members after initial administration</p> <p>No further details given (Weingart et al., 2004)</p>
Hospital Survey of Patient Safety Culture (HSOPSC)	42	HCWs	<ul style="list-style-type: none"> Communication openness Feedback and communication about error Frequency of event reported Handovers and transitions Management support for patient safety Non-punitive response to error Organisational learning and continuous improvement Overall perceptions of safety Staffing 	<p>HSOPSC was piloted in 21 hospitals across the United States. The results were used to examine reliability and validity, as well as its factor structure, through exploratory and confirmatory factor analyses. A list of 14 dimensions was generated (12 safety culture dimensions and two overall patient safety outcomes)</p> <p>All dimensions were shown to have an acceptable level of reliability.</p>

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			Supervisor/manager expectations and actions promoting patient safety Teamwork across units Teamwork within units	Cronbach's α ranged from 0.63 (for staffing) to 0.84 (for frequency of event reporting) (Sorra & Nieva, 2004)
Jefferson Scale of Attitudes Toward Physician–Nurse Collaboration	15	Physicians and nurses	Communication and collaboration	Jefferson Scale was tested on 65 nurses and 48 physicians; Cronbach's α coefficients were 0.87 for nurses and 0.89 for physicians (McCaffrey et al., 2012)
Hospital Transfusion Service Safety Culture Survey (HTSSCS)	27	Transfusion Services Personnel	Leadership Policies and procedures Staffing Communication Reporting	Internal reliability testing was performed and Cronbach's α for the survey scales ranged from 0.61 to 0.85 (Colla et al., 2005)
Medical Event Reporting Attitude and Behaviour Questionnaire	5	Training residents	Medical event reporting	None reported (Coyle et al., 2005)
Barriers to Medical Event Reporting Survey	9	Training residents	Perceived barriers to medical event reporting	None reported (Coyle et al., 2005)
Collaboration and Critical Thinking for Quality Patient Outcomes Survey	13	Physicians and nurses	Share in decision making Cooperate in decisions Plan together Open communication	Internal consistency reliability for the multi-item scales ranged from 0.64 to 0.91, with a median reliability of 0.84 (McCaffrey et al., 2012)
Veterans Health Administration Patient Safety	112	HCWs	Management commitment	None reported (Singla et al., 2006)

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
Questionnaire (VHA PSCQ)			Overall perceptions Non-punitive responses Reporting Human factors Communication openness	
Allina Hospitals and Clinics	20	HCWs	Management/supervision Safety system Work pressure Communication openness Beliefs about causes of errors and adverse events	None reported (Singla et al., 2006)
Patient Safety Climate in Anaesthesia	54	Anaesthesia personnel	Management and institutional commitment to safety Non-punitive responses to error Willingness to ask for help Work pressure Adequacy of crisis management Feedback and communication	None reported (Singla et al., 2006)
Trainee Supplemental Survey	41	Residency trainees in academic hospitals	Communication openness Adequacy of training Supervision	None reported (Singla et al., 2006)
Safety Climate Survey (SCS)	21	HCWs	Management/supervision Safety system Procedures/rules Teamwork	Test-retest reliability of 0.85–0.90 and Cronbach’s α values of 0.75–0.88 (Singla et al., 2006)

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			Organisational learning Feedback and communication Beliefs about causes of errors and adverse events Overall perception of safety	
Teamwork and Safety Climate Survey (TSCS)	27	HCWs	Input into decisions and collaboration with other staff Information handover Attitudes to safety within own team Capacity to learn from errors Overall confidence in safety of organisation Perceptions of management’s attitudes to safety	Exploratory factor analysis yielded a two-factor solution for the teamwork domain and a three-factor solution for the safety climate domain Internal consistency reliabilities were satisfactory to good for all factors, with Cronbach’s α 0.69 or above (Hutchinson et al., 2006)
Safety Attitudes Questionnaire (SAQ)	60	HCWs	Teamwork climate Safety climate Job satisfaction Perceptions of management Working conditions Stress recognition	The fit of final six factor model of SAQ was generally satisfactory: $X(784)=10,311.27, P < .0001; CFI= .90, RMSEA=.03, SRMR$ (between clinical areas) $=.17$ and $SRMR$ (within clinical area) $=.04$ Raykov’s P coefficient (P value = 0.90) indicates strong composite scale reliability of SAQ (Sexton, Helmreich, et al., 2006)
Patient Safety Climate in Health care Organisations survey (PSCHO)	38	HCWs	Senior managers’ awareness and engagement with patient safety Organisational resources for safety Overall emphasis on safety Unit safety norms	Exploratory factor and Multitrait analysis results indicate that the constructs demonstrate substantial convergent and discriminant validity in the MTA. Cronbach’s α coefficients for internal consistency reliability of the survey

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			Unit recognition and support for safety efforts Provision of safe care Fear of blame and punishment Learning	scales ranged from 0.58 to 0.89 (Singer et al., 2007)
Staff Attitudes on Medication Error Reporting Survey	45	HCWs	Occurrence and reporting of medication errors Attitudes/beliefs toward medication error causes and reporting	None reported (Potylycki et al., 2006)
Modified version of the Interdisciplinary Collaboration Questionnaire	Not given	ICU personnel	Communication openness between nurses and physicians Communication openness within group Communication accuracy between nurses and physicians Communication accuracy within groups Shift communication between groups Shift communication within groups Unit communication timelines Satisfaction with nurse and physician communication Satisfaction with communication within groups Physicians leadership Nursing leadership Perceived unit effectiveness Understanding patient care goals	Internal reliability of the survey scales was performed. All but three scales showed acceptable reliability (Cronbach's α coefficients > 0.7) Two scales (accuracy between shifts and accuracy within shifts) showed reliability slightly below 0.6). The shift communication between groups scale had unacceptably low Cronbach's α coefficients ($\alpha=0.47$) (Reader et al., 2007)
Questionnaire on Patient Safety at Your Hospital	55	HCWs	Overview of patient safety Generating ideas Communication between junior and senior staff Communication between clinicians in different	None reported (Hindle et al., 2008)

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			professions Management of information systems Access to information Responsibility and accountability Continuous learning Teamwork Consumer involvement Effective work meetings Leadership	
Modified version of VHA hospital survey	45	HCWs	leadership Culture for information sharing Reporting system Effective teamwork Care delivery process Integrated health care teams Patient safety as a personal priority	Factor analyses and internal consistency test were performed by calculating Cronbach's α coefficients. The range of factor loading was high for each survey scale (Pringle et al., 2009)
Nursing Teamwork Survey	33	Nursing staff	Trust Team orientation Backup Shared mental models Team leadership	Exploratory factor analysis yielded five factors explaining 53.11% of the variance. Confirmatory factor analysis confirmed the factor structure (comparative fit index = 0.88, root mean square error of approximation = 0.06, standardized root mean square residual = 0.05). Test-retest reliability was .92. Reliability estimated using coefficient alpha was .94 and the alpha for the

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
				subscales ranged from .74 to .85 (Kalisch, Lee, & Salas, 2010)
TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ)	30	HCWs	Leadership Situation monitoring Mutual support Communication Team structure	Internal consistency coefficients of the survey subscales ranged from 0.70 (for team structure and mutual support) to 0.83 (for situation monitoring). Construct independence was examined by inter-correlating the four T-TAQ subscales. Coefficients ranged from 0.36 (mutual support and team structure) to 0.63 (situation monitoring and communication) (Baker et al., 2010)
Staff Satisfaction Questionnaire for the Team Briefing Sessions	10	OR personnel	Safety briefings	None reported (Ali et al., 2011)
Frankfurt Patient Safety Climate Questionnaire for General Practice (FraSiK)	72	GP personnel	Teamwork climate Error management Perception of causes of errors Safety of clinical processes Job satisfaction Safety of practice structure Receptiveness to health care assistants and patients Staff perception of management Quality and safety of medical care	Exploratory factor analysis with orthogonal varimax rotation was carried out and the internal consistency of the identified factors calculated. Nine factors emerged, reflecting a wide range of patient safety dimensions Internal consistency of these factors ranged from 0.552 (for safety of practice structure) to (0.905 (for teamwork climate) (Hoffmann et al., 2011)
Attitudes Toward Supporting Patient Involvement Survey	16	Physicians and nurses	Interactional behaviours: Engaging in dialogue with health care professional	Internal consistency of scales was performed Cronbach's α coefficients of interactional behaviours scales ranged

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
			Asking challenging question Notifying physicians/nurses of problem or errors in their care Non-interactional behaviours: Bringing medications into hospital and a list of allergies Choosing a hospital based on its safety record for a particular procedure Reporting an error to a national reporting system	from 0.71 to 0.84) (Davis et al., 2012)
The Johns Hopkins Oxytocin Administration Protocol Survey (JHOAPS)	36	L&D personnel	Compliance with clinical protocol	Content validity was established through review of the instrument by an expert panel and pilot testing (Uddin et al., 2012)
Modified version of Medical Students' Patient Safety Questionnaire (Year 1)	Not given	HCWs	Knowledge of error and patient safety Attitudes to analysis of errors and improving safety Ability to influence patient safety Personal beliefs about safety Intentions about safety Feelings about errors	None reported (Arora et al., 2012)
Hospital Safety Climate Scale	20	HCWs	Management support Absence of job hindrances Cleanliness and orderliness Minimal conflict and good communication among staff members Frequent safety-related feedback/training by supervisors Availability of personal protective equipment and	Factor analysis was performed and yielded six factors for the survey Internal consistency of scales was performed; Cronbach's α coefficients for the six subscales ranged from 0.71 for feedback and training to 0.84 for management support

Survey	No. of items	Targeted Sample	Safety climate factors	Psychometric properties
engineering controls				

Note: The majority of information in this Table was extracted from the publications referred to in the Table.

Appendix C: Ethics Approval, Curtin University



Memorandum

To	Ahmed Saad Alzahrani
From	Leslie Thompson
Subject	Protocol Approval – SPH – 09 - 2011
Date	May 2 nd , 2011
Copy	Dr Jan Lewis

School of Public Health

Telephone 9266 7819

Facsimile 9266 2958

Email: l.thompson@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "Clinicians' attitudes toward patient safety: A sequential explanatory mixed methods study in Saudi Armed Forces Hospitals (Eastern Region)". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period from April 29th, 2011 to April 29th, 2012.

The approval number for your project is SPH – 09 - 2011. *Please quote this number in any future correspondence.* If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Thank you

Mrs Leslie Thompson
Ethics Coordinator
School of Public Health
Curtin University

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number «Approval_Number»). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or hrec@curtin.edu.au

Appendix D: Medical Services Department permission to undertake research

الرقم : ١٤٣١٧ / ٢ / ٩
التاريخ : ١٤٣٤ / ٩ / ٢٢
المرفقات :



المملكة العربية السعودية
وزارة الدفاع والطيران والفتشية العامة
رئاسة هيئة الأركان العامة
الإدارة العامة للخدمات الطبية للقوات المسلحة
المساعد لشؤون التعليم والتدريب والأبحاث
قسم الأبحاث

الموضوع : طلب إجراء بحث

مدير إدارة مستشفيات القوات المسلحة بالمنطقة الشرقية

السلام عليكم ورحمة الله وبركاته

تجدون برفقة طلب إجراء بحث مقدم من طالب الدراسات العليا المقدم / احمد سعد الزهراني والمبتعث لدراسة الدكتوراه في مجال الإدارة الصحية من جامعة كيرتن باستراليا، حيث يرغب في القيام بأجراء دراسة في مستشفيات القوات المسلحة بالمنطقة الشرقية تحت عنوان "اتجاهات الممارسين السريريين نحو سلامة المرضى: دراسة باستخدام المنهج البحث العلمي المختلط ذو الصفة التوضيحية التتابعية في مستشفيات القوات المسلحة بالسعودية (المنطقة الشرقية)".
"Clinician Attitudes Toward Patient Safety: A sequential Explanatory Mixed Methods Study in Saudi Armed Forces Hospitals (Easter Region)"

نأمل الاطلاع وإكمال اللازم حسب المتبع لديكم وأشعارنا بما تم ، علماً بان الدراسة تم إجازتها أمنياً.

والسلام عليكم،،،

٩/٢٢
رئيس

اللواء/ الركن

عنه

عبيد بن منصور العدواني

مساعد مدير عام الإدارة العامة للخدمات الطبية

لشؤون التعليم والتدريب والأبحاث

نسخة إلى :

١- قسم الأبحاث بالخدمات الطبية

٢- الصادر

نسخة الخدمات الطبية للقوات المسلحة

Appendix E: Information for Participants



Participation information sheet

Clinicians' attitudes toward patient safety: A sequential explanatory mixed methods study in Saudi Armed Forces Hospitals (Eastern Region)

My name is Ahmed Alzahrani and I am a Doctoral student at Curtin University/ Western Australia and employee at the Saudi Armed Forces Medical Services. My supervisor is Dr. Jan Lewis at School of Public Health. The purpose of this study is to explore clinicians' attitudes (Physicians and Nurses) toward patient safety in the Saudi Armed Forces Hospitals. The knowledge gained from this study will be used to improve quality and safety of care in Saudi Arabia and allow health policy makers in Saudi Arabia in general and Armed Forces Medical Services in particular to identify opportunities for improvement; and the findings will be used as a baseline for assessing future safety improvement interventions.

You have been asked to participate in this study because you are healthcare professionals working at the Saudi Armed Forces Hospitals and your experiences and knowledge will be valuable to this research. Your participation will involve completing a survey. You may also be invited to participate in an individual interview. Participation in the study is voluntary. The survey will take approximately 15 minutes to complete. The findings of the survey will be used then to perform a series of interviews, which will take no longer than half hour. You will be asked to sign a consent form before participation. With your permission, interviews will be recorded and you have the right to decline to answer any question and at any time you may request that the recorder be switched off. You are also free to withdraw your participation from this research at any time without consequence.

The information you will provide will be anonymous. Your consent form and information transcribed from the interview will be used for research purposes and it will be kept at Curtin University for five years then destroyed. The researcher and his supervisors will be the only persons permitted access to the information. Final results of this study will be published in academic journals in form that does not identify you in any way.

This research has been approved by the Human Research Ethics Committee at Curtin University (Approval No. SPH-09-2011). If you have concerns about the research that you think I or my supervisors can help you with, please do not hesitate to contact me on my mobile (0540790930) or by email (a.alzahrani2@postgrad.curtin.edu.au) or Dr. Jan Lewis by email: (J.A.Lewis@curtin.edu.au). If you would like to contact someone at Curtin University regarding this study, you can contact the Human Research Ethics Committee on (phone: +61 9266 2784 or hrec@curtin.edu.au or in writing c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth WA 6845).

Thank you for your willingness to be involved in this study. Your participation is highly appreciated.

Appendix F: Consent Form for Phase One



Consent to Participate in Research Study (Questionnaire)

Clinicians' attitudes toward patient safety: A sequential explanatory mixed methods study in Saudi Armed Forces Hospitals (Eastern Region)

Student: Ahmed Saad Alzahrani

PhD Candidate

Supervisor: Dr. Jan Lewis

Associate Supervisor: Dr. Phillip Della

I _____ agree to participate in this study titled "*Clinicians' attitudes toward patient safety: A sequential explanatory mixed methods study in Saudi Armed Forces Hospitals (Eastern Region)*"

I understand that the purpose of this study is to explore clinicians' attitudes (Physicians and Nurses) toward patient safety in the Saudi Armed Forces Hospitals using a Safety Attitudes Questionnaire. The results of the survey will be used to perform semi-structured interviews.

I agreed to participate in this study by completing the attached Safety Attitudes Questionnaire. I understand that the survey will take approximately 15 minutes to complete.

I understand that information collected from the survey is anonymous and no identifying information will be kept about participants. I have been given an opportunity to ask questions. I understand that I am free to withdraw my participation from this research at any time without consequences or explanation.

I am aware that I can contact Ahmed Alzahrani, Dr Jan Lewis or Human Research Ethics Committee at Curtin University if I have any concerns about the research.

I agreed that the research data gathered from this research may be published in a form that does not identify me in any way.

Signature (Participant) _____/_____/_____
Date

Signature (Researcher or delegate) _____/_____/_____
Date

NOTE:

This study has been approved by the Human Research Ethics Committee at Curtin University (Approval No. SPH-09-2011) and approved by The Saudi Armed Forces Medical Services Department to be conducted in the Saudi Armed Forces Hospitals (Approval No. 9/4/12317 Dated 23/08/2011).

Appendix G: Consent Form for Phase Two



Consent to Participate in Research Study (Interview)

Clinicians' attitudes toward patient safety: A sequential explanatory mixed methods study in Saudi Armed Forces Hospitals (Eastern Region)

Student: Ahmed Saad Alzahrani PhD Candidature
Supervisor: Dr. Jan Lewis Associate Supervisor: Dr. Phillip Della

I _____ agree to participate in this study titled "*Clinicians' attitudes toward patient safety: A sequential explanatory mixed methods study in Saudi Armed Forces Hospitals (Eastern Region)*".

I understand that the purpose of this study is to explore clinicians' attitudes (Physicians and Nurses) toward patient safety in the Saudi Armed Forces Hospitals using a Safety Attitudes Questionnaire. The results of the survey will be used to perform semi-structured interviews.

I agreed to participate in interviews. I understand that the interview will take no longer than half hour. I give permission for the interview to be recorded.

I understand that information collected from interviews is anonymous and no identifying information will be kept about participants. I have been given an opportunity to ask questions. I understand that I am free to withdraw my participation from this research at any time without consequences or explanation.

I am aware that I can contact Ahmed Alzahrani, Dr Jan Lewis or Human Research Ethics Committee at Curtin University if I have any concerns about the research.

I agreed that the research data gathered from this research may be published in a form that does not identify me in any way.

Signature (Participant) _____
Date

Signature (Researcher or delegate) _____
Date

NOTE:

This study has been approved by the Human Research Ethics Committee at Curtin University (Approval No. SPH-09-2011) and approved by The Saudi Armed Forces Medical Services Department to be conducted in the Saudi Armed Forces Hospitals (Approval No. 9/4/12317 Dated 23/08/2011).

Appendix H: Permission To Use the SAQ

RE: Using The SAQ

Thomas, Eric <Eric.Thomas@uth.tmc.edu>

Fri 17/12/2010 10:32 PM

Archives

To: Ahmed Saad A Alzahrani <a.alzahrani2@postgrad.curtin.edu.au>;

You have my permission. In case you have not seen it, please go to our website (see below) for more information.

Eric

Eric J Thomas MD MPH
Griff T Ross Professor in Humanities and Technology
Director, UT Houston-Memorial Hermann Center for Healthcare Quality and Safety
Professor of Medicine
University of Texas Medical School at Houston
6410 Fannin UPB 1100.45
Houston TX 77030-3006
713-500-7958
www.utpatientsafety.org

From: Ahmed Saad A Alzahrani [mailto:a.alzahrani2@postgrad.curtin.edu.au]

Sent: Thursday, December 16, 2010 1:48 PM

To: Thomas, Eric

Subject: Re: Using The SAQ

Dear Professor Thomas

Hope that this email finds you well.

It is my pleasure to send this email to you. I'm a PhD student at Curtin University in Western Australia. I've just started last semester 2010. I'm conducting a research on patient safety. The purpose of my study is to explore Clinicians' attitudes toward patient safety at the Saudi Arabian Hospitals. I'm seeking your permission to use the Safety Attitudes Questionnaire to collect data. The questionnaire will be administrated using its original language (English) with minor modifications in term of demographic information and profession categories.

Kind Regards

Ahmed Alzahrani

Appendix I: Safety Attitudes Questionnaire

Serial No. (- - -)

Safety Attitudes Questionnaire
Please answer the following items with respect to your clinical area (your primary work area, unit, or department of the hospital where you spend most of your work time or provide most of your clinical services).

BACKGROUND INFORMATION

1.	Profession	<input type="checkbox"/> Physician	<input type="checkbox"/> Nurse				
2.	Clinical area (please mark one only):	<input type="checkbox"/> Dental <input type="checkbox"/> Intensive Care <input type="checkbox"/> Pediatrics <input type="checkbox"/> Surgery <input type="checkbox"/> Emergency <input type="checkbox"/> Internal Medicine <input type="checkbox"/> Preventive medicine <input type="checkbox"/> Urology <input type="checkbox"/> Family Medicine <input type="checkbox"/> Obstetrics/ Gynecology <input type="checkbox"/> Psychiatry <input type="checkbox"/> Other, please specify <input type="checkbox"/> E.N.T. <input type="checkbox"/> Ophthalmology <input type="checkbox"/> Radiology ()					
3.	Job Category (mark one only)	<input type="checkbox"/> Consultant Physician <input type="checkbox"/> Head Nurse/ Charge Nurse <input type="checkbox"/> Specialist / Registrar Physician <input type="checkbox"/> Nurse Consultant <input type="checkbox"/> Resident Physician <input type="checkbox"/> Specialist Nurse/ Registered Nurse <input type="checkbox"/> Nurse Technician					
4.	Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female				
5.	Age	<input type="checkbox"/> < 30	<input type="checkbox"/> 30-39	<input type="checkbox"/> 40-49	<input type="checkbox"/> 50 and above.		
6.	Nationality	<input type="checkbox"/> Saudi	<input type="checkbox"/> Non-Saudi (please write your citizenship and country of birth) Citizenship _____ Country of birth _____				
7.	Job Status	<input type="checkbox"/> MSD (please specify): <input type="checkbox"/> Military <input type="checkbox"/> Civilian <input type="checkbox"/> Contract					
8.	Usual Shift	<input type="checkbox"/> Days	<input type="checkbox"/> Evenings	<input type="checkbox"/> Nights	<input type="checkbox"/> Variable Shifts		
9.	Years of experience in specialty	<input type="checkbox"/> < 6 Mths	<input type="checkbox"/> 6 Mths -2 Yrs	<input type="checkbox"/> 3-7	<input type="checkbox"/> 8-12	<input type="checkbox"/> 13-20	<input type="checkbox"/> 21 +
10.	Years of work experience	<input type="checkbox"/> < 6 Mths	<input type="checkbox"/> 6 Mths -2 Yrs	<input type="checkbox"/> 3-7	<input type="checkbox"/> 8-12	<input type="checkbox"/> 13-20	<input type="checkbox"/> 21 +
11.	Level of education	<input type="checkbox"/> Diploma	<input type="checkbox"/> Bachelor	<input type="checkbox"/> Postgrad. Diploma		<input type="checkbox"/> Master	<input type="checkbox"/> PhD
12.	Total years of Education	<input type="checkbox"/> 1-3	<input type="checkbox"/> 4-7	<input type="checkbox"/> 8-10	<input type="checkbox"/> 11+		

No.	Items	Disagree Strongly	Disagree Slightly	Neutral	Agree Slightly	Agree Strongly
1.	High levels of workload are common in my clinical area.	<input type="checkbox"/>				
2.	I like my job.	<input type="checkbox"/>				
3.	Nurse input is well received in this clinical area.	<input type="checkbox"/>				
4.	I would feel safe being treated here as a patient.	<input type="checkbox"/>				
5.	Errors in the delivery of care are handled appropriately in my clinical area.	<input type="checkbox"/>				
6.	This hospital does a good job of training new personal.	<input type="checkbox"/>				
7.	All the necessary information for diagnostic and therapeutic decisions is routinely available to me.	<input type="checkbox"/>				
8.	Working in this hospital is like being part of a large family.	<input type="checkbox"/>				
9.	The administration of this hospital is doing a good job.	<input type="checkbox"/>				
10.	Hospital administration supports my daily efforts.	<input type="checkbox"/>				
11.	I receive appropriate feedback about my performance.	<input type="checkbox"/>				
12.	In this clinical area, it is difficult to discuss errors.	<input type="checkbox"/>				
13.	Briefings (e.g., patient report at shift change) are important for patient safety.	<input type="checkbox"/>				

No.	Items	Disagree Strongly	Disagree Slightly	Neutral	Agree Slightly	Agree Strongly
14.	Thorough briefings are common in my clinical area.	<input type="checkbox"/>				
15.	This hospital is a good place to work.	<input type="checkbox"/>				
16.	When I am interrupted, my patients' safety is not affected.	<input type="checkbox"/>				
17.	All the personnel in my clinical area take responsibility for patient safety.	<input type="checkbox"/>				
18.	Hospital management does not knowingly compromise the safety of patients.	<input type="checkbox"/>				
19.	The levels of staffing in my clinical area are sufficient to handle the number of patients.	<input type="checkbox"/>				
20.	Decision making in my clinical area utilize input from relevant personnel.	<input type="checkbox"/>				
21.	This hospital encourages teamwork and cooperation among its personnel.	<input type="checkbox"/>				
22.	I am encouraged by my colleagues to report any patient safety concerns I may have.	<input type="checkbox"/>				
23.	The culture in my clinical area makes it easy to learn from the errors of others.	<input type="checkbox"/>				
24.	This hospital deals constructively with problem personnel.	<input type="checkbox"/>				
25.	The medical equipment in my clinical area is adequate.	<input type="checkbox"/>				
26.	In my clinical area, it is difficult to speak up if I perceive a problem with patient care.	<input type="checkbox"/>				
27.	When my work load becomes excessive, my performance is impaired.	<input type="checkbox"/>				
28.	I am provided with adequate, timely information about events in the hospital that might affect my work.	<input type="checkbox"/>				
29.	I have seen others make errors that had the potential to harm patients.	<input type="checkbox"/>				
30.	I know the proper channels to direct questions regarding patient safety in my clinical area.	<input type="checkbox"/>				
31.	I am proud to work at this hospital.	<input type="checkbox"/>				
32.	Disagreements in my clinical area are resolved appropriately (i.e. not who is right but what is best for the patient).	<input type="checkbox"/>				
33.	I am less effective at work when fatigued.	<input type="checkbox"/>				
34.	I am more likely to make errors in tense or hostile situations.	<input type="checkbox"/>				
35.	Stress from personal problems adversely affects my performance.	<input type="checkbox"/>				
36.	I have the support I need from other personnel to care for patients.	<input type="checkbox"/>				
37.	It is easy for personnel in my clinical area to ask questions when there is something that they do not understand.	<input type="checkbox"/>				
38.	Disruptions in the continuity of care (e.g. shift changes, patient transfer, etc.) can be detrimental to patient safety.	<input type="checkbox"/>				
39.	During emergencies, I can predict what other personnel are going to do next.	<input type="checkbox"/>				
40.	The physicians and nurses here work together as well coordinated team.	<input type="checkbox"/>				
41.	I am frequently unable to express disagreement with physicians in my clinical area.	<input type="checkbox"/>				
42.	Very high levels of workload stimulate and improve my performance.	<input type="checkbox"/>				
43.	Truly professional personnel can leave personal problems behind when working.	<input type="checkbox"/>				
44.	Morale in my clinical area is high.	<input type="checkbox"/>				
45.	Trainees in my discipline are adequately supervised.	<input type="checkbox"/>				
46.	I know the first and last names of all the personnel I worked with during my last shift.	<input type="checkbox"/>				

No.	Items	Disagree Strongly	Disagree Slightly	Neutral	Agree Slightly	Agree Strongly
47.	I have made error that had the potential to harm patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48.	Physicians in my clinical area are doing a good job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49.	Fatigue impairs my performance during emergency situations (e.g. emergency resuscitation, seizure).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50.	Fatigue impairs performance during routine care (e.g. medication review, ventilator checks, and transfer orders).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51.	If necessary, I know how to report errors that happen in my clinical area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52.	Patient safety is constantly reinforced as the priority in my clinical area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53.	Interactions in my clinical area are collegial, rather than hierarchical.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54.	Important issues are well communicated at shift changes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55.	There is widespread adherence to clinical guidelines and evidence based criteria in my clinical area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56.	Personnel are not punished for errors reported through incident reports.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57.	Error reporting is rewarded in my clinical area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58.	Information obtained through incident reports is used to make patient care safer in my clinical area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59.	During emergency situations (e.g. emergency resuscitations), my performance is not affected by working with inexperienced or less capable personnel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60.	Personnel frequently disregard rules or guidelines (e.g. hand washing, treatment protocols/clinical pathways, sterile field, etc) that are established for my clinical area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61.	Communication breakdowns which lead to delays in delivery of care are common.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62.	Communication breakdowns which negatively affect patient care are common.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63.	A confidential reporting system that documents medical incidents is helpful for improving patient safety.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64.	I may hesitate to use a reporting system for medical incidents because I am concerned about being identified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65.	Have you completed this survey before?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				

Describe the quality of collaboration and communication you have experienced with						
	Very low	Low	Adequate	High	Very High	Not Applicable
Consultant Physician	<input type="checkbox"/>					
Specialist / Registrar Physician	<input type="checkbox"/>					
Resident Physician	<input type="checkbox"/>					
Head Nurse/ Charge Nurse	<input type="checkbox"/>					
Nurse Consultant	<input type="checkbox"/>					
Specialist Nurse/ Registered Nurse	<input type="checkbox"/>					
Nurse Technician	<input type="checkbox"/>					
Other (specify): _____	<input type="checkbox"/>					

Comments: What are your top three recommendations for improving patient safety? 1. 2. 3.
--

Thank you for completing the questionnaire- your time and participation are greatly appreciated.