

The Culture in Safety Culture: Exploration of Patient Safety Culture in Saudi Arabian Operating Theatres

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To my parents; Dhafer and Moneera

You made me who I am

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Abstract

Surgical patients are highly susceptible to preventable harm in health systems that tolerate inadequate patient safety: the World Health Organization recognises that half of preventable adverse events happen in surgical care. Each year, seven million surgical patients are estimated to suffer serious complications from adverse events and up to one million die. Improving safety culture and non-technical skills can reduce adverse events and improve patient safety. This study explores safety culture in operating theatres in Saudi Arabia, where many employees work in an environment that is radically different from their own, in a language that they know imperfectly. It targets cultural differences and their relevance to safety culture dimensions, including teamwork, communication, job satisfaction, stress recognition, working conditions, and perceptions of management.

The concept of safety culture is complex, and to achieve sufficient breadth and depth this study employs a sequential explanatory mixed methods design. All health care professionals working in operating theatres in the Saudi Arabian Ministry of Health hospitals in Riyadh City were surveyed using the internationally validated Safety Attitudes Questionnaire, administered in both English and Arabic. Items pertaining to local culture were added to assist in measuring cultural factors related to patient safety. Furthermore, twenty semi-structured interviews with non-Arabic-speaking female nurses were also conducted.

Returned surveys (n = 649; 60.8 % response rate) were subjected to reliability and validity tests. Cronbach's alpha values for each dimension ranged between 0.71 and 0.82, except for the perception of management dimension (0.44). Confirmatory factor analysis showed that all dimensions except perception of management had good psychometric properties, indicating the tool's applicability to Saudi Arabian context. Respondents' mean

perceptions ranged between 3.5 and 4 out of 5 for each dimension, which is comparable to similar studies in different international settings. Along with revealing significant differences between sites, analysis indicates that nurses, younger professionals, females and non-Arabic speaking professionals have significantly lower favourable perceptions of the dimensions under investigation, and that nurses rate their quality of communication with other professionals significantly lower than the ratings they received from them. Cultural background, including language, influences perceptions of the safety culture.

Communication, cultural background, and gender are found to comprise a new patient safety dimension, *multicultural workplace*. This dimension ($\alpha = 0.79$; $\bar{X} = 3.6$; $SD = 0.96$) has strong, positive correlations with other valid dimensions except stress recognition. Site, profession, and gender are significant predictors of this new dimension.

Both the open-ended questions and the semi-structured interviews reveal culture as an important factor, influencing several aspects of safety culture. Many issues were related to the concept of a multicultural workplace, and the strong correlation of this with other dimensions of safety climate indicates its relevance and importance to the safety culture. Nurses, of whom the majority were female and non-Arabic speaking, had significantly lower perceptions of safety culture than other respondents. The influence of context, gender, cultural background and language on safety culture is evident.

Cultural integration, initiated in classes about local culture and language, is recommended to bridge gaps between local and multinational workforces. Recommendations of enhancement to teamwork, communication, equity of team members and conflict resolution should provide a better, safer environment for hospital staff and patients if implemented.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Glossary

ACSNI	Advisory Committee on Safety of Nuclear Installations
ACSQHC	Australian Commission on Safety and Quality in Health Care
AHRQ	Agency for Healthcare Research and Quality (US)
ANOVA	Analysis of variance
CFI	Comparative fit index
CDSI	Central Department of Statistics and Information (Saudi Arabia)
DON	Director of nursing
FMAQ	Flight Management Attitudes Questionnaire
HSC	Hospital Safety Climate (survey)
HSD	Honest significant difference (Tukey's HSD test)
HSOPSC	Hospital Survey on Patient Safety Culture
IAEA	International Atomic Energy Agency
ICPS	International Classification of Patient Safety
ICU	Intensive care unit
IOM	Institute of Medicine (US)
KMO	Kaiser–Meyer–Olkin (measure)
Makkah	also known as Mecca
MOH	Ministry of Health (Saudi Arabia)
MSI	Modified Stanford Patient Safety Culture Survey Instrument
OPEC	Organization of Petroleum Exporting Countries
OR	Operating room
PCA	Principal Component Analysis
PIS	participant information sheet
PSCHO	Patient Safety Culture in Health Organisations (survey)
RMSEA	root mean square error of approximation
SAQ	Safety Attitude Questionnaire
SCS	Safety Climate Survey
SD	standard deviation
SRMR	standardised root mean square residual
TLI	Tucker–Lewis index
UK	United Kingdom
USA/US	United States of America
WHO	World Health Organization

Chapter 1: Introduction

In spite of the ancient origins of the maxim “above all, do no harm”, (Smith, 2005), it is still relevant in the modern age. This aphorism, applied to medical and nursing practice, prioritises patient safety over potentially risky treatments and may lead a health care professional to decide not to conduct a certain form of treatment or, indeed, not to conduct any treatment. *Florence Nightingale* (1863, p. iii) acknowledged the relevance of patient protection to the health system in general by stating that “it may seem a strange principle to enunciate as the very first requirement in a Hospital that it should do the sick no harm”. These axioms are constant reminders of the risks imposed by health care to patients and the potential for adverse outcomes—that is, harm resulting from the health care that patients receive rather than from their underlying illness or disease.

This study investigates patient safety culture in operating theatres in Ministry of Health (MOH) hospitals in Riyadh, the capital city of Saudi Arabia. It employs a mixed methods approach to achieve breadth and depth in the understanding of issues impacting on patient safety. This chapter introduces the study by exploring and presenting the context. It states the primary research aim, its significance and its main questions, and outlines the thesis structure.

1.1. Saudi Arabian context

1.1.1. Saudi Arabia

Saudi Arabia occupies more than two million square kilometres of the Arabian Peninsula in the Middle East (Central Department of Statistics and Information [CDSI], 2013). It shares borders with eight countries and has two water frontiers: the Red Sea in the west and the Arabian Gulf in the east (Figure 1). It is a Monarchy in which the King is also

the Prime Minister. Managerially, it is divided into 13 regions with 118 governorates (CDSI, 2013). Saudi Arabia has gained international significance for two main reasons. Firstly, two Muslim holy places, Makkah (Mecca) and Almadinah Almunwarah, are located in Saudi Arabia, giving the area a spiritual and international influence that has lasted for more than 14 centuries (Mufti, 2000). Secondly, the discovery of oil in commercial quantities in 1938 has given the country great influence in the modern world (Mufti, 2000). Saudi Arabia, as an establishing member of the Organization of Petroleum Exporting Countries (OPEC), is the largest oil exporter, and has the second largest proven oil reserve in the world (OPEC, 2014). In 2013, oil revenues made up more than 90% of Saudi Arabia's financial budget of more than a trillion Saudi riyal (over US\$300 billion) (Ministry of Finance, 2013). World Health Organization (WHO) (2013) claims that the significant international influence of oil has allowed the country to improve the living standards of its people. Despite dramatic change in the conditions of the people and the country, less noticeable change has occurred at the cultural level as discussed in the following sub-heading.



Figure 1: Saudi Arabian Map (Operation World, 2014)

1.1.2. Saudi culture

Historically, the nation is an amalgamation of several self-autonomous tribal areas, which were unified into one country in 1932 (Mufti, 2000). Despite Saudi Arabia being a fairly young country, its people have a culture that has lasted for thousands of years. Common cultures shared by members of a certain tribe or region (Gallagher & Searle, 1985) usually develop and are refined over several centuries before the country becomes unified.

Similarities and differences existed within the traditional tribal cultures. Several factors played a major role in their development and modification; however, geographical location and religion were deemed to be the two most important (Gallagher & Searle, 1985; Searle & Gallagher, 1983). The diverse geography of Saudi Arabia contributed to widening differences between its peoples, but religion has helped create commonalities that unify it along with these different tribal cultures being part of the general Arabic Culture. The influences of these factors on micro-level cultures were particularly important prior to the unification of the country (i.e., before the beginning of the 20th century).

The geography of a country influences people and their culture in different ways. Weather, type of soil, and sources of water and food are examples of the influence of geography on certain cultures (Crang, 2013). In addition, the geographical location of tribes in Saudi Arabia influenced their cultures differently, and is still evident in differences between cultures in the western parts of the country to those in the central regions (Bjerke & Al-Meer, 1993). Makkah, the holy place, is located in the western part of the country, and that region has long been influenced by constant exposure to visitors and pilgrims from all over the world. In contrast, people from the central regions rarely see anybody other than people from their tribe or neighbouring tribes, resulting in more conservative cultures (Searle & Gallagher, 1983; Vogel, 2000). Religion, that is, Islam, has played an important role in shaping the Saudi culture (Gallagher & Searle, 1985).

Since the unification of the country, a unified Saudi culture has emerged that has been shaped by different factors. Most importantly, Saudi people and their culture have been changed by the wealth generated since the discovery of oil in 1938 (Gallagher & Searle, 1985; WHO, 2013). It resulted in free education (all levels including tertiary) and health and no taxes (Luna, 1998). This changed all aspects of life for the Saudi people. Sudden wealth generated from large export of oil, lack of skilled people due to recent background of illiteracy and the resilience of folk beliefs against modernisation result in the dependence on the skills of expatriate workers (in all aspects of modern life including the provision of modern medicine) who arrived in large numbers (Gallagher & Searle, 1985; Mufti, 2000). Despite increases in the numbers of educated and skilled locals, more than one-third of the population, which is more than half of the working population, is made up of people from different nationalities (CDSI, 2013).

Although the noticeable modernisation and industrialisation of Saudi Arabia imposed radical changes to lives of its people, the society remained traditionally oriented (Luna, 1998). One obvious character is the domination of gender segregation, where unrelated men and women are not supposed to mingle with each other beyond what was considered socially necessary (AlMunajjed, 1997), on all aspects of Saudi life. Gender-based schools, colleges, work places and even banks (gender-singularity is enforced) were created in response to public demand (Aldossary, While, & Barriball, 2008; AlMunajjed, 1997; Mackey, 2002). Examples of this separation were women teaching girls in female-only schools and colleges, or working in female-only branches of banks and government sectors that served only women, while males worked and taught in male-only schools and work places.

Health care institutions were the only exception to this separation because of the need for qualified health care workers to work together to treat patients regardless of gender (Al-Shahri, 2002). Despite hospitals being open to all, different wards were

allocated to each gender, and separate coffee rooms were provided for male and female staff. Gender separation was evident in all aspects of Saudi Arabian culture.

1.1.3. Saudi population

One of the main challenges in Saudi Arabia—for the government in general and the health system specifically—has been its rapid population growth (Walston, Al-Omar, & Al-Mutari, 2010). In 1974 the population was just over seven million; by 2013 it had reached 30 million (CDSI, 2013). The population is not evenly distributed, with more than half located in only two of the 13 regions in the country, Riyadh and Makkah (CDSI, 2013). This is no surprise given that Makkah is the religious capital and Riyadh the administrative capital. Riyadh is the most populous city in Saudi Arabia by far, with a population of about six million, followed by Jeddah (part of the Makkah region) with about four million and Makkah city with about two million (CDSI, 2013). In addition to the reliance on expatriate health care workers, both the rapid population growth and the unbalanced population density have been major challenges for the health care system in the country.

1.1.4. Health care system in Saudi Arabia

Historically, people depended on traditional and spiritual medicine as their health care system. They used various herbs and different scripts from the holy Quran for their healings. They also used cauterization (Khan & Khan, 2000): this involved traditional healers deliberately inducing burns using thin hot rods on certain areas of the patient's body to invoke healing. This method as well as other traditional medicine are still in use and highly regarded as a healing practice (Abdullah, 1993; Malone & Al Gannass, 2012; Qureshi, Al-Amri, Abdelgadir, & El-Haraka, 1998).

The country established a Health Department in 1926 as the first form of organised health service (Mufti, 2000). However, real improvement was only achieved after the

establishment of the Ministry of Health (MOH) in 1954 (Al-Mazrou, Khoja, & Rao, 1995). Currently Saudi Arabia's health care system is divided into three sectors: the MOH, other governmental health sectors (e.g., military hospitals and university hospitals) and the private sector. Most health services in Saudi Arabia are provided by the MOH, which provides 59.5% of all beds in the country, followed by the private sector (21.2%) and the other governmental sectors (19.3%) (MOH, 2012). The MOH provides health services to the general public; other governmental health sectors serve particular groups of the population. For example, military hospitals are funded and run by the Ministry of Defence and Aviation and provide health services only to military personnel and their families.

English was adopted as the formal language in health care facilities for two reasons (Brown & Busman, 2003; Luna, 1998; Tumulty, 2001; Walston et al., 2010). The first was that the health system was built on the principles of Western medicine, with no accommodation for any part of traditional medicine. In spite of modern medicine being practiced and recognised internationally (Asuni, 1979), it was new practice for the traditional Saudi Arabian people (Abdullah, 1993). The second was that the system was dependent on expatriate health care workers, most of whom did not speak Arabic, the local language. Establishing a totally new practice of medicine provided by people from other cultures who spoke strange languages created some resistance among local patients, although it eased over time as the system progressed and proved successful.

Saudi Arabia's health care system has been challenged by the lack of its own health care workforce. According to the latest MOH statistics (MOH, 2012), approximately three-quarters of the doctors and nurses in the Saudi Arabian health system are of other nationalities, that is *expatriates* – defined as people living or working in countries other than where they were raised (Vance, 2005). This problem is exacerbated by their short tenure—around two years on average in Saudi Arabia (Walston et al., 2010). Such a transitional workforce may have a negative impact on the safety and quality of health care

provided. In addition, communication within such a multicultural and transitional workforce could, in theory, be sub-optimal, thereby threatening patient safety.

An arising issue that may add to the magnitude of the health care worker problem is the massive increase in both the number of health education graduates and new health care facilities. Since 2006 the number of health education colleges and universities has increased more than fivefold. During this same time the number of hospital beds has increased steadily, either in new health institutions or by increasing the capacity of established institutions. The deputy health minister announced that the number of beds of in Saudi Arabia (beds in the country in 2013 = 62,000; MOH beds = 38,000) would be doubled (beds in the country = 120,000; MOH beds = 73,000) by the end of 2018 (Allothman, 2013; MOH, 2014). According to MOH statistics, in 2012 Saudi Arabia employed 303,578 health care workers, including 211,219 physicians and nurses; Saudi physicians and nurses constituted only 32.1% (n = 67,847) of this number (MOH, 2012). Given this situation, the Saudi health system will continue to rely heavily on international health care workers for an extended period of time, despite the increase in the number of Saudi graduates. Such a massive increase in the health system's capacity will necessitate the recruitment of a large number of health care workers.

Training for international health care workers, in the nature of the Saudi work environment and patients, and the newly graduating local health care workers, to get the required skills, pose challenges to the Saudi health system. The massive number of trainees could affect health care standards and patient safety when the balance between experienced and inexperienced health care workers is disturbed over a short period of time. Every organisation has a certain capacity to take on new employees and train them, but exceeding that threshold could result in an environment that is vulnerable to errors (Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2009). The current study will investigate patient safety within this radically changing health system.

1.2. Aim and significance of the study

As surgical skills are important in the surgical field, non-technical skills are also important for patient safety and wellbeing. Several strategies have been shown to improve patient safety in health care facilities, one of which is to assess and improve safety culture (Guldenmund, 2000; Kohn, Corrigan, & Donaldson, 2000; Leape, 2008). However, no improvements can be made without a thorough understanding of the important contextual issues related to safety culture (Cooper, 2000; Guldenmund, 2000; Pronovost & Sexton, 2005). This study aims to inform the development of patient safety improvement strategies in the context of Saudi Arabian operating theatres in Saudi Arabia by investigating the safety culture, using mixed methods approach. Operating theatres were considered one of the highest error-prone environments with high volume of significant complications and lethal consequences internationally (Leape, 1994; WHO, 2009). The most vulnerable areas usually benefit the most from investigations and improvement efforts (Schwendimann, Zimmermann, Küng, Ausserhofer, & Sexton, 2013).

Issues particular to improving patient safety include how health care professionals from different cultural and linguistic backgrounds work and communicate with each other and their (mainly Saudi) patients, what factors impact on patient safety culture and climate, and how the health system deals with its workforce. By understanding the important aspects of safety culture in a specific context such as in operating theatres, informed recommendations can be made that, if adopted, should contribute to a better safety culture and, ultimately, better patient safety.

This study is significant as it establishes a baseline or benchmark for the safety culture and patient safety in operating theatres in Saudi Arabia. The recommendations generated in this study may be applicable to countries with similar cultures, such as the Gulf countries, and even to countries with distinctly different cultures that have parallel

situations in their health systems, particularly of health care workers who speak a language different to that of their patients.

1.3. Research questions

This thesis seeks to answer four main questions, with sub-questions used to focus the answers:

- 1- What is the current safety climate in the operating theatres in the MOH's hospitals in Riyadh?
 - a. What are the main characteristics of the perioperative teams and do they differ between hospitals?
 - b. What characteristics of individuals are related to perceptions of safety culture?
 - c. How valid and reliable is a Western-based instrument in describing the Saudi Arabian context?
- 2- How do healthcare professionals rate the quality of communication with members of other surgical disciplines?
- 3- What, if any, areas of patient safety can be improved in the operating theatres?
- 4- What aspects of Saudi local culture could have an influence on patient safety?

1.4. Thesis structure

Investigating patient safety in Saudi Arabian operating theatres using a *mixed methods approach*, this thesis is reported in eight chapters divided as follows:

This first chapter, *Introduction*, has provided an introduction to the study, highlighting the importance of studying patient safety in operating theatres, especially in Saudi Arabia. It has also provided background about Saudi Arabia and its culture and people, the health system and the health workforce. It has outlined the research aims and significance, research questions and the thesis structure.

Chapter 2, *Literature Review*, presents a review of the literature relevant to the research topic, including a critical evaluation of relevant studies.

Chapter 3, *Methodology*, presents the methodological background and the methodology adopted for the current study.

Chapter 4, *Methods*, presents both methods used for the data collection and analysis of the survey and interviews.

Chapter 5, *Survey Results*, and Chapter 6, *Interview Findings*, both present the results and findings of the survey and the interviews.

Chapter 7, *Discussion*, presents the integration and discussion of both results.

Chapter 8, *Conclusion*, summarises the study and presents the recommendations.

Chapter 2: Literature Review

We cannot change the human condition, but we can change the conditions under which humans work – Reason, 2000, p. 769.

The previous chapter introduced the research problem and context. This chapter follows by defining the topic's terminology and providing the historical development of patient safety. It presents a review of the relevant literature on different aspects of patient safety, including strategies used to improve patient safety internationally and in Saudi Arabia. This study reviewed and evaluated previous research critically to determine important foundations in safety science in general and, more specifically, in patient safety.

2.1. Search strategy

An extensive search was conducted to collate the literature relevant to the research topic. This search used combinations of the following keywords: patient safety, safety, culture, safety culture, safety climate, non-technical skills, incident, sentinel, iatrogenic, adverse events/incidents, near miss, error, human error, system error, hospitals, health care, healthcare, operating theatre/room/department, perioperative and Saudi Arabia. The search was conducted using online search engines including PubMed, Cochrane, Embase, Scopus, Web of Science and CINAHL. The search was limited to English and Arabic language and was conducted throughout the study (from early 2011) until mid-2014.

2.2. Patient safety terminology

Patient safety is a term used to indicate the developing science of preventing harm to patients. Patient safety is diversely defined and conceptualised throughout the literature. This recognised diversity has initiated efforts to unify and classify patient safety definitions

and conceptualisation (Donaldson, 2009; Runciman et al., 2008; Runciman et al., 2009; Sherman et al., 2009; Thomson et al., 2009; World Alliance for Patient Safety, 2009). The WHO World Alliance for Patient Safety has led the way, developing the International Classification of Patient Safety (ICPS) (Runciman et al., 2009). One of the main aspects of the ICPS's final technical report is the provision of definitions of patient safety terminology (World Alliance for Patient Safety, 2009).

Patient safety is defined as “the reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum” (World Alliance for Patient Safety, 2009, p. 15). Health care-associated harm is then defined as “harm arising from or associated with plans or actions taken during the provision of healthcare, rather than an underlying disease or injury” (World Alliance for Patient Safety, 2009, p. 15). This definition narrows the focus of patient safety efforts to preventable risks. The debatable “acceptable minimum” is further referred to as “the collective notion of given current knowledge, resources available and the context in which care was delivered weighed against the risk of non-treatment or other treatment” (World Alliance for Patient Safety, 2009, p. 15). These explanations highlight the importance of context in achieving patient safety.

The presence of risk in health care settings is acknowledged and it is targeted to be reduced. The risks that are referred to in patient safety literature can lead to an incident, defined as “an event or circumstance that could have resulted, or did result, in unnecessary harm to a patient” (World Alliance for Patient Safety, 2009, p. 15). Incidents in which there is the possibility of harm to patients are commonly known as near misses, while those that result in actual harm are known as adverse events. Patient safety is more concerned with preventable incidents in which unnecessary harm occur. It has been estimated that about half of the patient safety incidents in health care are preventable (de Vries, Ramrattan, Smorenburg, Gouma, & Boermeester, 2008; WHO, 2009).

Preventable incidents are linked to errors, violations, abuse and deliberate unsafe acts (World Alliance for Patient Safety, 2009, p. 16). Errors, probably due to their unintentionality, receive the most attention in patient safety assessment and interventions. The landmark report by the Institute of Medicine (IOM) states that “ensuring patient safety involves the establishment of operational systems and processes that minimize the likelihood of errors and maximize the likelihood of intercepting them when they occur” (Kohn et al., 2000, p. 217). An error is defined as the “failure to carry out a planned action as intended or application of an incorrect plan” (World Alliance for Patient Safety, 2009, p. 22). In the medical context, an error can occur when planning or conducting treatment, either by taking the wrong action or failing to carry out the right action. Such errors take different forms, including diagnostic errors, treatment errors, medication errors, equipment failure and preventive errors (Kohn et al., 2000). Fewer errors would result in fewer adverse events that, in turn, would mean less harm to patients.

2.3. Prevalence of adverse events worldwide

In the United States of America (USA), adverse events result in an estimated 44,000 to 98,000 deaths annually: more than half of them (58%) are preventable (Kohn et al., 2000). In addition to often having lethal consequences, adverse events result in serious injuries and disabilities. Adverse events are estimated to cost the US economy about US\$29 billion annually (Kohn et al., 2000). More recently it has been estimated that between 210,000 and 400,000 preventable deaths occur in US hospitals each year (James, 2013). Serious, but not lethal, adverse events are estimated to be 10 to 20 times higher than the lethal figures: that is, between two and four million serious adverse events annually (James, 2013).

In Australia it has been estimated that 16.6% of hospital admissions experience adverse events, with about half (51%) having a high likelihood that they could have been

prevented (Wilson et al., 1995). Such adverse events cost the country more than an estimated A\$2.2 billion annually (Runciman & Moller, 2001). Surgical adverse events are estimated at 21.9% of hospital admissions, with 48% highly preventable (Kable, Gibberd, & Spigelman, 2002). Similar results have been reported by the Department of Health in the United Kingdom which found that one in 10 admissions (10%) results in an adverse event, cumulatively costing the health system more than £2 billion annually (Vincent, Neale, & Woloshynowych, 2001). Baker and colleagues (2004) report that 7.5% of admissions in Canadian hospitals are associated with adverse events, more than a third of them (36.9%) preventable.

On a broader scale, de Vries et al. (2008) indicate in their systematic review that the median global average rate of adverse events was 9.2% of hospital admissions. In other words, almost one in 10 admitted patients suffers an adverse event. These can result from unpreventable results such as complications inherent in a disease or procedure, but de Vries and colleagues (2008) indicates that almost half (43.5%) of such events are preventable. Their review included developed countries with health systems considered superior to those of developing countries for several reasons, including higher budgets, more research, more educated staff and more resources.

Wilson and colleagues' (2012) report of eight developing countries, Egypt, Jordan, Kenya, Morocco, Tunisia, Sudan, South Africa and Yemen, found that a diverse range of adverse events occur at rates ranging from 2.5% to 18.4%, an average annual rate of 8.2%. Interestingly, 83% of those adverse events were claimed to be preventable and 30% were associated with death. Statistics from Saudi Arabia about adverse events have not been located.

2.4. Patient safety in operating theatres

Patient safety is sometimes investigated at the hospital level, which is not sensitive to differences in departmental cultures. Pronovost and Sexton's (2005) study of more than 500 hospitals found that department-focused investigations and interventions, rather than hospital-imposed standards, improve safety and teamwork climate. Routine work in the wards differs from that in critical care units: it is also assumed that cultures in different clinical places are different. Solving any problem requires a thorough understanding of the problem and the settings at unit level, and the problem of patient safety cannot be solved without fully understanding health care settings and appreciating the differences between departments.

Globally, the operating theatre department is one of the busiest places in the health care system. It has been estimated that approximately 234 million major surgeries are undertaken every year (Weiser et al., 2008): in other words, one in every 25 human beings undergoes major surgery annually (WHO, 2009). Leape (1994) asserts that the operating theatre department is the most common place for errors to occur in hospitals. On a global scale, the World Health Organization (2009) has concluded that about half of all known adverse events in health care occur during surgical care. The WHO also estimates that every year seven million patients suffer significant complications, and that an estimated one million die either during or immediately after surgery.

The WHO (2009) presents four challenges to improving surgical safety in operating theatre departments. First, surgical safety is not recognised as the significant public health concern that it is. Second, there is a lack of basic, routine data that could be used to diagnose and improve safety in operating theatre departments. Third, the lack of adherence to existing safety policy and procedures creates problems. The fourth challenge is the complexity of the work conducted in operating theatre departments. The operating department is usually compared to high-risk organisations in other fields because of the

complexity of its work (Mazzocco et al., 2009). The treatment protocol, high-risk environment, high level of technology, accurate coordination and changing conditions all contribute to the complexity of the work in the operating department (Christian et al., 2006; Mazzocco et al., 2009). Just as the technical complexities are recognised, so too is the importance of teamwork for surgical safety (Manser, 2009; WHO, 2009).

Surgical safety in the operating department comprises technical and non-technical skills. Non-technical skills refer to cognitive skills such as teamwork, communication, leadership and decision making, to name a few (Yule, Flin, Paterson-Brown, & Maran, 2006). Non-technical skills are found to be as important as technical skills in maintaining patient safety during surgical procedures. For example, problems in communication are a causative factor in 43% of errors in surgical procedures (Gawande, Zinner, Studdert, & Brennan, 2003). Non-technical skills are general and relevant to all members of any given team, especially in operating theatres. Several strategies can be adopted to reduce errors and to prevent them from causing harm.

2.5. Strategic reduction of adverse events

Different approaches have been taken to reduce errors and adverse events in the medical field as in other high-risk fields such as aviation and nuclear technology. Major contributions to improvements in error-reduction efforts have been achieved by understanding the nature of errors. Reason (1990) classifies errors as human and non-human. Non-human errors are related to equipment and technology failure that contributes to errors. The term *safety-engineered device* is widely used to refer to devices which include safety mechanisms to reduce errors and faults (Gaba, 2000). However, medical treatments are human-based, and equipment and devices play only a supportive role: in other words, health care workers use different devices to help them treat their patients

(Bates et al., 2001; Bates et al., 1998; Leape et al., 1995). Thus, the focus of safety scientists has been on human error.

Human error is one of the most commonly cited causes of medical adverse events (Leape, 1994; Pelletier, 2001; Wilson et al., 1995). Human errors in general are referred to as slips, lapses and mistakes (Reason, 1990). In simplified terms, slips are actions not carried out as intended, lapses are an omission of actions required from memory failure or forgetfulness, and mistakes refer to the conduct of wrong actions. Leape (1994, p. 1853) reclassifies human errors into skill-, rule- and knowledge-based errors. He explains that skill-based errors are unconscious errors in performing an automatic activity or skill, rule-based errors result from the application of an incorrect rule to solve a certain problem, and knowledge-based errors result from a lack of knowledge or misinterpretation. Based on Reason's (1990) classification of human errors, Leape (1994) argues that skill-based errors are "slips" whereas rule- and knowledge-based errors are "mistakes".

Human errors are inevitable because humans are naturally prone to error (Cuschieri, 2006). Therefore, the focus of researchers has moved from attempting to perfect human beings by making them infallible, to perfecting their work environment by making it harder to make errors. Reason (1990) proposes the "Swiss-cheese model" where defence lines are created to intercept errors before they can result in accidents or adverse events. For example, using a computerised physician-order entry system to safeguard against medication prescription errors reduces medication errors by 60% to 80% (Bates et al., 1998; Bates et al., 1997).

Management of and reaction to errors have been classified by Reason (2000) into two main approaches: system approach (for latent errors) and person approach (for active errors). Unlike the person approach, where unintentional errors are associated with workers instead of the institution, errors under the system approach are perceived as a consequence rather than a cause. Reason (2000, p. 768) identifies the need to improve the system

because “though we cannot change the human condition, we can change the conditions under which humans work”. In health settings, Stock, McFadden, and Gowen III (2007) argue, the focus of error-reduction strategies has shifted from the person approach to the system approach since the IOM (Kohn et al., 2000) report, which emphasises the need to improve safety culture in health organisations in order to improve patient safety. It is argued that safety culture is based on integrated patterns of shared beliefs and values about safety between institutions and their workforce (Kizer, 1999; Weaver et al., 2013). The Committee on Quality of Health Care in America (IOM, 2001, p. 79) argues that changing a culture from seeing errors as individual failures into seeing them as opportunities for system improvement is “the biggest challenge to moving toward a safer health system”. More than a decade later, Weaver and colleagues (2013) found evidence in their systematic review that patient safety is improved through improvement to the safety culture.

2.6. Safety culture and safety climate

An overview of *culture*, as an important and relevant aspect of safety culture, is presented and followed by a review of the concepts of *safety culture and safety climate*. Culture is defined anthropologically as consisting

In patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values. (Kluckhohn, 1951, p. 86)

The concept of culture is relevant to different fields (Mead & Andrews, 2009). In the field of management, Hofstede (1984, p. 82) defined culture as “the collective programming of the mind which distinguishes the members of one group or society from those of another” emphasising the existence of differences between people based on their

cultural backgrounds. He then continued describing the influence of culture and cultural backgrounds on people and behaviours by stating that

Culture is reflected in the meanings people attach to various aspects of life; their way of looking of the world and their role in it. ... Culture, although basically resident in people's minds, becomes crystallized in the institutions and tangible products of a society. (1984, p. 82)

This influence establishes the connection between the concept of anthropological culture with other forms of culture (i.e. organisational culture) through people belonging to the first and working in the latter.

Hofstede referred to the influence of culture on people as a mental program within the *software of the mind*, as in the title of his book (1991). Culture was distinguished from other *programs* as it is completely learned. Figure 2 showed that the mind is influenced by three levels of programming. The basic level is human nature, such as the feeling of fear or happiness, which is universal to all mankind and completely intrinsic. The expression of these feelings is controlled by what is accepted and learnt culturally (group culture); second level. The third level is the individual personality which is both inherited and learned. Culture, as it is completely learned, can be manipulated and probably changed, to some extent, despite its relative stability (Guldenmund, 2000; Hofstede, Hofstede, & Minkov, 2010; Schein, 2010).

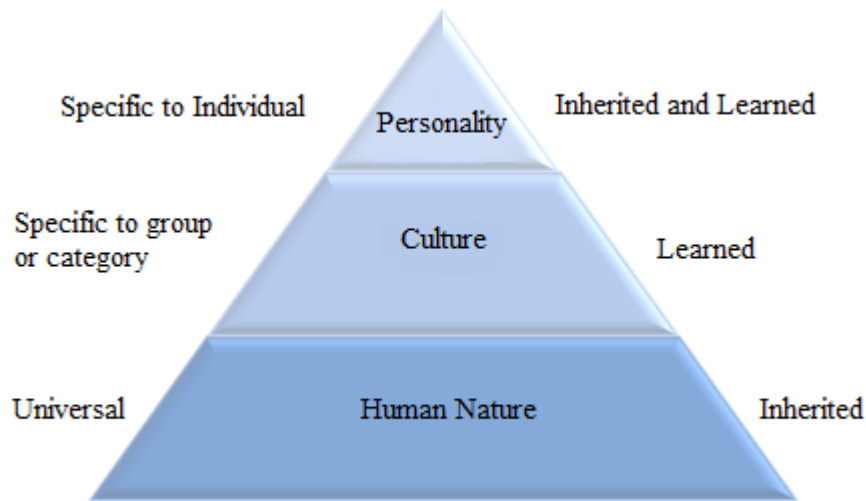


Figure 2: Three levels of mental programming (Hofstede et al., 2010, p. 6).

The term culture has been used in different contexts beyond the original anthropological perspective, and nowadays is a fluid term that can be used to describe a wide range of social aspects ranging from societies, races and nations to specific behaviour or perceptions such as organisational or safety cultures. Schein (2010, p. 2) divides culture into four categories (Figure 3). The first is “macroculture”, which he identifies as a culture that exists globally, such as an ethnic, religious, or nationwide culture. A good example of a macroculture is the followers of a certain religion who share beliefs that shape their lives despite geographical separation. The second category is “organisational culture”, which is exemplified in any given organisation despite its nature of work and refers to organisations that make up societies. The third category is “subculture”, which make up organisational cultures and can take the form of professional groups. The fourth level is “microculture”, subgroups or teams within larger categories. Depending on the context in which these categories are viewed, they can exist as major categories with subcultures, or as a subculture of other major categories. For example, medicine could be looked at as a subculture of the hospital (organisational culture); however, it could also be looked at as a macroculture (global) with subcultures such as surgical and internal medicine. Culture,

hereafter, refers to macroculture level represented in national and ethnic background unless otherwise stated.

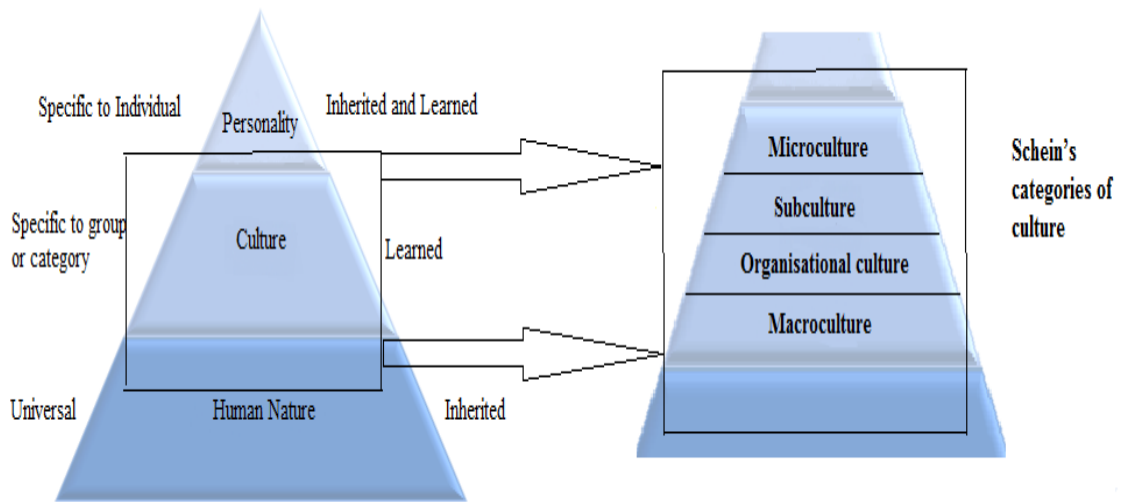


Figure 3: Schein's different categories of culture mapped to Hofstede et al.'s mental programming levels

The term *safety culture* was first introduced by the International Atomic Energy Agency (IAEA)'s initial report into the Chernobyl nuclear accident in 1986 (Lee, 1998). It gained importance because of its relevance to investigations of high-profile accidents such as the Kings Cross underground station's fire (Fennell, 1988), Clapham Junction's train crash (Hidden, 1989) and the Piper-Alpha oil platform explosion (Cullen, 1990), to name but a few. It was concluded, across different accidents, that safety was breached not because of the lack of safety regulations, but because of the nature of the safety culture and climate in those organisations (Advisory Committee on Safety of Nuclear Installations [ACSNI], 1993).

Researchers and investigators have emphasised the importance of safety culture as a key element for successful organisations (Gaba, Singer, Sinaiko, Bowen, & Ciavarelli, 2003). The most reported definition of safety culture is the Advisory Committee on Safety

of Nuclear Installations' definition (Guldenmund, 2000; Halligan & Zecevic, 2011), which defines the safety culture of a given organisation as “the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management” (ACSNI, 1993, p. 23). Simply defining safety culture is not sufficient to understand and comprehend its meaning. Organisations with a desirable and positive safety culture are characterised “by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures” (ACSNI, 1993, p. 23). The definition and characteristics of safety culture are in general terms for both industrial and health organisations. Health and safety management in health organisations includes the safety of both health care workers and their patients.

Geller (1994) presents ten principles that form what he calls *total safety culture* in any given workplace: employee-driven safety policy and procedures; a behaviour-based approach; a focus on safety process not outcomes; a view of behaviour being directed by activators and motivated by consequences; focus on achieving success, not avoiding failure; observation and feedback on work practices; effective feedback through behaviour-based coaching; observation and coaching as key activities; the importance of self-esteem, belonging and empowerment; and safety as a priority rather than a value. He models safety culture into three distinct, dynamic and interactive factors: person, behaviour and environment (Geller, 1994).

A similar model is provided by Cooper (2000), who classifies safety culture into psychological, behavioural and situational components, with recognition of the presence of reciprocal relationships among them. Cooper replaces Geller's *person* and *environment* with *psychological* and *situational*. He refers to psychological components as values, beliefs and attitudes about safety and indicates that they can be investigated through safety climate questionnaires. The behavioural component is referred to as competencies and

patterns of behaviour that can be measured through behavioural safety initiatives such as checklists. Finally, the situational component refers to the organisational safety system and sub-systems that can be assessed through safety management audits (Cooper, 2000, p. 120).

Cooper (2000, p. 114) argues that safety culture is mainly defined as something that the organisation *is* rather than something that the organisation *has*. Unlike the latter view, the “functionalist view”, where safety culture is looked at as fulfilling a pre-determined function within an organisation, in the former view, the “interpretative view”, safety culture is argued to be an emergent property of social groupings (Cooper, 2000, p. 114). It was argued that the majority of safety culture researchers believe that safety culture emerges from the safety values, attitudes and behaviours of a given organisation’s members; however, safety climate is also referred to as the individual’s aggregated attitudes and perceptions about safety (Flin, Mearns, O’Connor, & Bryden, 2000; Guldenmund, 2000). *Safety culture* and *safety climate* are often used interchangeably in the literature, and some researchers debate whether they describe the same concepts (Halligan & Zecevic, 2011; O’Connor, O’Dea, Kennedy, & Buttrey, 2011).

The most accepted definition of safety climate is

The surface features of the safety culture discerned from the workforce’s attitudes and perceptions at a given point in time ... It is a snapshot of the state of safety providing an indicator of the underlying safety culture of a work group, plant or organisation (Flin et al., 2000, p. 187).

In Guldenmund’s (2000) review, safety climate is argued to measure the safety attitude while safety culture is actually what shapes and drives that attitude. Most studies that define safety culture and safety climate use safety climate as the measurable elements that describe the safety culture (Halligan & Zecevic, 2011), or simply “the measurable

components of safety culture” (Colla, Bracken, Kinney, & Weeks, 2005, p. 364). Safety culture is considered to be a sub-set culture of organisational culture (Cooper, 2000; Frazier, Ludwig, Whitaker, & Roberts, 2013), and researchers have called for the concept of safety culture to be studied within the broader context of organisational culture (Frazier et al., 2013; Guldenmund, 2000).

2.7. Organisational culture and climate

Historically, safety culture and safety climate are derived from organisational culture and climate, both of which have been extensively researched since the 1970s and 1980s (Guldenmund, 2000). The definitions of organisational culture and climate overlap, and the differences between them are not clear. Verbeke, Volgering and Hessels (1998) note that more than 50 different definitions exist of the concept of organisational culture. Reichers and Schneider (1990) argue that organisational climate lacks consistency in definition and conceptualisation. Safety culture and safety climate also inherit this lack of clarity (Flin et al., 2000).

The concept of organisational climate preceded the concept of organisational culture by almost 20 years (Reichers & Schneider, 1990) but the concepts were not separate from each other and the term *organisational culture* replaced the term *organisational climate* in the 1980s (Guldenmund, 2000). This created an overlap in the definition and conceptualisation of both concepts. Despite pointing out the different origins of the concepts (climate from social psychological disciplines, culture from anthropology), Glick (1985) considered the differences between them more ostensible than real. This notion was shared by Reichers and Schneider (1990), who considered culture as merely a replacement for climate.

On the other hand, the distinction between the two concepts was clear in Ekvall’s (1983) work, which considered the concepts as different components of the social system

within organisations. He referred to shared beliefs and values as culture, and behavioural aspects as climate. Schein (1992, p. 230) classifies the relationship between culture and climate by describing climate as “a reflection and manifestation of cultural assumptions”. Guldenmund (2000) concludes in his review that when the term *culture* succeeded *climate*, this resulted in climate being limited to the measurement and description of attitudes within an organisation. Both organisational culture and climate can be discussed within this conceptualisation.

Campbell, Dunnette, Lawler and Wick (1970, p. 390) define organisational climate as “a set of attributes specific to a particular organization that may be induced from the way the organization deals with its members and its environment”. Organisational climate has been described as the common patterns or shared perceptions of an organisation’s members in terms of their institution and their roles in that organisation (Peterson & White, 1992; Reichers & Schneider, 1990). It differs from organisational culture in that it is concerned with individuals’ attitudes and perceptions of certain aspects of the organisational environment, whereas culture is based on organisation-wide shared beliefs (Reichers & Schneider, 1990). Schein (2010, p. 18) defines organisational culture as

A pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.

Scott (1987) considers that organisational culture consists of external variables (e.g., the external environment hosting the organisation) and internal variables representing the value and style of an organisation. This assumption is in line with the findings of Hofstede’s seminal work in the late 1960s and early 1970s. Hofstede (1983) studied 100,000 IBM employees in different geographical settings and found that, despite working

for the same company, organisational cultures differed based on their geographical locations and the hosting cultures leading him to define culture as presented earlier.

Organisational culture has its roots in anthropological studies: knowing this helps to define its characteristics. Guldenmund (2000, p. 225) describes the characteristics of organisational culture as a “relatively stable, multidimensional, holistic construct shared by (groups of) organisational members that supplies a frame of reference and which gives meaning to and/or is typically revealed in certain practices”. Based on the assumption that the organisational climate is an organisational culture under formation (Schein, 1992), it is anticipated that climate is less stable than culture, having fewer dimensionalities and being more specific to certain aspects of a given organisation. When an organisational climate is not deeply rooted in the beliefs of an organisation, less resistance to change is expected (Denison, 1996); thus, it is in the best interests of management to intervene and manipulate organisational climate which, if maintained over a period of time, should result in a more desirable organisational culture with the required stability. This assumption has been evident in the approaches traditionally used to investigate both concepts.

Despite the concepts of organisational culture and climate both emerging from the social sciences, they have different theoretical origins. It has been argued that organisational culture research is interested in the evolution of the social system within an organisation while organisational climate research is more concerned with the effect of the organisational system on individuals and groups (Denison, 1996). Organisational culture has conventionally been investigated subjectively, using a qualitative paradigm; organisational climate, on the other hand, has been investigated objectively within a quantitative paradigm (Denison, 1996; Guldenmund, 2000; Reichers & Schneider, 1990). It is not uncommon for research on organisational culture to be rich in descriptions, unlike the comparative research of organisational climate (Denison, 1996; Reichers & Schneider,

1990). However, given the overlap of these concepts, a less strict application of traditional paradigms is evident in the literature (Frazier et al., 2013).

Safety culture and safety climate are clearly derivatives of organisational culture and climate, which can be greatly influenced by the national culture, which is considered as part (or a type) of anthropological culture. In other words, national culture may have an influence on safety culture and climate either directly or indirectly. This is of particular interest in the current study as it tries to understand and assess safety culture and climate in health organisations located within Saudi culture, using specific methodological approaches to investigate patient safety culture and climate.

2.8. Patient safety culture and climate

The concepts of safety culture and climate were adopted in health care organisations after they had been linked to safer environments and work practice in fields such as nuclear plants and aviation (Halligan & Zecevic, 2011). Despite the concept of modern patient safety tracing back to 1991 (Leape, 2008), the relevance of safety culture and climate to patient safety was only widely adopted after the IOM's report was published in 1999 (Flin, Burns, Mearns, Yule, & Robertson, 2006; Halligan & Zecevic, 2011; Jackson, Sarac, & Flin, 2010). As a result, the concepts of patient safety culture and climate can be looked at as the descendants of safety culture and climate in other fields. They are applicable to health care settings, where safety climate takes on a more specific definition as “the consensus of shared perceptions regarding patient safety norms and behaviors by frontline workers in a given clinical area” (Sexton et al., 2011, p. 934). Different approaches using different tools are used to investigate patient safety culture and climate.

Pumar-Méndez, Attree and Wakefield (2014) conducted an extensive review of studies that assessed patient safety in health organisations, focusing on methodological

aspects of safety culture assessment. Despite researchers' recommendations and suggestions to use a mixed methods approach to study safety culture (Glendon & Stanton, 2000; Guldenmund, 2000; Nieva & Sorra, 2003; Pumar-méndez et al., 2014; Reiman & Oedewald, 2002; Scott, Mannion, Davies, & Marshall, 2003), almost all the reviewed research followed the quantitative approach using cross-sectional surveys (Pumar-méndez et al., 2014). Only one used a mixed methods approach (Cook, Hoas, Guttmanova, & Joyner, 2004) and one used an ethnographic approach (Waring, 2007).

Several explanations for the domination of the quantitative approach (e.g., cross-sectional surveys) in the safety culture and climate research have been proposed (Clarke, 2000; Colla et al., 2005; Nieva & Sorra, 2003; Reiman & Oedewald, 2002). First, surveys can be useful in collecting shared beliefs, values and norms about different safety issues from a large number of employees, relatively quickly and in an economical fashion. Second, surveys produce numerical results that can be aggregated to any desired level to summarise the safety climate at that level. Third, the numerical results can be used to assess changes in safety climate over time or compare the results with similar organisations. Despite these benefits, researchers have expressed doubts about using only a quantitative approach to assess safety culture (Cooper, 2000; Guldenmund, 2000; Hopkins, 2006; Marshall, Parker, Esmail, Kirk, & Claridge, 2003; Nieva & Sorra, 2003; Reiman & Oedewald, 2002; Schein, 2010; Scott et al., 2003). Their main concern is the ability of the quantitative approach to reveal the core aspect of any given culture, including safety culture. However, safety climate (as the measurable component of safety culture) has traditionally been studied this way through cross-sectional surveys (Flin et al., 2000; Guldenmund, 2000; Halligan & Zecevic, 2011).

2.9. Patient safety climate as a measurement of patient safety culture

Improving patient safety in any given health care organisation requires a thorough understanding of safety culture and climate. Different methods and tools have been used to assess patient safety in an effort to find ways for improvement. The use of safety culture tools to assess patient safety can be beneficial in several aspects. Nieva and Sorra (2003) summarise the importance of studying safety culture and climate in health care organisations by specifying four aims: 1) diagnostic reasons for identifying areas of improvement; 2) both internal and external benchmarking; 3) evaluation of safety interventions and tracking of changes; or 4) simple adherence to authorities' regulations. These four aims, despite not being exclusive, map the importance of patient safety investigations. Health care organisations regularly assess safety culture and climate, whether initiated from within or as required by regulatory authorities, to identify areas for possible improvement and interventions as required. These interventions are usually aimed at transforming the culture, behaviour or system, among other components. Once areas for improvement are identified, interventions can be designed and conducted to improve patient safety.

2.10. Review of surveys

The most common method of collecting safety climate data is through questionnaires (Guldenmund, 2000; Halligan & Zecevic, 2011). Questionnaires can provide a systematic way of collecting a large amount of data simultaneously in a practical way (De Vaus, 2001), enabling investigators to identify consensus in respondents' perceptions (Sexton et al., 2006a). A large number of different safety dimensions have been tested by several different questionnaires. As the study of safety climate is in its infancy, consistency in determining most relevant dimensions has yet to be achieved (Halligan & Zecevic, 2011; Singla, Kitch, Weissman, & Campbell, 2006). Depending on

the tool used, the unit/department and the type of investigation, the dimensions can change (Jackson et al., 2010). The reviews indicate that a large number of overlapping dimensions exist in the literature, making it difficult to categorise them into safety themes (Colla et al., 2005; Fleming, 2005; Flin et al., 2006; Halligan & Zecevic, 2011; Jackson et al., 2010; Kirk, Parker, Claridge, Esmail, & Marshall, 2007; Sexton et al., 2006a; Singla et al., 2006).

Singla and colleagues in 2006 identified 23 different dimensions in their extensive review of the safety climate surveys available. Based on consultation with patient safety experts, they reclassified them into 13 dimensions: management and supervision; safety system; risk; work pressure; competence; procedures and rules; teamwork; communication; organisational learning; feedback and communication; beliefs about the cause of errors and adverse events; job satisfaction; and overall perception of safety. Two years later Fleming and Wentzell (2008) conducted a review of patient safety surveys and reduced the dimensions to six fundamental dimensions: leadership, safety systems, job demands, organisational reporting, teamwork and communication.

Consistency in the safety climate dimensions has yet to be achieved, yet common dimensions are recurrent in the literature. The following list identifies combined dimensions extracted from four different reviews:

- 1- Top management's/supervisors' commitment to safety
- 2- Safety system, including evidence-based policy and procedures
- 3- Teamwork
- 4- Communication openness within and across teams/units/departments
- 5- Analysis and feedback about adverse events following a non-punitive approach
- 6- Continuous training and education, including organisational learning
- 7- Job demand, stress recognition and staff satisfaction
- 8- Safety perception and attitude (Colla et al., 2005; Flin et al., 2006; Halligan & Zecevic, 2011; Jackson et al., 2010).

This list is not inclusive. Endless lists of dimensions exist and will continue to be identified as new developments arise in research on safety climate. Nevertheless, given that safety culture is influenced by organisational culture (Guldenmund, 2000) and the latter is influenced by the national culture (Hofstede, 1983), studies investigating the influence of national culture on safety culture were not located through the literature search. Similarly, there is a lack of research evidence on the influence of multiculturalism on health care teams in regards to safety; although the influence of cultural differences between health care professionals and their patients (who are usually from minority cultural backgrounds) on patient safety is evident (Johnstone & Kanitsaki, 2006, 2008; Renzaho, Romios, Crock, & Sønderslund, 2013; Suurmond, Uiters, de Bruijne, Stronks, & Essink-Bot, 2010).

Various tools claiming to measure safety climate are abundant in the literature. Several safety climate instruments measure different dimensions of patient safety in health care organisations. Reviews of patient safety and safety climate instruments have also been conducted on a regular basis (Colla et al., 2005; Cooper, 2000; Flin et al., 2006; Flin et al., 2000; Guldenmund, 2000, 2007, 2010; Halligan & Zecevic, 2011; Jackson et al., 2010; Jha, Prasopa-Plaizier, Larizgoitia, & Bates, 2010; Pumar-méndez et al., 2014). Given this plethora of instruments, researchers have recommended the use of only psychometrically tested and valid tools (Colla et al., 2005; Flin, 2007; Guldenmund, 2010; Nieva & Sorra, 2003; Singla et al., 2006). These reviews provide comparative analyses of the available instruments, and helped in the choice of the instrument for the current study. The reviews were also used as a starting point to indicate the available instruments. Findings from these reviews were compared to identify similarities and differences, and a manual bibliographic search was conducted to retrieve all available instruments. The findings of the reviews were then cross-checked with the findings of the manual search. This was done to build on the work achieved in the field in a critical way.

The focus of the review was to find instruments that have been 1) subjected to psychometric and validity testing; 2) used in different contexts and cultures as this study is conducted in a different culture than the Western where most of the research conducted; and 3) used or could be used in operating theatres' settings. Psychometrically sound and valid tools help reflect safety culture more accurately than other tools (Flin, 2007; Guldenmund, 2010). In addition, it was assumed that tools that had been tested in different contexts would be more suitable for this study's contexts. Finally, tools that specifically addressed issues in operating theatres were generally more preferable.

Several reviews addressed patient safety climate instruments as their main aim or as part of their review of patient safety in general (Colla et al., 2005; Fleming, 2005; Flin et al., 2006; Halligan & Zecevic, 2011; Jackson et al., 2010; Pumar-Méndez et al., 2014; Singla et al., 2006). These provided a strong indication of the plethora of instruments measuring patient safety climate, as there was hardly any duplication of the instruments on which they reported. The lack of consensus on the core aspects of safety culture has led researchers to develop different tools that vary in their focus, length and structure (Flin et al., 2000; Guldenmund, 2000; Singla et al., 2006). The available instruments included a diverse range of items (from nine to 99) and dimensions (from one to 12) (Pumar-Méndez et al., 2014). Most instruments appearing in each review, depending on the review's focus, were used in a single study with no reporting of any psychometric properties (Table 2.1).

Fleming (2005) emphasises the superiority of three instruments: 1) the Safety Attitude Questionnaire (SAQ), 2) the Hospital Survey on Patient Safety Culture (HSOPSC) and 3) the Modified Stanford Patient Safety Culture Survey Instrument (MSI). Meanwhile, Flin and colleagues (2006) indicate in their review that safety climate instruments are still in the early stage of development and validation. Five years later, Halligan and Zecevic (2011) indicate that the SAQ, HSOPSC and MSI along with the Patient Safety Culture in Health Organisations (PSCHO) survey are the most widely used instruments. Jackson and

colleagues (2010) found in their review that the SAQ, HSOPSC, PSCHO and the Hospital Safety Climate (HSC) survey are the most appropriate instruments and show acceptable psychometric properties. Similarly, in a review of safety climate measurements, the Health Foundation (United Kingdom - UK) (2011, p. 3) reports that the SAQ, HSOPSC, PSCHO, the Safety Climate Survey (SCS) and the Manchester Patient Safety Assessment Framework are “the most rigorously tested and well known tools”. European Union Network for Patient Safety (2010) recommend the use of the SAQ and HSOPSC or the qualitative tool, the Manchester Patient Safety Assessment Framework, in their report prepared for the European Society for Quality in Healthcare.

All these reviews consistently recommend the use of the SAQ or HSOPSC because of their psychometric properties, validity and applicability to safety climate research. Both the SAQ and HSOPSC were developed and tested to measure patient safety climate in health organisations. The HSOPSC consists of 12 dimensions (AHRQ, 2011) while the SAQ has only six (Sexton et al., 2006a). Both instruments address core aspects of safety including teamwork, communication and management support. The SAQ addresses human factors and job satisfaction along with core aspects of safety culture; the HSOPSC includes handoffs (delegation of responsibility to other professionals) and the supervisor’s role in promoting patient safety. Singla et al. (2006) indicate that these two instruments are similar in terms of strength and appropriateness, and suggest that the choice between them should be based on the desired dimensions of safety to be investigated and the targeted clinical place and participants.

The SAQ was developed for critical care areas and has a version specifically modified to investigate the safety climate in operating theatres (Sexton et al., 2006a). Pronovost and colleagues (2009, p. 176) claim that the SAQ is the “most thoroughly validated and widely used instrument to assess safety culture in health care”. The SAQ is

also sensitive in picking up differences at the unit level, which is the recommended level for patient safety investigation and improvement (Sexton et al., 2006a).

Table 2.1: Reviews of the survey instruments

Author	Included instruments	Concluding comments
Colla, 2005	9 instruments were compared based on set criteria (n=24) generally covering four areas: Instrument characteristics, dimensions covered, psychometric testing, and how it was used	Instruments varied on the last two sets of criteria: SAQ (n=23); HSOPS (n=18)
Fleming, 2005	Reviewed 4 instrument based on recommendation from Canadian Council on Health Services Accreditation by presenting description, weaknesses and strengths. SAQ, Stanford Instrument, HSOPSC, MSI	HSOPSC and SAQ had similar weaknesses and strengths, main strength was the benchmarking data; main weakness was the length.
Flin et al., 2006	12 instruments identified	Concluded that all reviewed instruments were at an early stage of development and needed more testing
Singla, 2006	13 instruments identified	Commonalities and differences were identified; HSOPS and SAQ advantaged from benchmarking data and psychometric properties.
Halligan and Zecieve 2011	12 instruments identified; the review focus was concerned with patient safety in general	The most widely used were SAQ, HSOPSC, PSCHO and MSI
Jackson et al., 2010	Aimed to review SAQ, HSOPS, PSCHO and HSC as the widely used instruments	Most used one of the four: SAQ & HSOPSC Both studies proven good at unit level - PSCHO – proven good at hospital level HSC – used for workplace exposure injuries
EUNPS, 2010	19 instruments were reviewed to make recommendation for use in European Union.	Recommended the use of SAQ HSOPS Manchester patient safety assessment framework

2.11. Safety Attitudes Questionnaire (SAQ) development

The current version of the SAQ has been through different stages of development and refinement. The Flight Management Attitudes Questionnaire (FMAQ) was the original instrument used to develop the Intensive Care Unit Management Attitudes Questionnaire which, in turn, was used to develop the SAQ (Sexton et al., 2006a). The FMAQ was developed to measure the attitudes of flight crew members about such things as teamwork, speaking up and communication, which were found to contribute to most accidents in aviation (Helmreich, Merritt, Sherman, Gregorich, & Wiener, 1993). Twenty-five per cent of FMAQ items, applicable in medical settings, were retained in the SAQ (Sexton et al., 2006a). The other SAQ items were developed based on discussions and the focus group approach with health care providers and experts in the field of patient safety (Sexton et al., 2006a).

Most safety climate instruments are criticised for lacking theoretical underpinning in their development or application (Flin et al., 2000; Flin, 2007; Guldenmund, 2000, 2007). Sexton and colleagues (2006a) indicate that the SAQ is based on two conceptual models: Vincent, Taylor-Adams and Stanhope's (1998) framework for analysing risk and safety, and Donabedian's (1988) conceptual model for assessing quality.

This process of development was also supported using an appropriate validation process. The SAQ was piloted and tested in different settings such as intensive care units, operating theatres, general inpatient settings like medical or surgical wards and ambulatory units (a total of 203 units) in the USA, the UK and New Zealand (Sexton et al., 2006a). The SAQ was subsequently subjected to rigorous psychometric testing that resulted in the current version, used in this study. Benchmarking data were made available for future usage and comparisons. A multilevel factor analysis yielded 30 items measuring six dimensions with high reliability (Raykov's $\rho = 0.90$) (Sexton et al., 2006a) and measuring participants' agreement with the 30 statements on a 5-point Likert scale (1 =

strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree). Higher scores are considered to be indicative of the presence of a positive safety climate, associated with positive patient and staff outcomes (Health Foundation, 2011; Sexton et al., 2006a). SAQ has been recommended to be used to measure the effectiveness of safety improvement activities (Watts, Percarpio, West, & Mills, 2010)

The Health Foundation's (2011) review indicates that the SAQ is unique in having been used for more than 20 years in different industries. The review indicates that the SAQ is suitable for comparing attitudes between different professions where it has been validated for this purpose. Sexton and colleagues (2006a) tested factorability and determined that the SAQ is valuable in detecting differences within and across organisations. The SAQ has been used in different settings (Pronovost et al., 2009) and has been translated into different languages including Turkish (Kaya, Barsbay, & Karabulut, 2010), Swedish (Nordén-Hägg, Sexton, Kälvemark-Sporrong, Ring, & Kettis-Lindblad, 2010), Dutch (Devriendt et al., 2012), Chinese (Lee et al., 2010), Norwegian (Deilkås & Hofoss, 2008) and German (Zimmermann et al., 2013). Two Arabic translations were located at a later stage of this study (Abdou & Saber, 2011; Hamdan, 2013).

The SAQ's measured dimensions are teamwork climate, safety climate, job satisfaction, perception of management, stress recognition and working conditions. These are discussed in detail in the following sub-sections.

2.11.1. Teamwork climate

The teamwork climate dimension is concerned with the quality of collaboration and communication between health care professionals within a clinical area (Sexton et al., 2006b; Thomas, Sexton, & Helmreich, 2004). Familiarity and trust between team members, their experience and professional beliefs, their perception of collaboration with other team members, and their role and job within an organisation are among the most

influential factors on the quality of the teamwork climate (Sexton et al., 2006b; Zwarenstein & Bryant, 2000). A positive teamwork climate is indicative of strong cohesion within the team, characterised by an environment that values and welcomes members' contributions with a high level of familiarity between team members that can lead to better prediction of colleagues' responses in emergencies (Sexton et al., 2006a). As poor teamwork has been associated with an increase in adverse events (Barraclough & Birch, 2006), improving teamwork is advocated as an important factor in improving patient safety (Hindle, Braithwaite, Travaglia, & Iedema, 2006; Leigh, Long, & Barraclough, 2004; Sexton et al., 2006b). Sexton and colleagues (2006b) argue that understanding the perceptions and attitudes of team members about the state of teamwork within a clinical place can be considered an initial step to improving the teamwork climate.

Serious adverse events in operating theatres have been linked to teamwork and communication breakdown (Edmonds, Liguori, & Stanton, 2005; Gawande et al., 2003). Effective teamwork is one of five strategies recommended for safer health systems in the IOM report (Kohn et al., 2000), and positive teamwork in operating theatres has been shown to be an integral part of a positive safety culture (Saufl, 2002, 2004), associated with a lower error-reduction rate in aviation (Helmreich, Foushee, Benson, & Russini, 1986) and health settings (Baggs et al., 1999; Shortell et al., 1994). It has also been associated with lower nurse turnover in operating theatres (Makary et al., 2006). Positive teamwork is associated with less dissatisfaction and less sick leave being taken by health care professionals (Kivimäki et al., 2001). A lack of positive teamwork has been found to be one of the important sources of nurses' dissatisfaction with their profession (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002), leading to nursing turnover and shortages and an increase in patient mortality (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Bednash, 2000).

2.11.2. Safety climate

The safety climate dimension is used as an indication of the presence of a proactive commitment to patient safety by investigating the processes of adverse events reporting behaviour and management (Sexton et al., 2006). A proactive commitment towards patient safety has been argued as an essential part of positive safety culture (Barraclough, 2004; McFerran, Nunes, Pucci, & Zuniga, 2005; Pronovost & Sexton, 2005). The proactive commitment presents itself in the actions taken by leaders and managers in response to adverse events, especially by encouraging reporting, providing feedback to employees and implementing a non-punitive system (DeJoy, 2005; Frazier et al., 2013).

2.11.3. Job satisfaction

The job satisfaction dimension relates to issues affecting staff morale, contentment with work and autonomy in work practice (Sexton et al., 2006a). Job satisfaction, in terms of a longer turnover time, helps to maintain an adequate level of staffing and creates an attractive environment that has been associated with a positive safety culture (Aiken et al., 2008; Aiken et al., 2002; Duffield, 2007; Sexton et al., 2006a). Lack of job satisfaction leads to emotional exhaustion, or burnout (Maslach & Leiter, 2008) and is an indication of a safety culture that needs improvement.

2.11.4. Perception of management

The perception of management dimension investigates the workers' perceptions of leadership and management in their workplace, as represented by clinician managers. The clinician manager's role has been shown to be essential in the development of patient safety strategies (Harris, Treanor, & Salisbury, 2006). A critical aspect of their role involves maintaining a safe system in health care delivery for both health care workers and their patients (Braithwaite et al., 2004; Ireri, Walshe, Benson, & Mwanthi, 2011). It has been argued that the safe delivery of health care is dependent on management's decisions

on the level of staffing and the availability of required equipment (Nunes & McFerran, 2005; Sexton et al., 2006a). A positive perception of management is indicated by the prioritisation of safety and quality over other organisational and managerial aspects (Duffield, Roche, O'Brien-Pallas, Catling-Paull, & King, 2009).

2.11.5. Stress recognition

The stress recognition dimension investigates the extent to which health care workers recognise the effect of stress impairment on their work and judgement in the workplace. It includes both stress and fatigue, which are usually a result of extended working hours (Dorrian et al., 2006). Long working hours, and related fatigue, have been associated with an increase in medical errors (Landrigan et al., 2004; Williamson et al., 2011). Working long hours has been shown to be ingrained in health care organisations' culture, with a lack of recognition of its effect on workers as reported by the Australian Council for Safety and Quality in Health Care (ACSQHC) (ACSQHC, 2005)). The effect of stress and fatigue has been recognised by organisations in aviation, leading to a reduction in and capping of working hours (Sexton, Thomas, & Helmreich, 2000).

2.11.6. Working conditions

The working conditions dimension is measured by four items relating to issues of the working environment: training, supervision, policy and procedures (Sexton et al., 2006a). Working conditions are considered an important component of the health care system (Hickam et al., 2003; Taylor et al., 2011) and have been associated directly with patient outcomes (IOM, 2001). They have also been associated with staff shortages (Stone et al., 2007), which in turn have been associated with patients' probability of survival (Aiken et al., 2002). Higher scores on working conditions are indicative of the presence of a positive working environment.

2.11.7. Communication and collaboration ratings

A breakdown in communication has been found to be a leading cause of wrong-site surgeries, among other adverse events (Lingard et al., 2004a; Nagpal et al., 2010; Rabøl et al., 2011). Communication is considered an integral part of safety culture (Blake, Kohler, Rask, Davis, & Naylor, 2006; Farrell & Davies, 2006; Gillespie, Chaboyer, & Murray, 2010; Gillespie, Gwinner, Chaboyer, & Fairweather, 2013; Hansen, Williams, & Singer, 2011; Hansen et al., 2003; Sammer, Lykens, Singh, Mains, & Lackan, 2010). Makary and colleagues (2006) found differences in how health care professionals view the quality of communication with colleagues from the same profession and with colleagues from other professions. They found that surgeons rate communication with fellow surgeons as high or very high 85% of the time. On the other hand, nurses rate the quality of communication and collaboration with surgeons as high or very high only 48% of the time (Makary et al., 2006). Communication is an important aspect of patient safety, especially in operating theatres where professionals from different disciplines work together at the same time on the same patient.

2.12. Patient safety in Saudi Arabia

Studies investigating patient safety in Saudi Arabia are diverse in their aims, the tools used, the dimensions measured, and the findings. Studies have attempted to develop new tools (Al-Saleh & Ramadan, 2011; Walston et al., 2010) as well as using validated tools such as the HSOPSC (Aboshaiqah & Baker, 2013; Al-Ahmadi, 2009; Alahmadi, 2010), different versions of the SCS (Almutairi, Gardner, & McCarthy, 2013; Taher et al., 2014) and different versions of the SAQ (Alayed, Lööf, & Johansson, 2014; Zakari, 2011). These tools measure different dimensions and so produce different results, but there are also results in common although based on different research aims.

Al-Saleh and Ramadan (2011) developed and tested a tool in 16 Saudi hospitals to examine agreement between frontline employees and managers regarding the impact of

human factor interventions on patient safety. They conclude that their tool is valid; however, it has not been used since. They found diverse assumptions between frontline employees and managers in terms of the level of training and education, reaction to errors and level of employees' participation in decision making (Al-Saleh & Ramadan, 2011). These differences between management and employees may be seen as an indication of the distance between the two groups. Managers thought that they provided enough support but employees sought more.

Management support is a recurrent issue in the literature on patient safety in Saudi Arabia. Walston and colleagues (2010) found that management support along with adequate resources and proper reporting systems are the main influencers of patient safety. These findings came from the use of a self-developed tool tested in four Saudi hospitals. They found in their sample that Saudi public hospitals perform better than private hospitals on the investigated measures (Walston et al., 2010). This contradicts Al-Ahmadi's (2009) findings of better overall patient safety grades in private hospitals (72.7% rated good or excellent) compared to public hospitals (58.2%). One explanation for this is the differences in measurement: Walston and colleagues (2010) used their own tool whereas Al-Ahmadi (2009) drew his results from the ratings of overall patient safety question on the HSOPSC, and reported that management role, communication and feedback about errors, organisational learning and teamwork were the main contributors to the overall patient safety score (Alahmadi, 2010).

Al-Ahmadi (2009) and Alahmadi (2010) conducted a study measuring attitudes towards patient safety in 13 public and private hospitals in Riyadh. Organisational learning, teamwork within units, and feedback and communication about errors were areas of strength in the hospitals (Alahmadi, 2010). Non-punitive responses to errors, staffing and teamwork across hospital units were areas with potential for improvement (Alahmadi, 2010). Similar results were reported by Aboshaiqah and Baker (2013) in a study using the

HSOPSC that sought to identify the factors perceived by nurses as contributing to patient safety culture in one tertiary hospital in Riyadh. They found only two areas of strength, organisational learning and management support; yet it is not clear if they were considered to be factors contributing to patient safety culture (Aboshaiqah & Baker, 2013). Both studies viewed null responses to reported errors in the past year as indication of a strong under-reporting culture; this could be argued otherwise (Aboshaiqah & Baker, 2013; Alahmadi, 2010). The existence of an under-reporting culture cannot be assumed solely on the basis of self-reported, retrospective data. Both studies conceptually mixed patient safety culture and under-reporting behaviour, assuming that each exists with the other.

Almutairi et al. (2013) used the SCS (21 items) to collect data from nurses in one tertiary hospital in Saudi Arabia. They concluded that nurses perceived the safety climate in their hospital as “unsafe” (Almutairi et al., 2013, p. 187). In addition, they found significant differences in the perception of safety climate based on respondents’ nationalities, despite reporting having no information on more than half of the participants’ nationalities (n = 171, 53%). The SCS (17 items) was used by another study to compare the perceptions of safety climate among nurses and physicians in different dialysis units, with the study finding no significant differences (Taher et al., 2014).

Two studies investigated nurses’ attitudes towards safety culture using different versions of the SAQ. Alayed et al. (2014) used the intensive care unit (ICU) version in six ICUs while Zakari (2011) used the ambulatory version in four ambulatory units. In both studies, participants displayed the most positive attitudes towards job satisfaction and the lowest positive attitude towards the perception of management. Zakari (2011) finds significant differences between staff nurses and nurse managers in all dimensions. Alayed and colleagues (2014) concluded that all dimensions, including job satisfaction, need improvement. Their respondents’ top recommendations for improving patient safety

include increased staffing levels and competence, better equipment, proper application of guidelines, better teamwork and communication, and more managerial support.

2.13. Summary

Safety culture is an important aspect of patient safety. There are well validated tools that can be used to measure safety culture but it is recommended that mixed methods are used to fully understand its complexity in a wider cultural context, embracing both organisational and national contexts. Reviewed studies indicate the strengths and weakness of different methods for investigating patient safety; the study design, methodology and methods were subsequently derived from this review and are discussed in later sections.

Chapter 3: Methodology

A mixed methods approach was chosen as the most appropriate approach to explore a complex topic. Survey and semi-structured interviews were collected and analysed sequentially, and findings from them were integrated to provide a holistic picture of the current safety culture in operating theatres in Saudi Arabia.

3.1. Mixed methods approach

Quantitative research was the dominant methodology in the first half of the 20th century (Johnson, Onwuegbuzie, & Turner, 2007). By the second half of the century, some researchers started to consider whether social sciences might be better addressed through a qualitative approach. Advocates of quantitative and qualitative research engaged in a dispute called the paradigm war. Purists who believed in paradigm singularity emerged on both sides; there were also those who advocated combining the approaches.

As the dispute evolved, researchers emerged who believed that each paradigm, with its inherited methods, had strengths but also had weaknesses, and that the two should be used in tandem and complement each other (Brewer & Hunter, 1989; Campbell & Fiske, 1959; Cook & Reichardt, 1979; Sieber, 1973). In 1959 Campbell and Fiske introduced the idea of triangulation, calling it “multiple operationalism”. They promoted the use of different methods to answer the same question as a way of validating results. This combination was also promoted in Sieber’s (1973) work, which argued for the use of fieldwork and surveys in the same study. In 1979 Cook and Reichardt published a book proposing different ways of combining quantitative and qualitative data. An entire issue of the *American Behavioral Scientist* was devoted to mixed methods research (Rossman & Wilson, 1985). In the 1980s mixed methods research was recognised as a distinct approach

linked to the pragmatic paradigm (Greene, Caracelli, & Graham, 1989; Morse, 1991; Rossman & Wilson, 1985).

The call to mix methods and paradigms from the opposing quantitative and qualitative approaches divided researchers on the question of how knowledge is derived from the world. Rossman and Wilson (1985) published a classification of researchers' perspectives about mixed methods research on a continuum of three: purists, situationalists and pragmatists. At one end are the purists, who believe that quantitative and qualitative paradigms derive from fundamentally and totally different epistemological and ontological assumptions and thus cannot be mixed (Guba, 1990; Lincoln & Guba, 1985; Smith, 1983; Smith & Heshusius, 1986). Purists argue that the different paradigms' embedded assumptions about the nature of knowledge and what is important to know are incompatible: this is termed the 'incompatibility thesis'. Purists believe in the dichotomy of research paradigms. Situationalists occupy the middle ground. While they maintain the purists' perspective of paradigm integrity, they allow the use of different paradigms in a single study, driven by specific situations or phases of the research (Kidder & Fine, 1987; Rossman & Wilson, 1985). Situationalists claim that each question or research phase should be addressed by one or the other method. Despite their advocacy of the use of different methods within a single study, they do not support integration. Pragmatists believe that methods are independent of research paradigms and argue for integrating them to best answer particular research questions (Cook & Reichardt, 1979; Johnson & Onwuegbuzie, 2004; Miles & Huberman, 1994; Teddlie & Tashakkori, 2009). They support the use and integration of different methods to address an issue or question.

Since the late 1980s a new movement promoting mixed methods research has developed alongside quantitative and qualitative approaches, and variously described as the third path (Gorard & Taylor, 2004); the third research paradigm (Johnson & Onwuegbuzie, 2004); and the third methodological movement (Tashakkori & Teddlie,

2003). Recently, with a growing number of researchers using mixed methods research, it has been referred to as the third research community (Teddlie & Tashakkori, 2009).

Johnson, Onwuegbuzie and Turner (2007) promote the view that even though mixed methods research is not a new practice, its approach is a new movement and a developing paradigm (p. 113). As this new movement has grown, the literature has expanded, offering different definitions, designs and elements that constitute the approach and to try to reach consensus among researchers. In their effort to come up with a comprehensive definition of mixed methods research, Johnson and colleagues (2007) identified 36 leading researchers in mixed methods and asked them to define it. Nineteen responses proved that definitions were diverse in terms of what is mixed (e.g., paradigms vs. methods); at what stage of a design mixing is carried out (e.g., the analysis stage vs. the interpretation stage); and the purpose and orientation of mixing (e.g., confirmation vs. exploration). Johnson and colleagues argue that such differences are healthy and should be embraced: as well as differences, they also note significant areas of homogeneity. For example, there was agreement that mixed methods research incorporates both qualitative and quantitative data and is undertaken for the breadth and depth of understanding of any given research problem. The great benefit of their study is that it sheds light on leading researchers' understanding and practice. It also indicates the great flexibility of mixed methods research. The most comprehensive definition found is that of Plano Clark and Creswell, that:

Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in

combination provides a better understanding of research problems than either approach alone. (2007, p. 5)

This definition emphasises the enhanced understanding of research problems the use of mixed methods research offers. In this current study a mixed methods approach has been chosen to answer the research questions as it is considered most suitable for a topic as complex as patient safety research (Battles & Lilford, 2003; Brown et al., 2008; Guldenmund, 2007; Halligan & Zecevic, 2011; Morgan, 2007; Runciman et al., 2008).

3.1.1. Pragmatism and mixed methods research

Creswell (2003, p. 6) indicates that knowledge claims are the assumptions that researchers have about “how, and what, they will learn”. Researchers ideally end at a different level of understanding than where they began (Morse & Niehaus, 2009). Stating a knowledge claim makes it easier to follow the discovery of new knowledge and to validate (Plano Clark & Creswell, 2011) the findings. This transition in knowledge is usually guided by epistemological assumptions about what counts as knowledge; and by ontology, relating to the nature of knowledge and reality. Post-positivism and constructivism are popular examples of philosophical worldviews, generally associated with quantitative and qualitative approaches respectively. Pragmatism is often considered the most common stance or position driving knowledge claims in mixed methods research (Creswell, 2003; Tashakkori & Teddlie, 2010, 2003; Teddlie & Tashakkori, 2009), claimed to be the “most useful philosophy to support mixed methods research” (Johnson et al., 2007, p. 121).

Pragmatism was formulated based on the work of late 19th and early 20th century American philosophers such as Charles Sanders Peirce (1839–1914), William James (1842–1910), George Mead (1863–1931) and John Dewey (1859–1952). Peirce was the founder of the pragmatism theory, which was developed and formulated in the work of James and later by Dewey (Rorty, 1982). Peirce, James’s and Dewey’s work led to the

notion that instead of letting one's understanding of an idea be driven by a philosophy or paradigm, ideas should be evaluated on their practical and empirical consequences (Johnson & Onwuegbuzie, 2004; Murphy, 1990). Unlike other paradigms or world views such as post-positivism, where the antecedents' assumptions drive the understanding of an issue, pragmatism focuses on the issue and its consequences to drive the inquiry (Creswell, 2014). Several writers have discussed the development of pragmatism and its use in mixed methods research (Cherryholmes, 1992; Creswell, 2003, 2014; Johnson & Onwuegbuzie, 2004; Murphy, 1990; Patton, 1990; Rorty, 1990; Tashakkori & Teddlie, 2010, 2003; Teddlie & Johnson, 2009; Teddlie & Tashakkori, 2009). Pragmatism as a philosophical assumption employed in mixed methods research is next discussed.

Pragmatism in mixed methods research evolves around the importance of the research questions and, in turn, drives the choice of method that best addresses the research problem rather than being restricted by the philosophical underpinning of either (Rossman & Wilson, 1985; Tashakkori & Teddlie, 2003). While pragmatists have been accused of falsifying the dichotomy of quantitative and qualitative approaches (Newman & Benz, 1998) and advocate integrating different methods within a single study (Creswell, 2003), Sieber (1973) argues that just as quantitative and qualitative approaches have strengths, they also have weaknesses that can be overcome by mixing them in a single study where they complement each other. Based on the work of Cherryholmes (1992), Creswell (2014), Johnson and Onwuegbuzie (2004), Morgan (2007), Patton (1990) and Rorty (1990), this research draws on three characteristics, keeping in mind the risk of over-simplifying the philosophy, to summarise the important assumptions of pragmatism and their application in mixed methods research.

First, pragmatism neither follows one philosophy nor attains any superiority of a single assumption. It rejects the duality of assumptions and seeks the middle ground to draw from the strengths of opposing assumptions, and allows them to complement each

other's weaknesses. It sanctions dualism even with opposing assumptions such as subjectivity and objectivity. As a result, researchers are free to choose what works to best answer their research questions.

Second, pragmatism assumes that subjective and objective assumptions are important aspects in understanding a certain phenomenon or problem. It recognises that social and political contexts, among others, shape experiences and beliefs and play an important role in research. Knowledge is constructed from the reality in which we live. Research should be driven by consequences and follow the formation of experience by testing what works and solves the problem, or at least answers the questions at hand.

Third, we are finding a provisional truth, not the ultimate one, and the world is not in unanimity. In fact, pragmatism assumes there are two worlds, one independent of the mind and one within the mind. Those two worlds should not be assumed to follow certain laws or reality. What we understand now may be different in the future.

Schools or positions within pragmatic philosophy have started to emerge (Teddlie & Tashakkori, 2012). For example, the dialectical position advocates the use of multiple paradigms within a single study (Greene, 2007). The transformative paradigm advocates the intertwining of research and politics to transform policies governing the studied issues (Mertens, 2010). It is too early to think of those positions as separate philosophies, and pragmatism is still widely respected as the philosophy driving mixed methods research (Teddlie & Tashakkori, 2012).

Mixed methods research employing pragmatic philosophical assumptions allows researchers to use what best addresses their concerns or research problems, whether from quantitative or qualitative assumptions, methods and procedures. With the great flexibility of mixed methods research comes great complexity in designing the study.

3.1.2. Patient safety and mixed methods research

Quantitative surveys have been the dominant research tool for investigating patient safety (Guldenmund, 2007; Halligan & Zecevic, 2011; Jackson et al., 2010). Other methods have been given lower weight compared to quantitative methods (Runciman et al., 2008). Several authors have argued for the need to combine both quantitative and qualitative methods and approaches to investigate patient safety (Battles & Lilford, 2003; Brown et al., 2008; Brown & Lilford, 2008; Guldenmund, 2007; Halligan & Zecevic, 2011; Jeffcott & Mackenzie, 2008; Runciman et al., 2008; Shekelle et al., 2011; Wahlström & Rollenhagen, 2009).

Halligan and Zecevic's (2011) review of 139 studies of safety culture in health care finds that only 14 use qualitative approaches. They conclude that surveys should be combined with qualitative methods such as interviews to provide more understanding of safety culture in health care. A similar recommendation is made by Runciman and colleagues (2008) in their commentary on the epistemology of patient safety. They argue the need for a pragmatic approach utilising quantitative and qualitative methods along with retrospective, real-time and prospective designs. Years before these recommendations, the use of mixed methods was strongly advocated by Battles and Lilford (2003), arguing that patient safety is a complex issue and single method research cannot identify risks and hazards. It was suggested that for more understanding of risks in patient safety, methods should be combined to complement each other.

The quality of methods and methodologies used in researching patient safety has concerned the Medical Research Council in the United Kingdom. They argue that patient safety research is a complex issue that benefits greatly from a pragmatic philosophy and a mixed methods approach (Brown et al., 2008). Mixed methods research is considered the best approach as it improves the ability to contextualise findings in complex settings such as patient safety (Brown & Lilford, 2008). Wahlström and Rollenhagen (2009) argue for a

connection between people's attitudes, beliefs and values and the culture of safety in an organisation. One of their recommendations is to use surveys for the identification of issues that can be later investigated in more depth, such as by using semi-structured interviews.

The current research problem and questions are best addressed by employing mixed methods research with a pragmatic philosophical approach, as advocated by Plano Clark and Creswell (2011), Rossman and Wilson (1985) and Tashakkori and Teddlie (2003), to unravel the complexity of patient safety culture in operating theatres, in a Saudi Arabian context.

3.2. Design

3.2.1. Mixed methods designs

As mixed methods research is initially the result of combining quantitative and qualitative approaches and methods, several combinations have been created and promoted by researchers. Books and articles have been published about different ways to combine quantitative and qualitative methods in a single study (Brewer & Hunter, 1989; Cook & Reichardt, 1979; Miles & Huberman, 1994; Morse, 1991; Rossman & Wilson, 1985). This plethora of designs has been recognised by several researchers who, in turn, have reviewed the way that researchers mix their methods (Caracelli & Greene, 1997; Greene et al., 1989; Morgan, 2007; Östlund, Kidd, Wengström, & Rowa-Dewar, 2011; Rossman & Wilson, 1985).

Greene et al.'s (1989) publication was the first to classify designs based on reviewing the employed designs of antecedents' mixed methods research. Based on their review of 57 empirical mixed methods research studies, they divided the designs into five categories based on the purpose of the approach. Those categories were: triangulation, complementarity, development, initiation and expansion (see Table 3.1)

Table 3.1: Five mixed methods designs

Design	Purpose	Rationale
Triangulation	Seeks convergence, corroboration, correspondence of results from the different methods.	To increase the validity of constructs and inquiry results by counteracting or maximising the heterogeneity of irrelevant sources of variance attributable especially to inherent method bias but also to inquirer bias, bias of substantive theory and biases of inquiry context.
Complementarity	Seeks elaboration, enhancement, illustration and clarification of the results from one method with the results from the other method.	To increase the interpretability, meaningfulness and validity of constructs and inquiry results by both capitalising on inherent method strengths and counteracting inherent biases in methods and other sources.
Development	Seeks to use the results from one method to help develop or inform the other method, where development is broadly construed to include sampling and implementation as well as measurement decisions.	To increase the validity of constructs and inquiry results by capitalising on inherent method strengths.
Initiation	Seeks the discovery of paradox and contradiction, new perspectives of frameworks and the recasting of questions or results from one method with questions or results from the other method.	To increase the breadth and depth of inquiry results and interpretations by analysing them from the perspectives of different methods and paradigms.
Expansion	Seeks to extend the breadth and range of inquiry by using different methods for different inquiry components.	To increase the scope of inquiry by selecting the methods most appropriate for multiple inquiry components.

Source: adapted from (Greene et al., 1989)

As mixed methods research has become more popular, different designs have emerged. Tashakkori and Teddlie (2003) indicate that more than 40 mixed methods designs are reported in the literature. Creswell, Plano Clark, Gutmann and Hanson (2003) identify the most popular six designs. Those fall into two groups, sequential and concurrent, based on the type and time of data collection and data integration. Those designs are then classified into two levels, basic mixed methods, and advanced or complex (Creswell, 2014). The complex designs are mainly combinations of the basic ones. The three basic designs, explained as the basic elements of research designs in mixed methods,

are convergent parallel mixed methods design, exploratory sequential mixed methods design and explanatory sequential mixed methods design (Figure 4).

The convergent parallel mixed methods design is the most familiar (Creswell, 2014). It uses different methods to confirm that the obtained results are of greater applicability to diverse populations. Different methods are used to complement each other: both quantitative and qualitative data about the same dimensions are collected at the same time and the results are compared and confirmed, which may reveal convergence or divergence in the results. Both results are integrated at the discussion phase of the study.

The exploratory sequential mixed methods design is most useful for developing better measurement by identifying the domains or factors that need to be measured (Creswell, 2014). It is more applicable for research in relatively new fields where important issues need to be identified. It starts with the collection and analysis of qualitative data, which influence the development of the quantitative data collection and analysis. While the results are mainly integrated at the interpretation phase, they also connect at the earlier stage as the results of the first study inform the data collection in the second phase.

In contrast to the exploratory sequential mixed methods design is *the explanatory sequential mixed methods design* which is considered the most straightforward of the mixed methods research designs (Creswell et al., 2003). It is characterised by the use of a quantitative data collection and analysis phase followed by an in-depth qualitative data collection and analysis phase; the latter is used to gain more understanding of the significant issues raised in the former. The strength of this design is that it provides an in-depth understanding of unexpected issues or significant differences that are raised from investigating the general population of the study. In a fashion similar to the exploratory sequential design, the results of the first study inform the second study and the main integration of the results takes place in the interpretation phase. This design has been

advocated as applicable to fields dominated by the quantitative approach and methods (Creswell, 2014) such as patient safety (Wahlström & Rollenhagen, 2009).

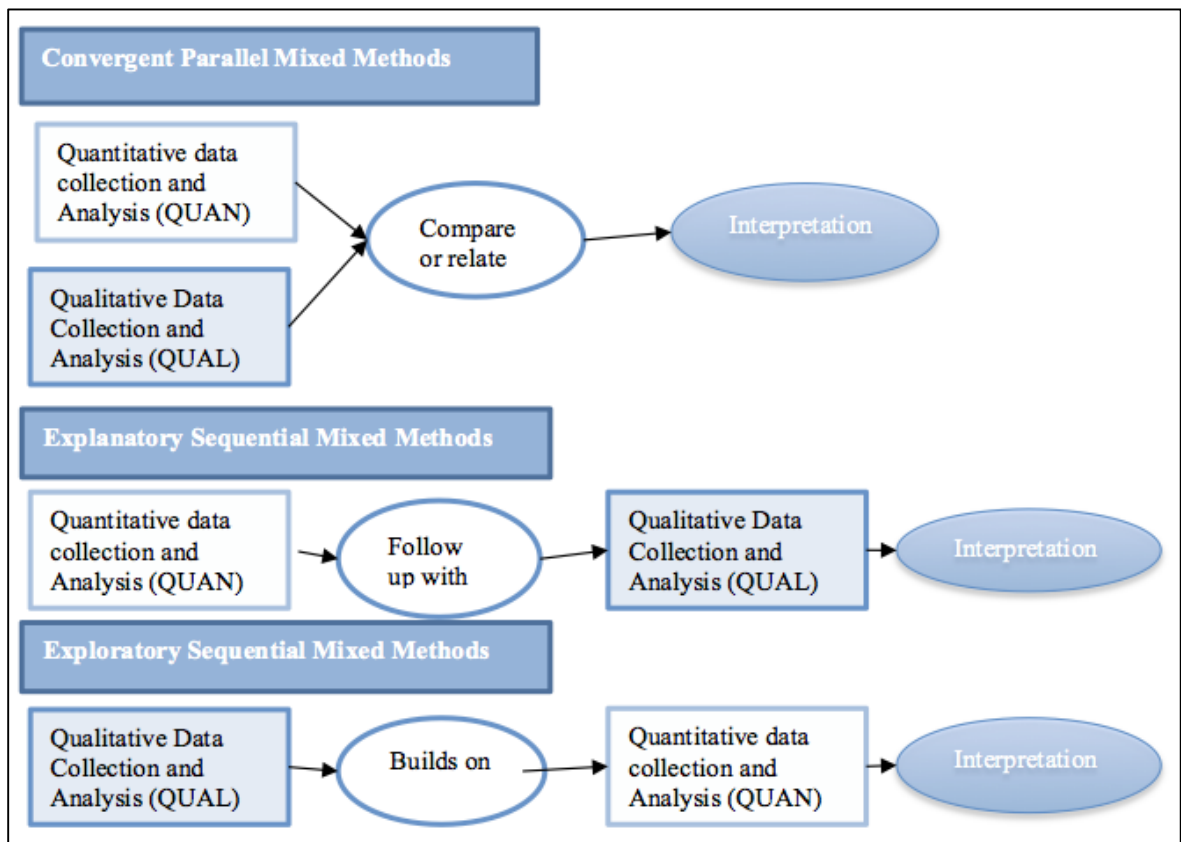


Figure 4: Three basic mixed methods designs (Creswell, 2014, p. 220)

3.2.2. Employed design

Following a pragmatic philosophy, the explanatory sequential mixed methods design was chosen as the best approach to investigate the research problem at hand. It was used to guide the process of collecting and analysing the data and present the results and findings. Plano Clark and Creswell (2011) argue that mixed methods research is challenging and designs should be used based on their specific advantages. The explanatory sequential mixed methods design was employed for this study because it is more applicable for fields dominated by quantitative research (Creswell, 2014). Patient safety research has been dominated by surveys (Battles & Lilford, 2003; Guldenmund, 2007; Halligan & Zecevic, 2011). This design builds on what others have achieved using

surveys and provides more understanding, through semi-structured interviews, of significant issues. In other words, it allows different methods to complement each other. It uses the survey to identify significant issues or certain groups from the general population of the study. It then uses the interviews to provide more understanding of those issues (Figure 5).

Plano Clark and Creswell (2011) identify four aspects of design in mixed methods research that need to be explicitly discussed: a) the level of interaction between quantitative and qualitative methods and results; b) the priority of the methods; c) the timing of the implementation; and d) the integration of the results.

3.2.2.1. Interaction

This aspect is concerned with the level of interaction between quantitative and qualitative data collection, analysis and results. Both studies may be totally separate from each other until the interpretation of the results, as in convergent, parallel mixed methods design, or they could have earlier interaction. For this study there were two stages at which interaction occurred: at the formation of the second study, as it was informed by the results of the first study; and at the stage of interpretation, where both sets of result were integrated. This was a consequence of the nature of the employed design where the second phase built on the first.

3.2.2.2. Priority

Priority relates to the emphasis or relative weighting given to the quantitative and qualitative components of the study. The priority could be equal or weighted towards one over the other. In this study, both quantitative and qualitative components have equal weighting and priority. They both took almost the same amount of time to plan, conduct and analyse. In addition, both contributed equally to the findings.

3.2.2.3. Timing

Timing is concerned with when various methods are employed within research. A decision had to be made about whether data were to be collected sequentially or concurrently. If collected sequentially, which method comes first? The study used sequential implementation, with the quantitative data collected and analysed in the first phase followed by the qualitative data being collected and analysed in the second phase.

3.2.2.4. Integration

This aspect refers to the synthesis or mixing of data, which might occur at any stage of the research: during data collection, analysis or at the interpretation of results. Both quantitative and qualitative data were collected and analysed separately in this study. Integration took place at the level of the interpretation of results. As has been noted, the results of the first phase informed the second phase's data collection; this is considered interaction rather than integration.

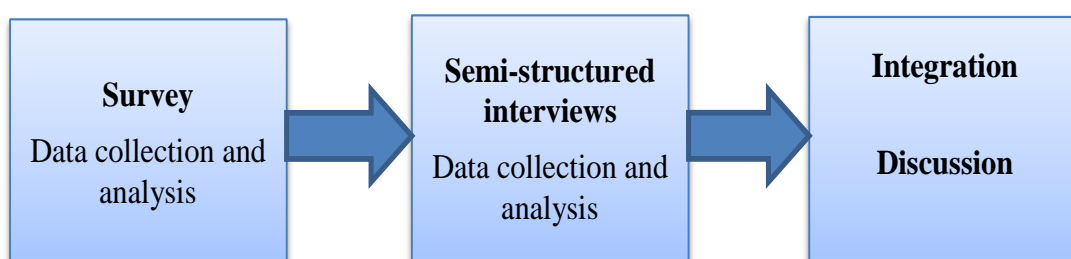


Figure 5: Sequence and weight of methods used in the current study employing explanatory sequential mixed methods design.

3.3. Summary

In this chapter, it is argued that mixed methods design, underpinned by pragmatism, is the most appropriate approach to explore complex topics such as safety culture. This study was designed to collect two sets of data, survey and interviews, in an effort to get a broad and deep understanding of safety culture in operating theatres in Saudi Arabia.

Chapter 4: Methods

This chapter presents the methods used for data collection and analysis for both phases of the study. It is divided into two sections: the first section introduces the quantitative method (survey) used for the first phase and the second section presents the qualitative method (interview) used for the second phase.

4.1. Quantitative method

4.1.1. Design

Phase I of this study used a cross-sectional survey to collect quantitative data from the participants through self-administered questionnaires. These are useful in descriptive or exploratory studies such as this one where the researchers are interested in participants' opinions of the safety climate in operating theatres (De Vaus, 2001; Nardi, 2003). A cross-sectional design involves the collection of data once at a certain point in time (Polit & Beck, 2004). Collecting a structured set of data is crucial in cross-sectional designs because it permits systematic comparison and aggregation of results (De Vaus, 2001). Using the same instrument to collect data from multiple cases is the basis of the analysis of cross-sectional designs.

4.1.2. Advantages and disadvantages of self-administered questionnaires

Even though data could be collected from methods such as face-to-face interviews and observations, there are advantages to using self-administered questionnaires. These gather the required information from a large number of participants in a cost-effective and timely manner (Gorard, 2003). They are easy to implement, especially in large studies (De Vaus, 2001) and Gorard (2003) claims, enhance the confidentiality and anonymity of respondents, while the absence of the researcher encourages truthful answers. Nardi (2003)

summarises four advantages of using self-administered questionnaires as follows: 1) measuring issues with numerous variables; 2) measuring variables that are not usually observable; 3) describing the characteristics of large populations; and 4) studying issues that are highly sensitive and difficult for participants to discuss openly.

Ambiguously worded questions or inconclusive results are of great concern in self-administered questionnaires (De Vaus, 2001). These can be avoided with careful design and testing of the questionnaire to be used (by pilot testing and expert consultations). A low response rate is the main drawback of self-administered questionnaires; however, well-designed questionnaires usually have almost the same response rate as other data collection methods (Dillman, 2000; Gorard, 2003). Given that the design of the questionnaires plays an important role in the response rate and the results' accuracy, it was carefully considered.

4.1.3. Tool development

The questionnaire that was used for collecting data from participants in Phase I was carefully designed to elicit answers the research questions and went through several stages of preparation. After deciding on the field of study and research questions, the patient safety climate was critically reviewed. Other questions that were expected to assist in answering some of the fundamental research questions were added. All questions were continuously revised. Permission to modify and use the SAQ was sought from one of the authors of the original climate, namely R. Helmreich (2011), and was granted via email. When agreement was reached on the final elements of the questionnaire, a rigorous process of translation was conducted. Subject, field, research and linguistic experts were consulted on the final version of the questionnaire. Finally, the questionnaire was pilot tested. Comments from the research supervisors, field and language experts and the pilot test were encouraged, and suggestions were incorporated. The questionnaire went through the stages of preparation, translation and the pilot test.

4.1.4. Research questionnaire design

The final version of the questionnaire consisted of four parts: demographic information, safety climate, communication ratings and open-ended questions. The majority of the questions were taken from the SAQ and others were added as required by the research questions and research focus as detailed in the following sub-headings (Appendix 1).

4.1.4.1. Demographic information

This part consisted of the basic demographic information: gender, age, nationality, language spoken at home, job, years of professional experience, and years of experience in the hospital from which data were collected.

4.1.4.2. Patient safety climate

This section included 38 closed-ended questions. It used a 5-point Likert scale with responses of *strongly disagree*, *disagree*, *neutral*, *agree* and *strongly agree*.

The safety climate from the SAQ was used in this part. It consists of a 30-item scale intended to measure six dimensions: teamwork climate (6 items), safety climate (7 items), job satisfaction (5 items), stress recognition (4 items), perception of management (4 items) and working conditions (4 items).

Eight new elements were added to this section, mainly to explore the effects of the local culture on the safety culture in operating theatres. The researcher's experience in operating theatres with a multinational workforce created interest in exploring some of those issues. Two items addressed gender; three addressed cultural difference; one addressed working consecutive night shifts; one addressed communication of new policies; and one addressed patients' disclosure of important medical history.

4.1.4.3. Quality of communication ratings

This question asked each respondent to indicate the quality of communication experienced with other professionals in performing their most recent surgical procedure. The professionals consulted were surgeons, anaesthetists, operating theatre nurses, anaesthesia technicians, surgical technicians, support staff (e.g., receptionists and cleaners), ward nurses, recovery personnel, ICU personnel and others that respondents might recommend. The respondents were given six responses to rate the quality of communication: *very low*, *low*, *adequate*, *high*, *very high* and *not applicable*, in light of the fact that not all types of operation required all of those professions to attend.

This question was based on a modified version of the SAQ. One question originally pertained to the rating of communication and collaboration. This was seen as a dual and possibly confusing question; communication and collaboration are important but separate elements of teamwork. A person could be an excellent communicator who preferred working alone, or a great team member with limited communication skills. This was reworded to focus on the quality of communication. Another question asked about the quality of communication and collaboration within a certain profession but did not specify a time limit. It was changed to specify communication in the latest surgery, given that the teams in operating theatres are dynamic. Specifying the quality of communication in the latest surgery created the need for another category of responses – *not applicable* – as it could not be assumed that communication would be carried out with all the listed professions in a single surgery.

4.1.4.4. Open-ended questions

Two open-ended questions were added to the questionnaire. One question asked about the effect of Saudi culture on patient safety, in the hope of exploring aspects of Saudi culture that members of a multinational staff might believe affect patient safety. The other question asked about ways to improve patient safety in the respondents' workplace based

on their experience. In addition to those two questions, the respondents were given space to make any comments that they wished.

4.1.4.5. Overall patient safety

Respondents were asked to assign a patient safety grade to their department. Respondents were given five choices: *failing*, *poor*, *acceptable*, *good* and *excellent*. This question appears in both the SAQ and the HSOPSC instruments.

4.1.4.6. Language used to answer

The final version of the questionnaire was in two languages on a single form (see the next sub-section, “Translation”). A question was added asking respondents to indicate the language they used in answering the questionnaire. This question was added to assess the quality of translation.

4.1.4.7. Translation

The data were collected in an Arabic-speaking country. English is used in Saudi Arabia as a second language, mainly by multinational workers who do not speak Arabic (Walston et al., 2010). The official language in the MOH’s hospitals is English; however, Arabic can be spoken only (Tumulty, 2001). The questionnaire (in English language) was translated into Arabic, and both versions were incorporated into a single form. This was done to accommodate the majority of the research population and to convey a sense of cultural understanding and sensitivity to the respondents. The questionnaire went through rigorous translation and validation. The research supervisors were consulted at every step of the validation and their comments were integrated into the final draft.

The researcher translated the final English language of the questionnaire into Arabic. The researcher’s mother tongue is Arabic and he speaks English fluently, and has obtained undergraduate and graduate degrees in English-speaking countries. The Arabic

version of the questionnaire was then back-translated into English by two field experts and one expert in linguistics.

The first expert has worked in the operating theatres of different hospitals in Riyadh for more than 18 years. His native language is Arabic and he speaks English fluently. He earned undergraduate and graduate degrees from English-speaking countries and was completing his PhD in Australia at the time of translation. The second expert has worked in operating theatres in several hospitals in Riyadh for more than 11 years. His native language is Arabic and he speaks English fluently: his undergraduate degree was obtained in Australia. He earned a Master's degree in quality and safety from Saudi Arabia. At the time of translation he was working in the Quality and Safety Department in a large hospital in Riyadh. This role gave him broad knowledge about research in safety in Saudi Arabia to add to his familiarity with the operating theatre.

The Arabic version of the questionnaire was sent to each expert for back-translation into English. After receiving the back-translation, the translator's comments were investigated and the questionnaire modified accordingly. Both English and Arabic versions of the final questionnaire were returned to each expert for review, and their feedback was again discussed and incorporated as necessary.

In recognition of the importance of translation accuracy, a linguist was consulted, a Saudi national lecturing at a Saudi university. He received his PhD from a university in Australia and had expertise in English–Arabic translations. As with the field experts, comments from the linguistic expert were discussed with the supervisors and changes were made as needed.

Both Arabic and English versions of the questionnaire were incorporated into a single form. English is written from left to right: Arabic is written from right to left. The researcher took advantage of this distinction by reserving the left half of the page for English questions and the right side for the same questions in Arabic. In other words, both

Arabic and English versions of each question are on the same line of the page with only one possible answer for each question. To prevent the respondents from becoming confused and replicating their answers, only one space (or choice) was provided for each question. This was arranged by using the centre of the line for the possible answer on the five-point Likert scale, regardless of whether the respondent read it in English or in Arabic. Therefore, if a respondent was reading an item in English, the choices lay just after the item, and the same for respondents who read the same item in Arabic (Appendix 1).

Combining English and Arabic in the same form ensured that a respondent did not answer two questionnaires and corrupt the data. In addition, it made the distribution of the questionnaires easier.

4.1.4.8. Pilot test

The final questionnaire was pilot tested in a hospital in Riyadh City. The pilot respondents included three surgeons, three anaesthetists, three nurses and three anaesthesia technicians. A minimum of one male and one female from each group was included in the pilot to reflect the settings where data were collected. The researcher also made sure that at least one member of each group answered in Arabic and one in English. The researcher asked each respondent to keep track of the amount of the time taken to complete the questionnaire. The researcher then sat with each respondent and asked about the clarity and difficulty of the questions and how well they were understood. Their comments were considered and changes were made where necessary. This process was to ensure that there was no room for misinterpretation by respondents of different genders or professions. In addition, the researcher wanted to make sure that the questions were easy to understand for all respondents.

4.1.5. Research population

This study targeted health care workers in operating theatres at the MOH's general hospitals in Riyadh City. At the time of data collection, the MOH managed two medical cities, two general hospitals and one women's and children's hospital in Riyadh City (Table 4.1).

Table 4.1: Overview of participating sites

Site	Year established	# of operating theatres
Site A (264-bed general hospital)	1985	6
Site B (200-bed general hospital)	1987	4
Site C (310-bed women & children's hospital)	1987	8
1400-bed medical city with two different operating theatre departments (site D and E):		
Site D (General hospital)	1956	13
Site E (Maternity & children's hospitals)	1977	8
Site F (1095-bed Medical city)	2004	30

Note: information collected from different sources (High Commission for the Development of Arriyadh, 2011; King Fahad Medical City, 2011; King Saud Medical City, 2011; Mufti, 2000).

The study was designed for those professionals who could be expected to attend each operation, in order to obtain more generalisable results. Each operation usually has a minimum of one surgeon, one anaesthetist, one anaesthesia technician and two operating theatre nurses (including surgical technicians). These four groups were the target population of this study.

4.1.5.1. Sample and sampling

Sampling the population is recommended if the total population cannot be surveyed. For this study, the entire population was included in order to compare groups. Before the collection of the data, the number of possible participants was obtained from each one of the targeted four departments in each hospital. The total population of the study was 1,068 potential respondents in the targeted hospitals. Surgeons represent 36.2%

(n = 387) and nurses 42.8% (n = 457). Anaesthetists and anaesthesia technicians represented 10.1% (n = 108) and 10.9% (n = 116) of the study population, respectively.

4.1.6. Data collection

After gaining the required ethical approval from all concerned organisations (see section 4.1.8 for details about ethics), the researcher approached each head of department to request assistance in distributing the questionnaire and in encouraging participation. With the consent of the department head, the researcher was introduced and given 5-10 minutes at the end of the weekly departmental meeting to talk about the study. The researcher introduced the study, the questionnaire and the participation process, and distributed the questionnaire to all attendees. Each prospective participant was given a questionnaire, information sheet and a return envelope. Each department head was asked to have the completed questionnaires returned to the department secretary. The secretaries were asked about the number of prospective participants who had not attended the meeting; these people were sent a copy of the questionnaire and the information sheet, and a return envelope, through the hospital's internal mail system.

Two reminders were provided two weeks apart. As with the distribution process, the researcher was given three minutes at department meetings to encourage participation and to thank the respondents who had returned the questionnaires. Each department head was also asked to encourage faculty participation. Questionnaires were not given out in the reminder meetings to prevent anyone from returning more than one questionnaire.

4.1.7. Data analysis

The quantitative data were analysed using SPSS version 19 (IBM, 2012). The researcher entered and checked all of the data for outliers and missing values. The following rules were followed in dealing with missing data:

1. Any case with more than two missing values on the same dimension of the safety climate was excluded from the analysis for that dimension.
2. Any case with two dimensions not analysed was deleted from the data set.

A response rate of 60 or more was considered representative of a culture/climate (Sexton et al., 2006a).

Results were subjected to descriptive and inferential tests. Demographic results were presented descriptively; whereas, the original scale, new items and quality of communication ratings were subjected to inferential testing. Different inferential tests were introduced and discussed in the results chapter (chapter 5) whenever they were used.

Answers to the open-ended questions were analysed using NVivo version 9 (QSR International Pty Ltd., 2012). Responses to each question with the respondent's gender, age, profession and site were entered into the program for analysis. Themes were extracted and associated with the other factors.

4.1.8. Ethical considerations

Ethical approval from all concerned parties was obtained and the researcher complied with their specifications (Appendices 2 and 3). The researcher also anticipated the ethical challenges that could arise during the course of the study and prepared a contingency plan (Polit & Beck, 2004).

The study was anonymous and responses were linked only to the department, not to individuals. It was linked to departments to explore their climate. In addition, participation was voluntary and a participant information sheet (PIS) accompanied each questionnaire.

The PIS explained the study and its ethical considerations (Appendix 1). Participants were informed that returned questionnaires implied informed consent to participate according to the information outlined in the PIS, and that they could withdraw from the study at any stage without any consequences. The participants were also informed

of what was required of them. The researcher's contact details were included in case participants needed to discuss any issue concerning the study. Although the study was low risk, possible associated risks were anticipated and counselling contacts were obtained, to be provided if needed.

The data were kept secure, with access limited to the researcher and his supervisors to protect the privacy of the participants. Hard copies of the data were stored in a secured, locked cabinet. Soft copies were kept in password-protected computers. The data will be kept for five years after which they will be destroyed according to the governing guidelines.

4.2. Qualitative method

4.2.1. Qualitative research

Following the sequential mixed methods design, the qualitative method was used in the second phase of the study. Qualitative research is interpretive, emergent and evolving, taking place in natural settings and focusing on context by employing different methods in a humane way (Rossman & Rallis, 2003). It is concerned with deep understanding of social issues that affect the social context and human interactions and behaviours (Creswell, 2014). Merriam (2009, p. 5) indicates that “qualitative researchers are interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences”. Maxwell provides a similar definition by defining qualitative research as

research that is intended to help you better understand (1) the meanings and perspectives of the people you study—seeing the world from their point of view, rather than simply from your own; (2) how these perspectives are shaped by, and shape, their physical, social, and cultural contexts; and (3) the specific processes

that are involved in maintaining or altering these phenomena and relationships.
(2012, p. viii)

It is difficult to define qualitative research. Denzin and Lincoln (2011) argue that the difficulties in doing so indicate that it would be more appropriate to characterise qualitative research than to define it. Marshall and Rossman (2011, p. 2) provide one of the most holistic characteristics of qualitative research, indicating that it is “pragmatic, interpretive, and grounded in the lived experiences of people”.

One of the important characteristics of qualitative research is the use of the researcher as a primary tool or instrument (Creswell, 2013; Hatch, 2002; Lincoln & Guba, 1985; Marshall & Rossman, 2011). This intensifies the importance of the role that the researcher plays in all elements and processes of qualitative research. The subjectivity of this type of research necessitates the establishment of the concept of trustworthiness (Cho & Trent, 2006; Lincoln & Guba, 1985). Trustworthiness is discussed at the end of this section after the presentation of the method used to collect and analyse qualitative data.

Qualitative research methods are defined by Schensul (2012, p. 85) as “the tools qualitative researchers use to investigate their research topic and construct their argument and the decisions they make as to how to use those tools and with whom”. The tools share characteristics that have been discussed in the methodology and methods literature: they include settings, sampling, methods of data collection and analysis, ethical considerations and trustworthiness of the findings.

4.2.1.1. Semi-structured interviews

Individual semi-structured interviews in a private room at the participants' workplaces were the main method used for the collection of qualitative data. Semi-structured interviews are seen as a suitable method for collecting data as they enable

participants to elaborate on issues that are raised. Participants were asked to reflect on the issues in their own words, which provided more credibility and face validity for the data.

Interviews in general have been described as “a particular kind of conversation” (Green & Thorogood, 2004, p. 79) and as “literally an inter view, an inter change of views between two persons” (Kvale & Brinkmann, 2009, p. 2). Patton (2002) indicates that there are three types of interview, ranging from unstructured or conversational to very structured or standardised. Between these polar opposites lies the semi-structured interview (pp. 341–347). Semi-structured interviews are the most popular data-generating method in qualitative research, and specifically in qualitative health research (Green & Thorogood, 2004; Marshall & Rossman, 2011). They are seen as cooperation between the researcher and the participant. While the researcher brings certain topics to the interview for discussion, the participant’s responses actually determine the type and relative importance of the constructed knowledge (Green & Thorogood, 2004). Semi-structured interviews are used to acquire respondents’ perceptions and reflections on certain topics which guide the interviews (Merriam, 2009) They are progressive in nature, and new questions and topics may emerge and be investigated in a single interview or in subsequent ones (Hansen, 2006); this characteristic was considered important for the second phase of this study. As each interview progressed, new questions emerged that helped in developing more understanding of the issues under discussion.

As this part of the research was influenced by the first phase, open-ended questions, which were guided by the results of the first component, were used. The interviewer used prompted questions to encourage respondents to provide enough depth of the discussed topics to explore some of the issues that the interviewee mentioned in the course of the interview.

Only one interview was conducted with each participant. The interviews were face-to-face and lasted an average of 45 minutes. The interview guide consisted of core

questions to allow respondents to explain their views and experiences, and prompt questions used to explore more of the discussed points (Appendix 4). Participants' interpersonal elements (e.g., whether they were relaxed, not feeling well, nervous, or not willing to share their experiences) were noted. Notes were taken during and after the interview and were used in the analysis process. The researcher also kept a reflective journal throughout the process of data collection and analysis. A digital audio recording device was used to record the interviews, with a second recording device as a back-up. Interviews were conducted in English, the official language used in MOH hospitals.

The researcher started the interview by introducing himself and the study. He then went through the consent form, reading and explaining each element. This was done to make sure that the respondents had understood the consent form and any concerns could be addressed. Once the participant was satisfied and willing to take part, the consent form was signed and obtained by the researcher. At the end of the interview, the researcher recapped the issues that had been discussed to confirm his understanding of the participant's point of view. This was done to increase the rigour of the study as the researcher confirmed his understanding of the issues the participant had discussed.

The study employed the saturation process to decide the number of participants: interviews continued until there was no new information uncovered in new interviews (Charmaz, 2006).

4.2.2. Data collection

4.2.2.1. Sample and sampling

Marshall and Rossman (2011) argue the importance of sampling decisions in improving the trustworthiness and rigour of a study. However, because of the exploratory nature of qualitative research, researchers may enter the field without knowing the sample or having a solid sampling strategy (Marshall & Rossman, 2011). Employing the mixed

methods approach, where the first phase informs the second one, helps in the choice of sample and sampling techniques. In addition, the choice of the sample and sampling techniques is influenced by the theoretical framework (Denzin, 1989).

Stratified purposive sampling was used for the qualitative phase. This procedure had two parts, as its name implies: stratified and purposive. While the first phase of the study targeted all the operating theatre personnel in anaesthesia and surgery, the results indicated that responses from one group, namely surgical nurses, were statistically significantly different from other groups. The sample for the second phase of the study was stratified to include only this group. Stratification was considered important to focus on the group that could best enrich the study about basic cultural assumptions, as informed by the results of survey.

A purposive sample is mainly created by the selection of participants who are thought to be information-rich, in order to construct a deep and holistic understanding of issues under investigation (Burns & Grove, 2005; Patton, 2002). Nurses with a minimum of one year's experience in operating theatres were thought to be able to reflect on the deeper level of both the organisational and safety cultures.

Within the purposive sampling framework, the critical case sampling approach was employed to select cases that were thought to be sufficiently sophisticated to construct knowledge about the relevant issues (Patton, 1990). One of the advantages of critical case sampling is the transferability of the constructed knowledge to other cases (Miles & Huberman, 1994). The results of the first phase, following the explanatory sequential mixed methods research design, helped in identifying suitable critical cases for the second phase of data collection. It was used as magnifying lenses to identify participants for the second phase. Non-Saudi female nurses who did not speak Arabic, the Saudi Arabian national language, with a minimum experience in Saudi Arabia of one year, were chosen from two sites as the critical cases for the second phase.

The non-Arabic-speaking female nurses had not been raised in Saudi Arabia and had not been exposed to Saudi culture until later in life; their understandings were not shaped by Saudi culture. Nevertheless, they were expected to have had time to experience and immerse themselves in all levels of cultures (national, organisational and safety), and could describe and discuss them. They could reflect on their first experience of the national culture and also on their experience of it after they had lived within it for a year or more. In addition, they could describe the organisational and safety cultures as both outsiders (reflecting on their experiences) and insiders (as being part of that organisation). The second phase thus targeted participants who

- were female nurses;
- were non-Saudi, and non-Arabic speaking;
- had been working in the operating theatres for at least one year.

4.2.2.2. Ethical considerations

It was mentioned in every application to the ethics committees in the first phase study that there would be a second phase study. Before the commencement of the second phase, ethics approval was sought from all concerned ethics committees (n = 4). Two ethics committees granted extensions to the initial approval after revision of the second phase application; the other two granted new approvals (Appendix 3).

Researchers should acknowledge the ethical responsibilities they have towards participants in the creation of knowledge (Lincoln, 2009). Studies are usually conducted according to ethical codes and approvals from institutional review boards or human research ethics committees. Guillemin and Gillam (Guillemin & Gillam, 2004, p. 263) propose a classification of ethics as “procedural ethics” and “ethics on practice”. The former indicates the codes of ethics that are presented by organisations and ethics committees. The latter is more concerned with the practice of researchers and the handling

of any dilemmas that they face in the field. Despite minor variations between the ethics codes, most overlap on two main principles: informed consent, and confidentiality and privacy. The researcher was aware of both types of ethics and strove to conduct the research in an ethical manner at both levels. Close supervision also helped in achieving this ethical conduct.

4.2.2.3. Informed consent

Almost all texts on method discuss informed consent as a principal ethical obligation (Christians, 2011; Piper & Simons, 2005). Polit and Beck (2004, p. 151) indicate that “informed consent means that participants have adequate information regarding the research; are capable of comprehending the information; and have the power of free choice, enabling them to consent voluntarily to participate in the research or decline participation”. The study’s consent form included most of the ethical issues that needed to be explained and maintained:

- The principle of minimising risk for the participants by making them aware that their participation or refusal to participate would not jeopardise their relationship with their colleagues, managers or employer.
- The principle of volunteering, by which the participants were informed that participation was voluntary and they could withdraw at any time without any consequences.
- The contact details of the researcher and his supervisors, provided for any discussions or expressions of concern.

4.2.2.4. Confidentiality and privacy

Confidentiality, privacy and anonymity were a priority for the researcher during all phases of data collection, analysis and presentation. Several steps were taken to ensure best practice:

- All identifying information of participants and non-participants was removed from the transcripts.
- Other identifying information such as consent forms was stored separately in a locked cabinet in the researcher's office at the University of Adelaide.
- The researcher received close guidance and supervision from his research supervisors at all research stages, through regular meetings and discussions.
- Special care and consideration were taken in presentations of the findings.

4.2.3. Recruitment

After gaining the proper ethics approval, the heads of departments in each of the targeted hospitals were contacted to facilitate the recruitment process. The process was much easier in this phase as it followed contact with potential participants in the first phase data collection. As in the first phase, the researcher targeted the departments' regular meetings to provide an overview of the study and encourage the nurses to participate. The researcher concisely explained the nature of the study and the interviews, never exceeding five minutes in length. Importantly, the researcher indicated what was required from potential participants. At the end of the presentation, cards with the researcher's name and contacts (phone number and email address), and the research topic, were handed to interested parties who might like to contact the researcher at a later time. After the presentation, the researcher stayed for the remainder of the day in the operating department and made himself available for inquiries and discussion. He met potential participants and elaborated about the study and the process of participation. These participants might have contributed to the surveys collected a year before, but this was not known to the researcher. A schedule of interviews was developed and communicated to the nursing management in the operating theatre.

The nursing management in the operating theatre provided a convenient and private office in which interviews could take place. The schedule of the interviews was agreed between the participant, the researcher and the nursing management in the operating department. It included providing the office for the whole interview based on the schedule of interviews, and relieving the participant from duties for the duration of the interview.

4.2.4. Data analysis

Thematic analysis was used to analyse the interview data. This has been described as the most common approach in qualitative analysis, allowing the participants, collectively, to identify the significant issues on a certain topic (Green & Thorogood, 2004). The conduct of the thematic analysis starts concurrently with the data collection. Several books have discussed this process, in particular Creswell (2014, pp. 196–201) and Marshall and Rossman (2011, pp. 209–221), whose ideas shaped the analysis undertaken by the researcher.

First the data were transcribed and checked against the recordings in order to prepare them for analysis. Then the researcher spent time reading and immersing himself in the data, keeping a journal to record formative ideas and analyses. After that, the researcher started the coding process on hard copies of the transcribed interviews. It was at this level of analysis that he started to classify chunks of the texts into shorter and meaningful codes. The researcher kept writing memos as he continued the coding process. At the end of the coding, the researcher entered the data into NVivo software and recoded the text electronically, based on the hard copy coding system. This last step helped the researcher to confirm the coding process and immerse himself in the newly developed codes. New assumptions were developed and recorded in the research journal. Themes and categories developed more and more with each iteration. Next, the researcher worked with the extracted codes, the results of the first study and the theoretical framework, to

conceptualise, describe and connect themes as they emerged. This helped to form themes that were strongly connected and reflected the basic assumptions of the organisational and safety cultures. The process did not end when the themes were formed: the researcher went back to the codes, categories and themes and investigated their connectivity. Then themes were merged or split, based on their strengths and their place in the whole thematic structure. Finally, the researcher interpreted the themes and linked them to each other and to the whole study: that is, the first phase's results and the theoretical framework.

Each step involved data reduction. The research journal was used to add new entries and was continually referred to by the researcher. The research supervisors were consulted at each step of the analysis and provided invaluable guidance and discussion. A sample cross-coding of an interview transcript was performed at the beginning of the coding process: each supervisor and the researcher coded the text and then a comparison was made to check the credibility and dependability of the researcher. Supervisors also checked the codes' connectivity to the themes after these had been formed; and the themes' interconnectivity was also checked.

4.2.4.1. Trustworthiness

In their iconic book *Naturalistic Inquiry*, Lincoln and Guba (1985) discuss the concept of trustworthiness in qualitative research. They list four elements of trustworthiness that should be applied in all qualitative research inquiries. Despite criticism and attempts to develop other elements (Cho & Trent, 2006), those four are still the main principles of trustworthiness in qualitative research. The following discussion outlines those elements and their applicability to the current research based on the original work of Lincoln and Guba (1985, pp. 301–331)

4.2.4.2. Credibility

Credibility is a qualitative term that is concerned with the truthfulness and the level of confidence in our findings and interpretations (Lincoln & Guba, 1985). The credibility of findings is established when human experiences are described as lived and perceived by the participants to the point where such descriptions are recognised immediately by others who share similar experiences (Sandelowski, 1986). Krefting (1991) argues that credibility is the most important principle of qualitative research assessment. This importance is based on the assumption of the existence of multiple realities that need to be presented accurately as revealed by the participants (Lincoln & Guba, 1985).

The researcher's awareness of the importance and difficulty of presenting credible findings helped in careful planning and conduct in the current study. Interviews with the participants allowed them to express their views freely. Recordings and transcripts helped the researcher to immerse himself in and become familiar with those perceptions and views; keeping a research journal also helped in organising and understanding them.

4.2.4.3. Transferability

Transferability refers to the applicability of the research findings to other contexts or groups (Guba, 1981). Transferability can be addressed by the provision of sufficient description for others to compare contexts and decide on relevance (Lincoln & Guba, 1985). In this thesis the researcher has tried to provide as many details about the study and the settings as possible so readers can have a clear picture of the research settings. With the details presented the reader should be able to apply the research findings to similar settings, thus making the research more transferable.

4.2.4.4. Dependability

Dependability refers to the stability of findings over time (Sinkovics & Ghauri, 2008). One way in which dependability can be ensured is to perform "auditing" by a

different investigator (Lincoln & Guba, 1985, p. 317). The research supervisors acted as auditors throughout the research. They provided critical comments that improved the dependability of the research.

4.2.4.5. Conformability

Conformability refers to the fact that the findings were engrained in and reflective of participants' perceptions and experiences (Sinkovics & Ghauri, 2008). As with dependability, the supervisors audited the work and maintained conformability during all phases of the research. Keeping a reflexive journal during data collection and analysis also helped in documenting all the steps of the research, which made it easier to go back and reflect on decisions taken during the research process.

4.3. Summary

In summary, this chapter has presented both the quantitative and qualitative methods that were used to collect, analyse, interpret and present the data from both phases of the study. It presented the sample, the sites and the data collection process for each phase. Ethical considerations were presented for both phases.

Chapter 5: Survey Results

This chapter presents the results from the survey, the first phase of the study. It starts by outlining the response rate and the demographic information of the respondents. Next, it presents the descriptive and inferential results of the safety climate and the rating of the quality of communication between professional groups. Finally it presents the results of the open-ended questions.

5.1. Response rate

The survey was distributed to 1,068 operating theatre personnel in six different operating theatre departments. A total of 659 respondents (61.7%) completed questionnaires that were returned by the end of the data collection period (Table 5.1). The response rate from each site ranged from 52.1% to 70.9% and the response rate from each profession ranged from 46.3% from anaesthetists to 71.8% from nurses.

Table 5.1: Response rate by site and profession

Category	Number of questionnaires			
	Distributed	Returned	%	
Site	Site A	82	52	63.4
	Site B	71	37	52.1
	Site C	138	89	64.5
	Site D	333	176	52.9
	Site E	128	81	63.3
	Site F	316	224	70.9
Profession	Surgeon	387	212	54.8
	Anaesthetists	108	50	46.3
	Nurses	457	328	71.8
	Anaesthesia Technicians	116	69	59.5

Returned questionnaires were screened for eligibility for analysis. This screening resulted in the exclusion of 10 questionnaires from the returned 659 questionnaires due to incompleteness. Ultimately, 649 (60.8% response rate) of the responses were valid. A

response rate of more than 60% is considered good (Babbie, 2010) and is recommended for safety climate research (Sexton et al., 2006a).

5.2. Participants' demographic information

Key demographic information was obtained from the respondents through the questionnaire. A summary of gender, age, nationality, language spoken at home, tenure and experience is reported in Table 5.2. More than half of the respondents were female (n = 345, 53.2%), and that all the professions were male-dominated except for nursing. The majority of respondents were younger than 39 (n = 408, 62.9%); the majority of surgeons and anaesthetists were aged between 30 and 49 (n = 158, 61.7%). Due to the low number of respondents in the oldest group, over 60 (n = 13.2%), this group was merged with the closest group, 50–59 years (n = 82, 12.6%), into a new group called over 50 years old (50+). The new category included 95 respondents (14.6%). As a result, the age groups were reduced from five groups to four in all further analysis.

Respondents were of 28 different nationalities; Table 5.2 presents the most frequently indicated nationalities. When the results were classified by profession, some nationality clusters were evident: for example, nurses were predominantly either from the Philippines or India. The other three professional groups were mainly from Arabic nations.

To quantify the nationalities and for ease of analysis, the nationalities were categorised into three groups, based on their common cultural background:

1. Saudis: local professionals from Saudi Arabia, who are most familiar with patients' customs and dialogue (n = 191, 29.4%).
2. Arabs: professionals from countries speaking Arabic, the national language of Saudi Arabia, but who might not be familiar with some patients' customs and dialogue (n = 161, 24.8%).

3. Others: professionals not from Saudi Arabia or from Arabic-speaking countries, who are less familiar with the culture and the language than their Arabic and Saudi colleagues (n = 264, 40.7%).

Saudis have a common understanding of local patients' languages and customs. Although Arabs can speak the same language, they are not necessarily familiar with some of the cultural customs and assumptions. The other professionals add another dimension because of their lack of familiarity with the Arabic language.

In addition to nationality, the respondents indicated the language they used in their homes. Several languages were indicated, which were grouped into three main categories: Arabic, English, and neither Arabic nor English. The first included those professionals who spoke the language of the host country in their homes. The second included those professionals who spoke the official language spoken in hospitals in their homes; it also included respondents who indicated that they spoke English and another language at home. The third category included all the professionals who indicated speaking their native language—neither Arabic nor English—at home. Table 5.2 indicates that the majority of respondents spoke Arabic in their homes (n = 359, 55.3%).

Despite many respondents indicating that they had more than 10 years of experience (n = 287, 44.2%), the majority indicated that they had spent less than six years (n = 467, 72%) at their current hospitals at the time when the data were collected (Table 5.2). Almost three-quarters of the respondents (n = 467, 72%) had worked at their hospitals for six years or fewer. Actually, almost half of the respondents had worked in the hospital in which data were collected for three years or fewer (n = 315, 49.1%). Generally respondents tended to have more years of experience in their profession than tenure in their hospital. Figure 6 compares respondents' tenure and experience.

Table 5.2: Summary of key demographic information classified by respondents' professions

Variable	Surgeons	Anaesthetists	Nurses	Anaesthesia technicians	Overall
	N (%)	N (%)	N (%)	N (%)	N (%)
Gender (missing n = 4; 0.6%)					
Female	54 (26.1)	11 (22.4)	265 (83.9)	11 (16.2)	345 (53.2)
Male	153 (73.9)	38 (77.6)	51 (16.1)	57 (83.8)	300 (46.2)
Age (missing n = 6, 0.9%)					
< 30	34 (16.4)	6 (12.2)	115 (36.4)	27 (39.7)	182 (28.0)
30–39	67 (32.4)	13 (26.5)	116 (36.7)	27 (39.7)	226 (34.8)
40–49	63 (30.4)	15 (30.6)	49 (15.5)	12 (17.6)	140 (21.6)
50–59	38 (18.4)	9 (18.4)	33 (10.4)	2 (02.9)	82 (12.6)
60 +	4 (1.9)	6 (12.2)	3 (0.9)	0 (0.0)	13 (2.0)
Nationality (missing n = 34, 5.2%)					
Saudi	69 (33.2)	9 (18.4)	63 (19.9)	50 (73.5)	191 (29.4)
Philippines	0 (0.0)	1 (2.0)	112 (35.4)	0 (0.0)	113 (17.4)
India	6 (2.9)	5 (10.2)	85 (26.9)	2 (2.9)	98 (15.1)
Egypt	46 (22.2)	12 (24.5)	7 (2.2)	3 (4.4)	68 (10.5)
Syria	20 (9.7)	7 (14.3)	5 (1.6)	2 (2.9)	34 (5.2)
Sudan	18 (8.7)	1 (2.0)	4 (1.3)	2 (2.9)	25 (3.9)
Other*	43 (10.2)	10 (20.4)	21 (6.6)	8 (11.6)	86 (13.3)
Language spoken at home (missing n = 23, 3.5%)					
Arabic	173 (83.6)	36 (73.5)	84 (26.6)	66 (97.1)	359 (55.3)
English	10 (4.8)	6 (12.2)	70 (22.2)	1 (1.5)	87 (13.4)
Other [§]	21 (10.1)	7 (14.3)	151 (47.8)	1 (1.5)	180 (27.7)
Tenure (missing n = 8, 1.2%)					
< 1 yr.	53 (22.4)	11 (22.4)	49 (15.5)	9 (13.2)	122 (18.8)
1–3 yrs.	50 (24.2)	18 (36.7)	109 (34.5)	15 (22.1)	193 (29.7)
4–6 yrs.	42 (20.3)	8 (16.3)	82 (25.9)	19 (27.9)	152 (23.4)
7–9 yrs.	23 (11.1)	4 (8.3)	48 (15.2)	18 (26.5)	96 (14.8)
10 + yrs.	37 (17.9)	7 (14.3)	27 (8.5)	7 (10.3)	78 (12.0)
Experience (missing n = 7, 1.1%)					
< 1 yr.	15 (7.2)	1 (2.0)	17 (5.4)	6 (8.8)	39 (6.0)
1–3 yrs.	28 (13.5)	7 (14.3)	36 (11.4)	10 (14.7)	81 (12.5)
4–6 yrs.	23 (11.1)	6 (12.2)	82 (25.9)	12 (17.6)	123 (19.0)
7–9 yrs.	35 (16.9)	5 (10.2)	51 (16.1)	21 (30.9)	112 (17.3)
10 + yrs.	105 (50.7)	105 (59.2)	129 (40.8)	19 (27.9)	287 (44.2)

* Number of participants from other nationalities (n = 22 other nationalities not reported here)

[§] Indicates native languages other than Arabic or English.

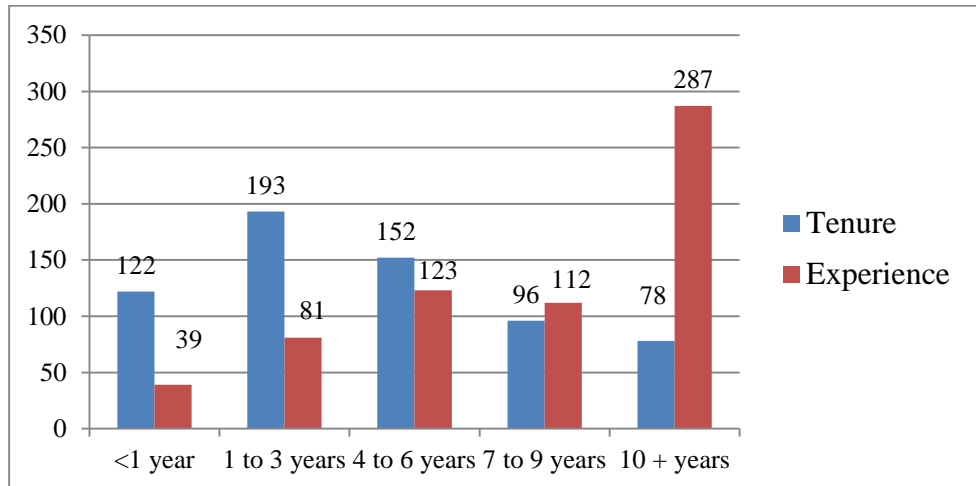


Figure 6: Comparison of the number of respondents in each tenure and experience group

Each questionnaire was written in both Arabic and English and the respondents were asked to indicate which language they used to answer the questions. More than half indicated that they answered in English (n = 355, 54.7%). Another 267 respondents answered in Arabic (41.1%). Twenty-seven respondents did not indicate which language they used (4.2%).

5.2.1. Patient safety overall grade

Participants were asked to rate the overall patient safety grade at their hospital. Almost half indicated that the overall grade was good (n = 310, 47.8%), and 218 respondents indicated that it was excellent (33.6%), on a 5-point Likert scale ranging from failing to excellent. Overall patient safety in their department was considered acceptable by 93 respondents (14.3%). Twelve respondents (1.8%) indicated it was poor and only one chose failing (0.2%). Table 5.3 shows how each professional group rated the overall patient safety at their hospitals. The overall mean was 4.2 (standard deviation [SD] = 0.75). The lowest means were found in surgeons (\bar{x} = 4.04, SD = 0.70) and nurses (\bar{x} = 4.13, SD = 0.79).

Table 5.3: Number (and percentage) of respondents' ratings of overall patient safety based on profession

Response	Surgeons		Anaesthetists		Nurses		Technicians		Total	
	<i>n (%)</i>		<i>n (%)</i>		<i>n (%)</i>		<i>n (%)</i>		<i>n (%)</i>	
Failing	0	(0.0)	0	(0.0)	1	(0.3)	0	(0.0)	1	(0.2)
Poor	5	(2.4)	1	(0.3)	6	(1.9)	0	(0.0)	12	(1.8)
Acceptable	31	(15.0)	5	(10.2)	54	(17.1)	2	(2.9)	93	(14.7)
Good	119	(57.5)	21	(42.9)	136	(43.0)	31	(45.6)	310	(47.8)
Excellent	49	(23.7)	21	(42.9)	108	(34.2)	35	(51.5)	218	(33.6)
Mean	4.04	(0.70)	4.29	(0.74)	4.13	(0.79)	4.49	(0.56)	4.15	(0.75)
(SD)*										

Note: * Responses were given values (failing = 1, poor = 2, acceptable = 3, good = 4 and excellent = 5) to calculate the mean and standard deviation.

5.2.2. Summary of demographic information

A response of more than 60% was achieved in the first phase of the study. Even though there were slightly more female respondents than male respondents, all the professions, except nursing, were male-dominated. More than half of respondents had Arabic origins and spoke Arabic; more than three-quarters of nurses were from non-Arabic origins.

While most respondents were younger than 39, the majority of surgeons and anaesthetists were between the ages of 30 and 49. Most respondents had more than 10 years' experience in their professions, but about half had been working at their hospitals for fewer than three years at the time of data collection. Most respondents believed that the overall patient safety at their hospitals was either good or excellent.

5.3. Patient safety scale

This section reports the analysis and results of the safety climate section of the survey. The original scale included six dimensions (30 items) that had been psychometrically tested and validated (Sexton et al., 2006a), and eight new items. The

reliability test was presented and followed by a confirmatory factor analysis for the previously tested subscales. Exploratory factor analysis was conducted for the new items. Means, correlations and regressions were also presented.

5.4. Psychometric analysis

5.4.1. Internal consistency

Internal consistency is commonly measured and reported using Cronbach's coefficient alpha which takes a value between 0 and 1; higher values indicate higher reliability. Nunnally (1978, p. 245) argues that acceptable values of Cronbach's alpha vary depending on the scale's purpose, but should not be less than 0.7. George and Mallery (2003, p. 231) indicate that the level of internal consistency could be described as excellent if values are above 0.9, good if between 0.8 and 0.9, acceptable if above 0.7, questionable if above 0.6, poor if above 0.5, and unacceptable below 0.5.

Cronbach's alpha for the original scale (30 items) in the current study was 0.88, which indicated that the scale had very good internal consistency. The original scale consisted of six dimensions or subscales that were tested individually. All dimensions were found to have acceptable (above 0.70) to good (above 0.80) values except for the 'perception of management' dimension ($\alpha = 0.44$) (Table 5.4).

Cronbach's alpha tends to be lower in scales with fewer than 10 items (Nunnally, 1978). In this case, inter-item correlation was investigated and found to be 0.17, which was below the recommended cut-off level of 0.2 (Briggs & Cheek, 1986, p. 115). Cronbach's alpha correlation value increased to 0.57 when item #7, "hospital management does not knowingly compromise the safety of patients", was deleted. The inter-item correlation mean also increased to 0.32. The structure of the dimension in terms of its constituent items via confirmatory factor analysis is discussed in the following section.

Table 5.4: Alpha correlation for each dimension

Dimension	Number of items	Alpha coefficient	Mean inter-item correlation
Teamwork climate	6	.76	.364
Safety climate	7	.71	.275
Job satisfaction	5	.75	.366
Stress recognition	4	.82	.539
Perception of management	4	.44	.174
	3*	.57	.324
Working conditions	4	.73	.407
Multicultural workplace[^]	3	.79	.562

Notes: * when item #7 was deleted.

[^] the new dimension (see sub-section 5.4.3)

5.4.2. Confirmatory factor analysis

The original scale was subjected to confirmatory factor analysis to test the underlying factorial structure of the overall scale using IBM SPSS Amos analysis program software version 21 (IBM, 2012). Because the data had a low number of missing values on each item (details are presented in the following section), they were subjected to factor analysis without the substitution of missing values. All items showed good regression on weight estimates except for item #7 and, to a lesser extent, item #13 (Table 5.5). These findings are in line with the results of the principal component analysis when Cronbach's alpha for the perception of management dimension improved from 0.44 to 0.57 by deleting item #7.

Table 5.6 shows the inter-correlation between the dimensions using Pearson's correlation coefficient. Other than the stress recognition dimension, all other dimensions were highly and positively correlated with each other. The stress recognition dimension was negatively correlated with all other dimensions. All the correlations were significant at $p < 0.001$ (two-tailed).

Table 5.5: Regression weight estimates

Dimension	Item #	Estimate	Standardised estimate	Standard error	Composite reliability
Safety climate	22	1.000	.566		
	15	.780	.507	.072	10.762
	14	.589	.385	.069	8.591
	13	.368	.188	.082	4.459
	12	.962	.618	.077	12.449
	11	1.094	.678	.083	13.243
	10	1.286	.703	.095	13.534
Teamwork climate	16	1.000	.633		
	17	1.240	.694	.087	14.197
	21	.870	.403	.097	8.984
	34	1.174	.620	.090	13.018
	35	.979	.624	.075	13.115
	36	1.027	.642	.077	13.414
Job satisfaction	1	1.000	.337		
	2	2.946	.741	.364	8.084
	5	2.846	.654	.362	7.856
	9	3.219	.768	.395	8.140
	37	2.311	.570	.305	7.564
Stress recognition	31	1.000	.620		
	29	1.183	.811	.077	15.296
	28	1.297	.840	.084	15.492
	27	1.020	.671	.075	13.578
Working conditions	25	1.000	.561		
	8	1.269	.600	.106	11.996
	4	1.462	.706	.109	13.362
	3	1.543	.731	.113	13.642
Perception of management	6	1.000	.738		
	7	-.056	-.036	.063	-.886
	23	.756	.581	.052	14.567
	26	.594	.401	.060	9.927

Note: the *p*-value was < 0.001 for all items except #7 (*p* = 0.375)

Table 5.6: Correlations among dimensions

	Teamwork climate	Safety climate	Job satisfaction	Stress recognition	Working conditions
Safety climate	.711*				
Job satisfaction	.639*	.653*			
Stress recognition	-.183*	-.205*	-.174*		
Working conditions	.599*	.696*	.691*	-.202*	
Perception of management	.482*	.516*	.535*	-.119*	.616*

Note: Pearson correlation is used for calculations; * correlations were significant at *p* < 0.01 (two-tailed).

Goodness-of-fit indices indicate an acceptable model fit. These indices include the chi-square test of absolute model fit (χ^2), Tucker–Lewis index (TLI), comparative fit index (CFI) and root mean square error of approximation (RMSEA). The standardised root mean square residual (SRMR) was not calculated as a result of using data with missing values.

The χ^2 test value was 1413.85 (df = 390, $p < 0.001$). Although it is recommended that the significance level for the chi-square test exceed 0.05 (Browne & Cudeck, 1993), this is difficult to achieve with a large sample size (Jöreskog, 1969). The TLI and CFI take values between 0 and 1, with values closer to 1 indicating a good fit (Bentler, 1990; Bentler & Bonett, 1980). The TLI and CFI yield values of 0.85 and 0.87, respectively. It is suggested that the TLI and CFI values should be above 0.90 for a good model fit (Browne & Cudeck, 1993), which indicates that the fit of the current model is slightly below optimal. RMSEA values can range from 0 (best fit) to more than 1 (poor fit) (Vandenberg & Lance, 2000). Browne and Cudeck (1993) argue that RMSEA values below 0.08 are indicative of good fit. The RMSEA value for the current model is 0.06 (0.060–0.067, $p < 0.001$), which results in a good model fit. The overall results of the goodness-of-fit indices indicate that the data has an acceptable fit for the model.

The original scale was found to have good psychometric properties when subjected to psychometric analysis. All the dimensions showed good internal consistency and good factorial properties, except for the perception of management, which had low internal consistency, and some issues were raised by the confirmatory factor analysis results. The statement “hospital management does not knowingly compromise the safety of patients” (item #7) showed the most negative effect on the perception of management dimension. Other than this issue, the dimension was found to have good psychometric properties.

5.4.3. The new dimension: multicultural workplace

Eight new items were added to the scale to explore the experiences of Saudi and non-Saudi professionals working together in a predominantly Saudi culture. Five of these items, which measured the same concept of attitude about working in a multicultural environment, were tested for dimensionality (Table 5.7). Two tests, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity, were conducted to determine the factorability of the data. For data to be considered for factor analysis, the KMO should exceed 0.50 (Kaiser, 1974) and Bartlett’s test of sphericity should be significant at $p < 0.05$ (Stevens, 2009). The five items were found to be suitable for factor analysis when the KMO was 0.59, which Kaiser (1974, p. 35) describes as “mediocre”. Bartlett’s test of sphericity was statistically significant ($p < 0.001$). The correlation matrix was also investigated and found to have many coefficients with satisfying strengths. Thus, the five items were subjected to exploratory factor analysis.

Table 5.7: The new items tested for dimensionality

Item #	Description	Mean (SD)	Tested for dimensionality
18	Working with personnel from different cultures does not reduce the quality of communication.	3.16 (1.23)	Yes
19	I do not find it difficult to work with employees of the opposite gender.	3.87 (1.07)	Yes
20	I do not find it difficult to work with employees from another culture.	3.76 (1.13)	Yes
32	I find it as easy to treat patients of the opposite gender as patients from my gender.	3.37 (1.25)	Yes
33	I find it as easy to treat patients from another culture as patients from my culture.	3.39 (1.24)	Yes
24	New policies are well communicated to the staff.	3.67 (1.02)	No
30	I have to work consecutive night shifts.	3.24 (1.18)	No
38	Patients here disclose important medical information to the treating professionals.	2.79 (1.01)	No

The five new items were subjected to principal component analysis (PCA), which revealed the presence of two components with eigenvalues above 1. These two components explain a total of 78% of the variance (43% and 35%, respectively). They are also evident in the scree plot (Figure 7). The component matrix shows that three items loaded strongly on the first component while the other two loaded strongly on the other. Both the unrotated and oblimin rotated loadings are similar (Table 5.8). Because the second component had only two elements, it was not considered a dimension or factor (Pallant, 2010). It was concluded that three elements contributed to the new multicultural workplace dimension and should be subjected to further psychometric tests (items # 18, 19 & 20).

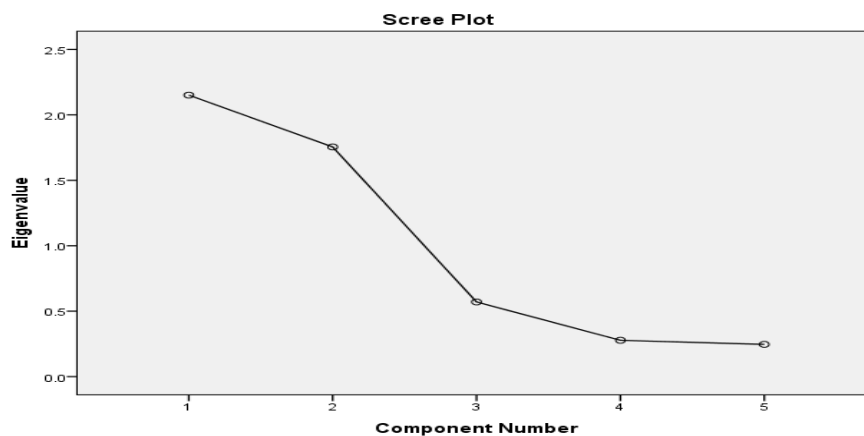


Figure 7: Scree plot showing two dimensions

Table 5.8: Pattern and structure matrix for PCA with oblimin rotation for two factors in the new dimension

Item #	Pattern coefficients		Structure coefficients		Communalities
	Component 1	Component 2	Component 1	Component 2	
20	.904	-.018	.905	-.046	.819
19	.841	-.123	.845	-.148	.729
18	.778	.126	.775	.102	.616
33	.017	.936	-.011	.935	.875
32	-.019	.930	-.047	.931	.867

Note: Bold font indicates the highest loading between the two components on each item

Cronbach's alpha was used to test the internal consistency reliability of the new dimension (three items), and was found to give a strong alpha coefficient of 0.79 despite the low number of items. The mean inter-item correlation was 0.56. In addition, the dimension had strong item-total correlations (range = 0.54 to 0.74). The multicultural workplace dimension was also found to have significant correlation with teamwork climate, safety climate, job satisfaction and stress recognition.

Table 5.9: Correlation between multicultural workplace dimension and other dimensions

	Teamwork climate	Safety climate	Job satisfaction	Stress recognition	Working conditions	Perception of management
Multicultural workplace	.218*	.132*	.135*	-.242*	.038	-.041

Note: Pearson correlation is used for calculations;

* correlations were significant at $p < 0.01$ (two-tailed).

The new dimension, multicultural workplace, was of interest in investigating perceptions of and attitudes towards the multicultural work environment. Positive responses are indicative of a positive environment benefiting from the multicultural workforce. On the other hand, negative scores on the dimension are indicative of an environment that is negatively affected by the multicultural workforce. In the latter environment, patient safety could be affected negatively by the presence of the multicultural workforce. Table 5.10 provides a summary of the new dimension's items and other items that were not part of any dimension.

Table 5.10: New dimension's items and other new items

Item #	Item description	% missing	Mean (SD)	% agreement (Range) [^]	% disagreement (Range) [§]
Multicultural workplace (3 items) $\bar{x} = 3.6$, SD = 0.96					
18	Working with personnel from different cultures does not reduce the quality of communication. *	0.5	3.16 (1.23)	49 (40–59)	36 (30–39)
19	I do not find it difficult to work with employees of the opposite gender. *	0.3	3.87 (1.07)	75 (60–79)	13 (8–23)
20	I do not find it difficult to work with employees from another culture. *	0.5	3.76 (1.13)	72 (63–77)	16 (6–23)
Other items that were not part of any dimension (5 items)					
24	New policies are well communicated to the staff.	0.3	3.67 (1.02)	68 (58–80)	17 (9–26)
30	I have to work consecutive night shifts.	1.2	3.24 (1.18)	49 (39–54)	29 (26–38)
32	I find it as easy to treat patients of the opposite gender as patients from my gender.	0.6	3.37 (1.25)	54 (29–75)	29 (15–47)
33	I find it as easy to treat patients from another culture as patients from my culture.	0.6	3.39 (1.24)	56 (29–81)	29 (11–50)
38	Patients here disclose important medical information to the treating professionals.*	1.4	2.79 (1.01)	25 (16–28)	41 (30–63)

Note: Likert scale values (strongly disagree = 1; disagree = 2; neutral = 3; agree = 4 and strongly agree = 5).

(% missing = percentage of missing values on corresponding item). (% agreement = percentage of agree and strongly agree responses from the total responses). (% disagreement = percentage of strongly disagree and disagree responses from the total responses).

* Originally negatively worded questions, presented here after being reworded and recoded where a higher mean indicates a more positive response.

[^] The range of the lowest and the highest percentage agreement by operating department.

[§] The range of the lowest and the highest percentage disagreement by operating department.

5.5. Items and dimensions of the safety climate

The mean was calculated and presented with the standard deviation (SD) for each item and dimension based on participants' average scores (Table 5.11). The percentages of positive responses (i.e., agree and strongly agree) and negative responses (i.e., strongly disagree and disagree) for each item are presented in the same table. In addition, the lowest and highest percentage of agreement and disagreement by site are presented.

Table 5.11 shows the variation in the presented results. The lowest mean is found for the statement “hospital management does not knowingly compromise the safety of patients” (item #7; $\bar{x} = 3.06$, $SD = 1.22$). The highest mean is for item #1 (“I like my job”), with a mean of 4.5 ($SD = 0.68$). Table 5.11 also shows the percentage of missing responses for each item; these ranged from 0.2% and 1.4% of the total responses.

The means for the dimensions range between 3.3 and 4.0 (Table 5.11). The highest mean is for job satisfaction ($\bar{x} = 4.00$, $SD = 0.64$) and the lowest for perception of management ($\bar{x} = 3.32$, $SD = 0.7$). For each dimension, the percentage of respondents with means ≥ 4 (out of 5) were calculated for each operating department and are presented in Figure 8. The greatest variation between sites is found in the stress recognition dimension (27%–68%), followed by the working conditions dimension (29%–54%). The lowest variations are in the safety climate (19%–36%) and perception of management dimensions (14%–31%). Teamwork climate (29%–57%), job satisfaction (48%–71%) and multicultural workplace (42%–60%) also show variations between the clinical sites.

Table 5.11: Original scale items

Item #	Item description	% missing	Mean (SD)	% agreement (Range) [^]	% disagreement (Range) ^{\$}
Teamwork climate (6 items) \bar{X} = 3.72, SD = 0.64					
16	Nurse input about patient care is well received in this OR [operating room].	1.2	3.84 (0.84)	74 (58–85)	7 (4–14)
17	The physicians and nurses here work together as a well-coordinated team.	1.2	3.86 (0.95)	75 (65–84)	10 (6–17)
21	In this OR, it is not difficult to speak up if I perceived a problem with patient care. *	1.2	3.34 (1.15)	58 (52–64)	27 (18–38)
34	Disagreements in this OR are resolved appropriately (i.e., not who is right, but what is best for the patient).	0.9	3.69 (1.01)	67 (58–84)	13 (8–15)
35	I have the support I need from other personnel to care for patients.	0.3	3.77 (0.84)	72 (64–81)	9 (3–12)
36	It is easy for personnel in this OR to ask questions when there is something that they do not understand.	0.2	3.81 (0.85)	73 (65–87)	8 (4–12)
Safety climate (7 items) \bar{X} = 3.62, SD = 0.6					
10	I would feel safe being treated here as a patient.	1.4	3.57 (1.07)	62 (35–75)	15 (9–43)
11	Medical errors are handled appropriately in this OR.	0.5	3.85 (0.94)	74 (57–87)	9 (4–19)
12	I am encouraged by my colleagues to report any patient safety concerns I may have.	0.3	3.87 (0.91)	76 (67–84)	9 (6–12)
13	In this OR, it is not difficult to discuss errors. *	0.8	3.13 (1.14)	43 (32–55)	31 (24–37)
14	The culture in this OR makes it easy to learn from the errors of others.	1.1	3.59 (0.89)	63 (60–70)	13 (3–16)
15	I know the proper channels to direct questions regarding patient safety in this OR.	0.6	3.76 (0.9)	71 (61–82)	10 (6–14)
22	I receive appropriate feedback about my performance.	0.6	3.53 (1.03)	64 (56–81)	18 (5–25)
Job satisfaction (5 items) \bar{X} = 4, SD = 0.64					
1	I like my job.	0.6	4.54 (0.68)	94 (91–95)	2 (1–4)
2	This hospital is a good place to work.	0.9	4.0 (0.91)	79 (62–87)	7 (3–30)
5	Working in this hospital is like being part of a large family.	0.8	3.77 (1.0)	69 (64–72)	13 (8–18)
9	I am proud to work at this hospital.	1.2	3.98 (0.96)	76 (51–84)	8 (3–32)
37	Morale in this OR is high.	0.5	3.73 (0.93)	69 (64–72)	11 (8–22)
Stress recognition (4 items) \bar{X} = 3.5, SD = 0.95					
27	When my workload becomes excessive, my performance is impaired.	0.5	3.56 (1.16)	61 (47–87)	23 (12–31)
28	Fatigue impairs my performance during emergency situations.	0.2	3.44 (1.18)	59 (44–84)	26 (14–38)
29	I am less effective at work when fatigued.	1.2	3.57 (1.11)	64 (46–84)	22 (11–32)
31	I am more likely to make errors in tense or hostile situations.	2.0	3.43 (1.23)	57 (38–78)	28 (14–41)
Working conditions (4 items) \bar{X} = 3.6, SD = 0.77					
3	This hospital does a good job of training new personnel.	1.1	3.69 (1.07)	65 (46–77)	15 (3–29)
4	Trainees in my discipline are adequately supervised.	0.9	3.63 (1.05)	65 (50–81)	16 (4–30)
8	This hospital constructively deals with problem physicians and employees.	1.4	3.17 (1.07)	41 (32–49)	25 (14–32)
25	All the necessary information is available before the start of a procedure.	0.8	3.89 (0.9)	78 (70–83)	10 (7–13)
Perception of management (4 items) \bar{X} = 3.32, SD = 0.7					
6	Hospital management supports my daily efforts	0.2	3.39 (1.08)	51 (38–58)	22 (15–41)
7	Hospital management does not knowingly compromise the safety of patients.	1.5	3.06 (1.22)	39 (26–49)	36 (30–41)
23	I am provided with adequate, timely information about events in the hospital that might affect my work.	0.5	3.41 (1.04)	57 (44–70)	21 (11–33)
26	The levels of staffing in this OR are sufficient to handle the number of patients.	0.6	3.43 (1.18)	62 (30–72)	26 (16–62)

Note: Likert scale values (strongly disagree = 1; disagree = 2; neutral = 3; agree = 4 and strongly agree = 5). (% missing = percentage of missing values on corresponding item). (% agreement = percentage of agree and strongly agree responses from the total responses). (% disagreement = percentage of strongly disagree and disagree responses from the total responses).
 * Originally negatively worded questions that are presented here after been reworded and recoded where a higher mean indicates a more positive response.
[^] The range of the lowest and the highest percentage agreement by operating department.
^{\$} The range of the lowest and the highest percentage disagreement by operating department.
 OR refers to Operating Rooms

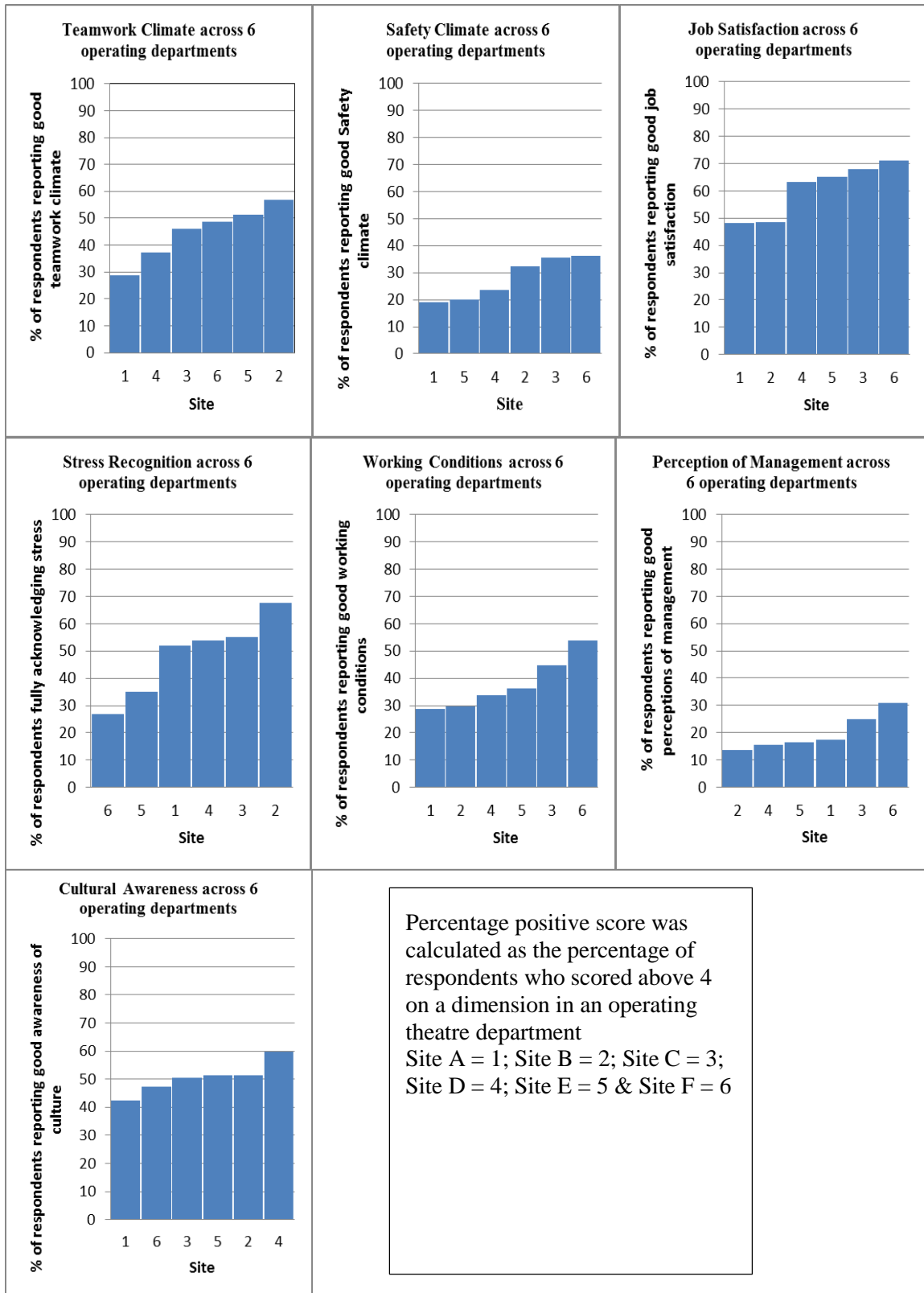


Figure 8: Percentages of positive scores across the six operating theatre departments

Diverse results were also obtained from the remaining five new items (Table 5.10). The highest mean ($\bar{x} = 3.67$, $SD = 1.02$) is found on statement #24, “new policies are well communicated to the staff”. Most respondents agreed with that statement (68%, range by clinical place = 58%–80%). The lowest mean ($\bar{x} = 2.79$, $SD = 1.01$) is found on statement #38, “patients here disclose important medical information to the treating professionals”. Forty-one per cent of participants disagreed with this statement compared to only 25% who were in agreement. This statement has the highest percentage of missing responses ($n = 9$, 1.4%) among the new items (range = 0.3%–1.4%).

5.6. Inferential statistics for each dimension

Each dimension was subjected to univariable analysis to explore significant differences between groups. Two tailed t-tests were used for independent variables with two levels (i.e. gender and language used to answer the questionnaire). One way analysis of variance (ANOVA) was used for independent variables with more than two variables; that is site (6 sites), age (4 groups), profession (4 groups), nationality (3 groups) and tenure (5 groups). Tukey HSD post-hoc test was used to identify the groups of significance differences. After that, backward stepwise multiple regressions were used to test which independent variables significantly predicted the investigated dimensions. The same independent variables (with significance value of < 0.15) were included in the multiple regressions. The results for each dimension are presented separately.

5.6.1. Teamwork climate

Univariable analysis for teamwork climate shows significant difference between sites ($F(5,643) = 2.90$; $p = 0.014$) and age groups ($F(3,639) = 4.36$; $p = 0.005$) (Table 5.12). Higher means for teamwork climate indicates a more positive perception of the quality of teamwork and collaboration between professionals within that operating department, and vice versa. Tukey’s HSD [honest significant difference] post-hoc tests

indicate that the teamwork mean in site D is statistically lower than the mean from site F, and that the youngest group of respondents (aged 18–29) have a statistically lower mean than respondents in the two oldest groups (i.e., older than 40).

The backward stepwise regression shown that site, profession and age of the respondents are significantly predicting about 6% of the teamwork climate ($R^2 = 0.058$, $F(9,629) = 4028$, $p < 0.001$) (Table 5.13).

Table 5.12: Univariable results for teamwork climate dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.56 (.65)	$F(5,643) = 2.9$.014
	B	37	3.82 (.68)		
	C	87	3.75 (.68)		
	D	169	3.60 (.64) _a		
	E	80	3.78 (.65)		
	F	224	3.79 (.61) _a		
Profession	Surgeons	207	3.71 (.61)	$F(3,636) = 1.83$.141
	Anaesthetists	49	3.85 (.6)		
	Nurses	316	3.67 (.65)		
	Anaesthesia technicians	68	3.82 (.68)		
Gender*	Male	300	3.76 (.67)	$t(643) = 1.48$.138
	Female	345	3.68 (.61)		
Nationality	Saudi	191	3.64 (.71)	$F(2,613) = 2.75$.065
	Arabic	161	3.80 (.55)		
	Non-Arabic	264	3.73 (.63)		
Age	18–29	182	3.61 (.67) _{a,B}	$F(3,639) = 4.36$.005
	30–39	226	3.69 (.67)		
	40–49	140	3.79 (.61) _a		
	50+	95	3.87 (.52) _B		
Tenure	<1	122	3.71 (.59)	$F(4,636) = 2.06$.084
	1–3	193	3.68 (.68)		
	4–6	152	3.69 (.69)		
	7–9	96	3.84 (.59)		
	10+	78	3.81 (.55)		
Language used to answer*	Arabic	267	3.71 (.65)	$t(620) = -0.29$.771
	English	355	3.73 (.64)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.13: Final regression model for teamwork climate dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	-.031	.100	-.013	-.312	.755
Site B	.239	.115	.087	2.083	.038
Site C	.176	.083	.094	2.113	.035
Site E	.192	.086	.099	2.248	.025
Site F	.249	.068	.184	3.692	< .001
Nurses	.000	.000			
Surgeons	.040	.061	.029	.662	.508
Anaesthetists	.094	.099	.039	.956	.339
Anaesthesia techs	.188	.085	.090	2.224	.027
Age	.101	.026	.162	3.966	< .001

Note: * $p < 0.05$; ** $p < 0.01$; $R^2 = 0.058$, Adjusted R = 0.044, $p < 0.001$

5.6.2. Safety climate

Safety climate means are statistically different based on almost all independent variables (Table 5.14). The one-way analysis of variance (ANOVA) shows that means are statistically significantly different based on respondent's site, profession, nationality, age and tenure. Higher means on safety climate indicates a more positive perception of a strong and proactive organisational commitment to safety, and vice versa. The post-hoc test shows that the safety climate mean at site F is significantly higher than at sites A and D. In addition, the mean at site C is significantly higher than at site D. With regard to respondents' professions and safety climate, the post-hoc test shows nurses higher than surgeons, and the Saudi respondents' mean greater than that of non-Arabic respondents. It is also evident in the post-hoc results that younger respondents have significantly lower scores. Similar results are found when results are classified based on tenure: respondents with fewer than three years of experience in the same operating department score lower than those with more than seven years.

Table 5.14: Univariable results for safety climate dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.49 (.62) _a	$F(5,643) = 5.59$	< .001
	B	37	3.57 (.64)		
	C	87	3.69 (.59) _b		
	D	169	3.46 (.65) _{b,C}		
	E	80	3.58 (.55)		
	F	224	3.75 (.52) _{a,C}		
Profession	Surgeons	207	3.51 (.61) _a	$F(3,636) = 4.44$.004
	Anaesthetists	49	3.75 (.50)		
	Nurses	316	3.62 (.58)		
	Anaesthesia technicians	68	3.76 (.61) _a		
Gender*	Male	300	3.60 (.60)	$t(643) = -.447$.655
	Female	345	3.62 (.59)		
Nationality	Saudi	191	3.51 (.69) _a	$F(2,535) = 4.42$.013
	Arabic	161	3.65 (.50)		
	Non-Arabic	264	3.67 (.57) _a		
Age	18–29	182	3.48 (.59) _{A,B}	$F(3,610) = 7.31$	< .001
	30–39	226	3.59 (.63) _C		
	40–49	140	3.70 (.59) _A		
	50+	95	3.79 (.43) _{B,C}		
Tenure	<1	122	3.53 (.58) _{a,b}	$F(4,636) = 4.91$.001
	1–3	193	3.54 (.60) _{c,d}		
	4–6	152	3.58 (.59)		
	7–9	96	3.78 (.62) _{a,c}		
	10+	78	3.78 (.52) _{b,d}		
Language used to answer*	Arabic	267	3.61 (.59)	$t(620) = -.43$.664
	English	355	3.63 (.61)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

The backward stepwise regressions show that the site, profession and age significantly predict about 11% of the safety climate dimension ($R^2 = 0.106$, $F(9,629) = 8.253$, $p < 0.001$) (Table 5.15).

Table 5.15: Final regression model for safety climate dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	.013	.090	.006	.148	.883
Site B	.095	.103	.038	.924	.356
Site C	.263	.075	.152	3.486	.001
Site E	.118	.077	.066	1.524	.128
Site F	.286	.061	.228	4.694	< .001
Nurses	.000	.000			
Surgeons	.030	.089	.013	.337	.736
Anaesthetists	-.128	.055	-.101	-2.333	.020
Anaesthesia technicians	.195	.076	.101	2.561	.011
Age	.135	.023	.232	5.846	< .001

5.6.3. Job satisfaction

Univariable analysis for job satisfaction dimension shows that there are statistically different means based on respondents' worksites, nationality, age and tenure (Table 5.16). Higher means on the job satisfaction dimension indicates a more positive perception of work experience at that particular operating department, and vice versa. Tukey's HSD post-hoc analysis indicates that site F has a statistically significantly higher mean than sites A or B. In addition, it shows that Saudis respond statistically lower on job satisfaction than the other two groups.

Respondents younger than 29 respond statistically differently than respondents older than 40. Only the means of respondents with one to three years of tenure are statistically different from the means of respondents with more than seven years of tenure.

Table 5.17 presents backward stepwise regressions showing that site and age significantly predict about 7% of the dimension ($R^2 = 0.065$, $F(6,636) = 7.39$, $p < 0.001$)

Table 5.16: Univariable results for job satisfaction dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.76 (.65) _A	$F(5,643) = 4.40$.001
	B	37	3.74 (.84) _B		
	C	87	4.00 (.69)		
	D	169	4.00 (.58)		
	E	80	3.97 (.63)		
	F	224	4.12 (.59) _{A,B}		
Profession	Surgeons	207	3.99 (.60)	$F(3,636) = .32$.813
	Anaesthetists	49	4.06 (.61)		
	Nurses	316	3.99 (.65)		
	Anaesthesia technicians	68	4.04 (.74)		
Gender*	Male	300	3.99 (.65)	$t(643) = -.361$.718
	Female	345	4.01 (.63)		
Nationality	Saudi	191	3.88 (.73) _{A,b}	$F(2,535) = 5.76$.003
	Arabic	161	4.10 (.58) _A		
	Non-Arabic	264	4.05 (.59) _b		
Age	18–29	182	3.88 (.71) _{A,B}	$F(3,605) = 6.08$	<.001
	30–39	226	3.98 (.64)		
	40–49	140	4.12 (.59) _A		
	50+	95	4.14 (.48) _B		
Tenure	<1	122	3.95 (.65)	$F(4,597) = 4.39$.002
	1–3	193	3.91 (.65) _{a,b}		
	4–6	152	3.40 (.69)		
	7–9	96	4.17 (.60) _a		
	10+	78	4.17 (.49) _b		
Language used to answer*	Arabic	267	3.98 (.66)	$t(620) = -.755$.451
	English	355	4.02 (.61)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.17: Final regression model for job satisfaction dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	-.246	.098	-.105	-2.500	.013
Site B	-.247	.112	-.090	-2.197	.028
Site C	.007	.082	.004	.080	.936
Site E	-.030	.084	-.015	-.354	.723
Site F	.157	.064	.118	2.468	.014
Age	.111	.024	.177	4.580	<.001

Note: R² = 0.065; Adjusted R² = 0.056; $p < 0.001$

5.6.4. Stress recognition

Stress recognition means were statistically different based on the respondent's site, profession, gender and nationality (Table 5.18). In addition, respondents who indicated that they had answered the English version of the questionnaire had statistically significantly lower means on the stress recognition dimension than those who indicated that they had answered the Arabic version.

Higher means on the stress recognition dimension indicate more acknowledgement of the effect of stress on people's performance and concentration. Post-hoc tests indicate that the means of respondents from site F were statistically lower than those from all other sites. Nurses responded statistically lower than all other professional groups. The means of non-Arabic respondents were statistically lower than the means of respondents of Arabic nationalities.

Multiple regression analysis shows that site, nationality and gender of respondents are the significant predictors of the stress recognition dimension (Table 5.19). Backward stepwise regressions show that the three independent variables can significantly predict 20% of the stress recognition's score ($R^2 = 0.201$, $F(8,607) = 19.05$, $p < 0.001$).

Table 5.18: Univariable results for stress recognition dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.61 (.99) _a	$F(5,405) = 12.25$	< .001
	B	37	4.02 (.73) _B		
	C	87	3.69 (.97) _C		
	D	169	3.70 (.81) _D		
	E	80	3.51 (.77) _f		
	F	224	3.16 (1.01) _{a,B,C,D,f}		
Profession	Surgeons	207	3.84 (.79) _A	$F(3,269) = 24.00$	< .001
	Anaesthetists	49	3.79 (.86) _B		
	Nurses	316	3.21 (.95) _{A,B,C}		
	Anaesthesia technicians	68	3.69 (.95) _C		
Gender*	Male	300	3.84 (.83)	$t(643) = 9.18$	< .001
	Female	345	3.21 (.94)		
Nationality	Saudi	191	3.80 (.87) _A	$F(2,613) = 62.97$	< .001
	Arabic	161	3.88 (.78) _B		
	Non-Arabic	264	3.06 (.89) _{A,B}		
Age	18–29	182	3.40 (1.06)	$F(3,572) = 2.42$.065
	30–39	226	3.47 (.91)		
	40–49	140	3.66 (.88)		
	50+	95	3.51 (.84)		
Tenure	<1	122	3.63 (.94)	$F(4,636) = .96$.429
	1–3	193	3.43 (.99)		
	4–6	152	3.50 (.96)		
	7–9	96	3.45 (.90)		
	10+	78	3.53 (.82)		
Language used to answer*	Arabic	267	3.85 (.84)	$t(620) = 8.26$	< .001
	English	355	3.26 (.93)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.19: Final regression model for stress recognition dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	-.140	.137	-.041	-1.020	.308
Site B	.175	.160	.042	1.089	.277
Site C	.011	.115	.004	.098	.922
Site E	-.019	.119	-.007	-.157	.875
Site F	-.226	.096	-.114	-2.344	.019
Saudi nationals	.000	.000			
Arabic nationals	.085	.091	.040	.936	.350
Non-Arabic nationals	-.471	.101	-.249	-4.672	< .001
Male respondents	.294	.087	.156	3.377	.001

Note: $R^2 = 0.201$, Adjusted $R^2 = 0.190$, $p < 0.001$

5.6.5. Working conditions

The means of the working conditions dimension are statistically different based on the respondent's site, profession and nationality (Table 5.20). Higher means indicates a more positive perception of the quality of the work environment. Tukey's HSD post-hoc test indicates that respondents from site F have means statistically higher than those from other sites, except site C. Similarly, respondents from non-Arabic nationalities have higher means than Saudis. Anaesthesia technicians had statistically higher means than surgeons.

Table 5.20: Univariable results for working conditions dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.38 (.75) _A	$F(5,295) = 8.40$	< .001
	B	37	3.35 (.94) _B		
	C	87	3.64 (.74)		
	D	169	3.44 (.86) _C		
	E	80	3.44 (.73) _D		
	F	224	3.86 (.59) _{A,B,C,D}		
Profession	Surgeons	207	3.47 (.74) _A	$F(3,636) = 4.22$.006
	Anaesthetists	49	3.65 (.75)		
	Nurses	316	3.61 (.75)		
	Anaesthesia technicians	68	3.84 (.85) _A		
Gender*	Male	300	3.58 (.79)	$t(643) = -.461$.645
	Female	345	3.61 (.74)		
Nationality	Saudi	191	3.48 (.89) _a	$F(2,522) = 3.90$.021
	Arabic	161	3.61 (.72)		
	Non-Arabic	264	3.69 (.69) _a		
Age	18–29	182	3.52 (.80)	$F(3,594) = 2.22$.085
	30–39	226	3.56 (.78)		
	40–49	140	3.66 (.78)		
	50+	95	3.73 (.62)		
Tenure	<1	122	3.62 (.81)	$F(4,636) = 1.12$.346
	1–3	193	3.53 (.77)		
	4–6	152	3.57 (.78)		
	7–9	96	3.69 (.74)		
	10+	78	3.68 (.69)		
Language used to answer*	Arabic	267	3.58 (.83)	$t(531) = -.57$.571
	English	355	3.61 (.73)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Multiple regression analysis indicates that respondent's site, profession and age are significant predictors of the working conditions dimension (Table 5.21). Backward stepwise regressions show that these three independent variables can statistically predict about 11% of the working conditions dimension ($R^2 = 0.106$, $F(9,629) = 8.27$, $p < 0.001$).

Table 5.21: Final regression model for working conditions dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	-.052	.116	-.019	-.451	.652
Site B	-.090	.133	-.027	-.675	.500
Site C	.245	.097	.110	2.521	.012
Site E	.017	.099	.007	.169	.866
Site F	.437	.079	.270	5.565	< .001
Nurses	.000	.000			
Surgeons	-.086	.071	-.053	-1.218	.224
Anaesthetists	-.035	.115	-.012	-.307	.759
Anaesthesia technicians	.301	.098	.121	3.068	.002
Age	.119	.030	.159	4.012	< .001

Note: $R^2 = 0.106$; Adjusted $R^2 = 0.093$; $p < 0.001$

5.6.6. Perception of management

The means of the perception of management dimension are statistically different based on the respondent's sites and nationality (Table 5.22); higher means indicate more positive views of the appropriateness of management's actions regarding safety issues.

Respondents from site F have higher means for the perception of management dimension than respondents from all other sites except site C. Similarly, non-Arabic respondents have a higher mean for perception of management than respondents from Arabic nationalities.

Results of multiple regression analysis show that only site and age of respondents are significant predictors of the perception of management dimension (Table 5.23).

Backward stepwise regression shows that site and age can statistically predict about 7% of this dimension ($R^2 = 0.073$, $F(6,636) = 8.64$, $p < 0.001$).

Table 5.22: Univariable results for perception of management dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.14 (.77) _A	$F(5,643) = 8.08$	<.001
	B	37	3.04 (.75) _B		
	C	87	3.32 (.76)		
	D	169	3.26 (.65) _C		
	E	80	3.12 (.69) _D		
	F	224	3.53 (.63) _{A,B,C,D}		
Profession	Surgeons	207	3.24 (.66)	$F(3,636) = 1.54$.203
	Anaesthetists	49	3.34 (.61)		
	Nurses	316	3.35 (.71)		
	Anaesthesia technicians	68	3.42 (.81)		
Gender*	Male	300	3.32 (.70)	$t(643) = -.182$.856
	Female	345	3.33 (.70)		
Nationality	Saudi	191	3.25 (.73) _a	$F(2,613) = 5.06$.007
	Arabic	161	3.25 (.65) _b		
	Non-Arabic	264	3.43 (.70) _{a,b}		
Age	18–29	182	3.26 (.71)	$F(3,639) = 2.43$.064
	30–39	226	3.27 (.65)		
	40–49	140	3.43 (.75)		
	50+	95	3.40 (.69)		
Tenure	<1	122	3.35 (.62)	$F(4,636) = .18$.949
	1–3	193	3.32 (.70)		
	4–6	152	3.30 (.77)		
	7–9	96	3.35 (.66)		
	10+	78	3.30 (.72)		
Language used to answer*	Arabic	267	3.25 (.72)	$t(620) = -1.92$.055
	English	355	3.36 (.68)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.23: Final regression model for the perception of management dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	-.129	.107	-.050	-1.201	.230
Site B	-.210	.123	-.070	-1.710	.088
Site C	.056	.089	.028	.628	.530
Site E	-.155	.092	-.073	-1.681	.093
Site F	.292	.070	.199	4.182	< .001
Age	.083	.026	.120	3.124	.002

Note: $R^2 = 0.073$; Adjusted $R^2 = 0.064$; $p < 0.001$

5.6.7. Multicultural workplace

Statistically different means are evident when the results of the multicultural workplace dimension are classified based on respondent's profession (Table 5.24). Nurses have statistically lower means than surgeons and anaesthetists; higher means indicated a more positive perception of the multicultural working environment.

Although profession is the only independent variable with statistical significance of < 0.05 on univariable analysis, the results of multiple regression analysis show that site, profession and gender of respondents are significant predictors of the multicultural workplace dimension (Table 5.25). The backward stepwise regression shows that these three independent variables predict about 7% of the multicultural workplace dimension ($R^2 = 0.067$, $F(9,630) = 5.06$, $p < 0.001$).

Table 5.24: Univariable results for multicultural workplace dimension

IV	Groups	N	Mean (SD)	Statistics	Sig.
Site	A	52	3.40 (1.22)	F (5, 335) = 1.67	.141
	B	37	3.66 (.87)		
	C	87	3.38 (1.15)		
	D	169	3.66 (.94)		
	E	80	3.72 (.85)		
	F	224	3.63 (.87)		
Profession	Surgeons	207	3.80 (.86) _A	F (3,354) = 7.72	< .001
	Anaesthetists	49	3.83 (.75) _B		
	Nurses	316	3.42 (.98) _{A,B}		
	Anaesthesia technicians	68	3.65 (1.15)		
Gender*	Male	300	3.62 (1.04)	t (591) = .563	.754
	Female	345	3.58 (.89)		
Nationality	Saudi	191	3.63 (1.12)	F (2,502) = .313	.732
	Arabic	161	3.64 (1.00)		
	Non-Arabic	264	3.57 (.82)		
Age	18–29	182	3.56 (.93)	F (3,639) = .177	.912
	30–39	226	3.63 (.92)		
	40–49	140	3.60 (1.04)		
	50+	95	3.61 (1.01)		
Tenure	<1	122	3.65 (.96)	F (4,636) = 1.10	.357
	1–3	193	3.50 (.89)		
	4–6	152	3.62 (1.01)		
	7–9	96	3.57 (1.01)		
	10+	78	3.75 (.96)		
Language used to answer*	Arabic	267	3.52 (1.12)	t (472) = - 1.65	.100
	English	355	3.65 (.83)		

Notes: * indicates using *t*-test instead of ANOVA.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.25: Final regression model for multicultural workplace dimension

Variable	B	SE-B	β	t	Sig.
Site D	.000	.000			
Site A	-.235	.149	-.067	-1.575	.116
Site B	.078	.172	.019	.452	.651
Site C	-.353	.126	-.126	-2.810	.005
Site E	-.002	.131	-.001	-.016	.987
Site F	.053	.102	.026	.521	.602
Nurses	.000	.000			
Surgeons	.596	.104	.290	5.737	< .001
Anaesthetists	.555	.156	.154	3.563	< .001
Anaesthesia technicians	.389	.141	.125	2.763	.006
Male respondents	.263	.099	.136	2.658	.008

Note: $R^2 = 0.067$; Adjusted $R^2 = 0.054$; $p < 0.001$

5.7. Summary

All dimensions of the safety attitude questionnaire, with the exception of perception of management, show good psychometric properties. Five new items were tested for dimensionality, resulting in a three-item dimension about perception of the multicultural work environment. Site was the only independent variable that showed significant prediction for all dimensions. Site, profession, age, gender and nationality were the independent variables that significantly predicted one or more of the dimensions (Table 5.26).

Table 5.26: Significant independent variable predictors of each dimension

	Site	Profession	Gender	Age	Nationality	Language	Tenure	Experience
Teamwork climate	X	X		X				
Safety climate	X	X		X				
Job satisfaction	X			X				
Stress recognition	X		X		X			
Working conditions	X	X		X				
Multicultural workplace	X	X	X					

Site F was more constantly significantly different than other sites, especially site D, in almost all dimensions. Site D was the oldest and site F the newest hospital at the time of data collection. In addition to the level of culture maturity, respondent's age was a predictor of safety culture. In those dimensions where age is a significant predictor, younger professionals respond less positively than older ones. Nurses responded differently on most dimensions where profession is a significant predictor. Non-Arabic nationals respond significantly differently from other nationalities on the dimension where nationality is a significant predictor (i.e., stress recognition).

No statistical differences were found between the responses to the Arabic and English versions of the questionnaire except on the stress recognition dimension. However, that difference is not a significant predictor when multiple regression analysis was conducted. Multiple regression results showed that the effect is more due to the other independent variables. These results indicate the rigorousness of the translation of the questionnaire.

5.8. Quality of communication scale

Respondents were asked to rate the quality of communication that they experienced from surgeons, anaesthetists, operating theatre nurses, anaesthesia technicians, perfusionists, surgical technicians, support staff, ward nurses, recovery personnel and ICU personnel. The rating scale included six options: *very low*, *low*, *adequate*, *high*, *very high* and *not applicable*.

The overall mean of the rating received by each professional group was calculated at the professional group level. The responses were transformed into a 100-point scale so the differences between means would be easier to compare and understand. The transformation took place as follows: “very low” = 0 points, “low” = 25 points, “adequate” = 50 points, “high” = 75 points and “very high” = 100 points.

The mean rating each professional group received from all respondents is reported collectively (Table 5.27). Operating theatre nurses received the highest mean rating of 74.8, closely followed by surgical technicians ($\bar{x} = 71.1$) and anaesthetists ($\bar{x} = 70.8$). Surgeons, recovery personnel and anaesthesia technicians receive similar means of 68.8, 68.7 and 68.2, respectively. The lowest rating is given to perfusionists, who obtain a mean of 60.8.

Table 5.27: Mean rating each group received

Groups being rated	Number of respondents*	Mean rating 0–100 (SD)	Percentage of “high” and “very high” ratings received
Surgeons	566	68.77 (22.65)	54.4
Anaesthetists	610	70.78 (22.91)	57.4
Nurses	614	74.80 (21.82)	67.9
Anaesthesia techs.	584	68.15 (24.68)	54.3
Perfusionists	249	60.84 (22.06)	41.4
Surgical techs.	502	71.12 (23.53)	59.2
Support staff	483	66.77 (22.62)	51.1
Ward nurses	561	63.68 (21.31)	45.6
Recovery personnel	577	68.67 (22.42)	57.0
ICU personnel	472	62.98 (24.76)	47.1

Note: * indicates the number of respondents who rated that specific professional group

The means of the ratings range between 60 and 75 on a 100-point scale, equivalent to the range “adequate” to “high” quality of communication. This could be interpreted as that there is room and need for improvement in the quality of communication between professionals.

The analysis subsequently investigated whether respondents from the same profession rated their peers differently. The results were reported according to the respondents’ professional groups (i.e., surgeons, anaesthetists, operating theatre nurses and anaesthesia technicians).

Respondents had the opportunity to rate the quality of communication they experienced with their peers in their profession as well as professionals from other groups. When data were aggregated at the professional level, it was found that each group rated their quality of communication with their peers higher than the quality of communication with other groups (Table 5.28). The quality of communication among each group of

professionals was perceived by respondents to be higher than the quality of communication with members of other groups.

Table 5.28: Mean rating given by each group of professionals (in left column) to other groups

Professionals who performed the rating	Professional group being rated			
	Surgeons	Anaesthetists	Operating theatre nurses	Anaesthesia technicians
Surgeons	78.61 (n = 173)	73.07 (n = 194)	77.54 (n = 197)	69.86 (n = 175)
Anaesthetists	76.09 (n = 46)	82.93 (n = 41)	78.41 (n = 44)	82.41 (n = 46)
Operating theatre nurses	60.7 (n = 278)	63.95 (n = 301)	71.17 (n = 300)	60.32 (n = 293)
Anaesthesia technicians	73.77 (n = 61)	90 (n = 65)	82.03 (n = 64)	91.27 (n = 63)
Overall mean of rating	68.77 (n = 566)*	70.78 (n = 610)*	74.8 (n = 614)*	68.15 (n = 584)*

Notes: * The total number is different from the sum of all groups due to missing values in “profession”.

Bolded numbers indicate the highest mean respondents from the left column gave to the rated professions.

Although intra-profession rating was higher than inter-profession in each group, the rating each group received from other non-peer groups was explored, and different results were obtained. The mean rating each group of professionals received is lower when excluding their peers’ ratings, except for operating theatre nurses (Table 5.29). Operating theatre nurses rating their fellow operating theatre nurses higher than they rate other professional groups, and receive even higher ratings from all other professional groups. To illustrate, operating theatre nurses rate the quality of communication with their peers higher than with any other group ($\bar{X} = 71.2$), and receive a higher rating from surgeons ($\bar{X} = 77.5$), anaesthetists ($\bar{X} = 78.4$), and anaesthesia technicians ($\bar{X} = 82$) (Table 5.28). This indicates differences between groups’ rating behaviours, with some groups tending to give higher ratings than other groups. Univariable and multivariable tests were performed to understand the rating behaviour of the respondents and the professional groups.

Table 5.29: Mean rating each group received from other groups, including and excluding ratings from their peer professionals from the same group

Group	Mean rating received for each group	
	Including rating from their peers Mean (SD) (n)	Excluding ratings from their peers Mean (SD) (n)
Surgeons	68.77 (22.65) (n = 566)	64.61 (22.44) (n = 385)
Anaesthetists	70.78 (22.91) (n = 610)	70.13(22.97) (n = 560)
Operating theatre nurses	74.80 (21.82) (n = 614)	78.61 (21.73) (n = 305)
Anaesthesia technicians	68.15 (24.68) (n = 584)	65.56 (24.15) (n = 514)

Note: n = the number of respondents included in the analysis

When the difference between inter-profession and intra-profession was observed, a new independent variable was added in the univariable and multivariable tests. The new independent variable was the rating that respondents gave to their colleagues from the same profession. It included the ratings surgeons gave to communication with surgeons, anaesthetists to anaesthetists, nurses to nurses and technicians to technicians. This intra-profession rating would help in understanding the respondents' rating behaviours, and was named *rating behaviour*. Table 5.30 shows that rating behaviour is highly correlated with all dependent variables, the rating each professional group received. Such results indicate that there is a positive and strong relationship between respondents' ratings of communication with colleagues from the same profession and with other professions. In other words, respondents who rated highly the quality of communication with colleagues from their profession tended to rate communication with other professions highly also; and vice versa.

Results of univariable analysis show that the mean ratings of the quality of communication with surgeons are significantly different, based on all tested independent variables (Table 5.31). Only three variables show significant prediction of the ratings when multiple regression analysis is conducted (Table 5.32). Backward stepwise multiple

regressions show that rating behaviour, respondent's profession and language can predict 48% of the ratings ($R^2 = 0.475$, $F(5,521) = 94.287$, $p < 0.001$).

Table 5.30: Pearson's correlation between intra-profession rating and ratings of all professional groups

Independent variable	Surgeons' received ratings	Anaesthetists' received ratings	Nurses' received ratings	Technicians' received ratings
Rating behaviour	.635 ($p < .001$) n = 541	.620 ($p < .001$) n = 561	.754 ($p < .001$) n = 567	.638 ($p < .001$) n = 539

Note: This table reports Pearson product-moment correlation coefficient (two-tailed).

This table shows that respondents who gave their colleagues from the same profession high ratings (intra-profession rating) also gave other professional groups high ratings.

Univariable results for the ratings received by anaesthetists are similar to the results of ratings received by surgeons. The mean ratings of quality of communication with anaesthetists are statistically significantly different based on the categories of all tested independent variables (Table 5.33). The backward stepwise multiple regression test indicates that rating behaviour, respondent's profession and language can predict only about 44% of the ratings ($R^2 = 0.440$, $F(5,541) = 84.970$, $p < 0.001$) (Table 5.34).

Table 5.31: Univariable analysis for rating received by surgeons

IV	Categories	Mean (SD)	Statistics	Sig.
Site*	A (n = 46)	75.00 (22.97) _a	$F(5,560) = 4.828$	< 0.001
	B (n = 32)	70.31 (23.28)		
	C (n = 62)	77.02 (20.89) _{B, d}		
	D (n = 146)	71.06 (23.98) _c		
	E (n = 71)	65.85 (22.85) _d		
	F (n = 209)	64.11 (20.90) _{a, B,}		
Profession*	Surgeons (n = 173)	78.61(20.30) _A	$F(3,554) = 28.810$	<0.001
	Anaesthetists (n = 46)	76.09 (21.70) _B		
	Nurses (n = 278)	60.70 (20.93) _{A,B,C}		
	Technicians (n = 61)	73.77 (24.34) _C		
Gender^	Male (n = 257)	77.92 (21.22)	$t(560) = 9.282$	< 0.001
	Female (n = 305)	61.31 (21.05)		
Language^	Arabic (n = 299)	76.59 (21.37)	$t(542) = 8.967$	< 0.001
	Non-Arabic (n = 245)	60.10 (21.29)		
Age*	< 30 (n = 170)	65.29 (22.62) _A	$F(3,558) = 4.708$	0.003
	30–39 (n = 197)	68.15 (22.10) _b		
	40–49 (n = 120)	70.42 (22.45)		
	50 + (n = 75)	76.67 (23.01) _{A, b}		
Tenure*	< 1 (n = 106)	70.75 (20.84)	$F(4,554) = 3.051$	0.017
	1–3 (n = 172)	64.83 (22.26)		
	4–6 (n = 129)	67.83 (22.36)		
	7–9 (n = 83)	72.89 (22.16)		
	10 + (n = 69)	73.55 (26.04)		

Note: * one-way ANOVA test; ^ independent sample *t*-test.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.32: Multiple regression results for ratings received by surgeons

Variable	B	SE-B	β	t	Sig.
Rating behaviour	15.889	.907	.595	17.510	< .001
Nurses	.000	.000			
Surgeons	9.221	1.980	.188	4.657	< .001
Anaesthetists	5.292	3.006	.061	1.760	.079
Technicians	-2.946	2.833	-.040	-1.040	.299
Arabic speaking	5.195	1.878	.113	2.766	.006

Note: $R^2 = 0.475$, Adjusted $R^2 = 0.470$, $p < 0.001$

Table 5.33: Univariable analysis for rating received by anaesthetists

IV	Categories	Mean (SD)	Statistics	Sig.
Site*	A (n = 48)	71.88 (23.42)	$F(5,560) = 2.227$	0.050
	B (n = 35)	75.71 (21.43)		
	C (n = 84)	76.79 (23.22)		
	D (n = 157)	68.47 (25.18)		
	E (n = 77)	71.75 (22.71)		
	F (n = 209)	68.66 (20.77)		
Profession*	Surgeons (n =194)	73.07 (23.17) _{a, B,C}	$F(3,697) = 33.025$	<0.001
	Anaesthetists (n = 41)	82.93 (19.72) _{a, D}		
	Nurses (n = 301)	63.95 (21.13) _{B, D,E}		
	Technicians (n = 65)	90.00 (17.00) _{C,E}		
Gender^	Male (n = 280)	79.29 (22.49)	$t(604) = 8.887$	< 0.001
	Female (n = 326)	63.65 (20.79)		
Language^	Arabic (n = 336)	78.65 (22.19)	$t(585) = 9.875$	< 0.001
	Non-Arabic (n = 251)	61.16 (19.88)		
Age*	< 30 (n = 170)	66.91 (22.20) _A	$F(3,600) = 6.817$	< 0.001
	30–39 (n = 210)	69.76 (23.12) _B		
	40–49 (n = 136)	71.51 (22.40) _c		
	50 + (n = 88)	80.11 (22.79) _{A, B, c}		
Tenure*	< 1 (n =103)	69.42 (20.69)	$F(4,598) = 3.319$	0.011
	1–3 (n =185)	67.57 (21.70)		
	4–6 (n = 146)	70.38 (23.85)		
	7–9 (n =94)	77.13 (21.89)		
	10 + (n = 75)	74.33 (26.31)		

Note: * one-way ANOVA test; ^ independent sample *t*-test

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.34: Multiple regression results for ratings received by anaesthetists

Variable	B	SE-B	β	t	Sig.
Rating behaviour	14.062	.923	.528	15.233	< .001
Nurses	.000	.000			
Surgeons	-.598	1.980	-.012	-.302	.763
Anaesthetists	8.545	3.004	.098	2.844	.005
Technicians	8.545	2.784	.118	3.069	.002
Arabic speaking	7.790	1.860	.170	4.189	< .001

Note: $R^2 = 0.440$, Adjusted $R^2 = 0.435$, $p < 0.001$

Ratings received by operating theatre nurses differ significantly on all the independent variables except respondent's site and age (Table 5.35). Despite this difference, multiple regression results reveal the same independent variables. Backward stepwise multiple regression analysis indicates that rating behaviour, respondent's profession and language can predict about 58% of the received ratings ($R^2 = 0.577$, $F(5,547) = 149.162$, $p < 0.001$) (Table 5.36).

Table 5.35: Univariable analysis for rating received by nurses

IV	Categories	Mean (SD)	Statistics	Sig.
Site*	A (n = 49)	73.47 (24.16)	$F(5,608) = 0.328$	0.896
	B (n = 35)	71.43 (25.83)		
	C (n = 82)	75.91 (22.72)		
	D (n = 159)	74.21 (23.10)		
	E (n = 79)	75.95 (22.80)		
	F (n= 210)	75.24 (18.78)		
Profession*	Surgeons (n = 197)	77.54 (21.28) _A	$F(3,601) = 6.703$	< 0.001
	Anaesthetists (n = 41)	78.41 (21.29)		
	Nurses (n = 300)	71.17 (21.39) _{A,B}		
	Technicians (n = 64)	82.03 (23.35) _B		
Gender^	Male (n = 282)	79.96 (22.26)	$t(608) = 5.418$	< 0.001
	Female (n = 328)	70.58 (20.49)		
Language^	Arabic (n = 343)	80.10 (21.45)	$t(589) = 6.873$	< 0.001
	Non-Arabic (n = 248)	68.04 (20.48)		
Age*	< 30 (n = 177)	74.29 (22.84)	$F(3,604) = 0.542$	0.653
	30–39 (n = 211)	75.24 (22.23)		
	40–49 (n = 131)	73.66 (20.64)		
	50 + (n = 89)	77.25 (20.86)		
Tenure*	< 1 (n = 113)	75.89 (21.63)	$F(4,602) = 1.393$	0.006
	1–3 (n = 186)	72.45 (22.59)		
	4–6 (n = 141)	74.29 (22.15)		
	7–9 (n = 95)	78.16 (19.72)		
	10 + (n = 72)	77.08 (21.29)		

Note: * one-way ANOVA test; ^ independent sample *t*-test.

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.36: Multiple regression results for ratings received by nurses

Variable	B	SE-B	β	t	Sig.
Rating behaviour	16.010	.994	.546	16.101	< .001
Nurses	.000	.000			
Surgeons	-1.796	2.178	-.032	-.825	.410
Anaesthetists	10.007	3.217	.106	3.111	.002
Technicians	10.769	2.951	.140	3.650	<.001
Arabic speaking	8.911	2.013	.117	4.427	<.001

Note: $R^2 = 0.577$, Adjusted $R^2 = 0.573$, $p < 0.001$

Mean ratings given to the quality of communication with anaesthesia technicians differ significantly based on each independent variable (Table 5.37). However, multiple regression shows similar results as in ratings given to other groups. Backward stepwise multiple regression indicates that rating behaviour, respondent's profession and language can predict 48% of the ratings ($R^2 = 0.484$, $F(5,519) = 97.487$, $p < 0.001$) (Table 5.38).

Consistent results of multivariable analysis are obtained across all the ratings of quality of communication with different professional groups. Rating behaviour, respondent's profession and language are significant predictors of the ratings. Rating behaviour recognises that people differ when they communicate with each other. Some people are positive in nature, which is reflected in their views of and perceptions about their experiences in communicating with others. This independent variable indicates that respondents who view the quality of communication with their colleagues from the same profession positively hold more positive views about communication with other professions as well. In addition to rating behaviour, respondent's profession is a significant predictor of the way the group rates. Generally, the anaesthesia team (anaesthetists and anaesthesia technicians) rated differently from the surgical team (surgeons and nurses). Nurses in particular show different rating behaviour. Finally, a respondent's language

plays a significant role in rating: Arabic-speaking professionals rate the quality of communication with others significantly higher than non-Arabic speakers.

Table 5.37: Univariable analysis for rating received by anaesthesia technicians

IV	Categories	Mean (SD)	Statistics	Sig.
Site*	A (n = 49)	72.96 (23.29)	F (5,578) = 2.567	.026
	B (n = 33)	77.27 (27.50)		
	C (n = 75)	68.67 (20.99)		
	D (n = 148)	67.74 (25.96)		
	E (n = 74)	71.62 (23.89)		
	F (n = 205)	64.39 (24.63)		
Profession*	Surgeons (n = 175)	69.86 (21.32)A, B, C	F (3,573) = 40.502	< .001
	Anaesthetists (n = 46)	82.61 (22.28) A, D		
	Nurses (n = 293)	60.32 (24.35) B, D, E		
	Technicians (n = 63)	91.27 (16.29) C, E		
Gender^	Male (n = 266)	77.54 (22.69)	t (579) = 8.871	< .001
	Female (n = 315)	60.40 (23.63)		
Language^	Arabic (n = 315)	77.22 (21.56)	t (561) = 9.768	< .001
	Non-Arabic (n = 248)	58.17 (24.67)		
Age*	< 30 (n = 169)	68.34 (25.08)	F (3,576) = 2.990	.031
	30–39 (n = 201)	66.17 (25.49)a		
	40–49 (n = 125)	66.60 (22.21)		
	50 + (n = 85)	75.29 (24.85)a		
Tenure*	< 1 (n = 98)	72.96 (22.32)	F (4,573) = 3.647	.006
	1–3 (n = 184)	65.08 (23.67)		
	4–6 (n = 137)	64.96 (26.16)		
	7–9 (n = 90)	74.17 (23.54)		
	10 + (n = 69)	69.20 (26.82)		

Note: * one-way ANOVA test; ^ independent sample t-test

Same subscript letter indicates statistical difference – capital letter ($p < 0.05$); small letters ($p < 0.01$).

Table 5.38: Multiple regression results for ratings received by anaesthesia technicians

Variable	B	SE-B	β	t	Sig.
Rating behaviour	16.010	.994	.546	16.101	< .001
Nurses	.000	.000			
Surgeons	-1.796	2.178	-.032	-.825	.410
Anaesthetists	10.007	3.217	.106	3.111	.002
Technicians	10.769	2.951	.140	3.650	< .001
Arabic speaking	8.911	2.013	.117	4.427	< .001

Note: $R^2 = 0.484$, Adjusted $R^2 = 0.479$, $p < 0.001$

5.9. Results of open-ended questions

Three open-ended questions were included in the questionnaire. The first was about the effect of the local culture on patient safety. The second asked respondents to offer suggestions to improve patients' safety. Finally, respondents were asked if they wanted to add any comments, giving them the chance to express in their own words the issues that they thought important and related to the investigated topic.

Sixty per cent (n = 387) of the respondents answered a minimum of one question of the three. A total of 644 responses were provided, of which 231 responses (35.9%) to the cultural aspect question, 358 responses (55.6%) to the safety improvement question and 55 (8.5%) additional comments. While some positive comments were provided about the need to maintain the existing level of patient safety practice, the majority of comments were about issues that needed improvement, in spite of more than 80% (n = 528) of participants indicating earlier that the overall patient safety in their facility was either good or excellent.

Respondents were given the space to respond to the questions as they wished, so some provided more than one comment for a single question resulting in a total of 842 codes. As the comments were provided and coded in relation to safety, they fell naturally into three major themes (Table 5.39). The first related to issues needing to be addressed at the employee level (253 codes; 30.0%). The second related to issues needing to be improved at the patient level (292 codes; 34.7%). The third related to issues needing to be improved at the hospital level (297 codes; 35.3%). These three themes are the main components of any health care delivery, indicating the breadth of the responses provided. Most of the codes on the first and third themes were from nurses' comments: 178 (70.3%) and 209 (71.6%) respectively. The second theme was mainly composed of codes derived from physicians' comments (231 codes; 79.1%). Despite the majority of comments on a given theme coming from one or two professions, all had similar value in enriching the

data; and within each theme or sub-theme, professionals from different groups and backgrounds raised the same issues. This led to the conclusion that while issues under discussion were more meaningful to a certain group of professionals, they are also still relevant to other health care workers in operating theatres regardless of their background or specialty. One can assume that these issues were more related to concept of safety culture in operating theatres in general, rather than to a certain group or profession.

Table 5.39: Themes and sub-themes from analysis of open-ended responses

Major theme	Sub-theme	Main issues raised in the sub-theme
Issues with health care professionals (254 codes)	Cultural differences' effect on teamwork and communication (181 codes)	Better communication (97 codes) Better teamwork (84 codes)
	Communicating and dealing with patients (73 codes)	Better communication and dealing with patients (40 codes) Need for proper documentation for patients (33 codes)
Issues with health care consumers (292 codes)	Specific national cultural barriers (158 codes)	Gender issues (53 codes) General cultural issues (41 codes)
	Health-related barriers (134 codes)	Low level of health literacy (78 codes) Mistrust of medicine, hospital and the team (56 codes)
Issues within the healthcare system (297 codes)	Working conditions (117 codes)	Better equipment and adequate supply (40 codes) More staff (42 codes) Better system (35 codes)
	Policy and procedures (104 codes)	Strict application of policy and procedures (51 codes) Active safety and quality department (53 codes)
	Education for employees (76 codes)	Need for more education (45 codes) Targeted education (31 codes)

5.9.1. Issues with health care professionals (employees)

This theme discusses the identified issues needing to be improved at the employee level. It is divided into two sub-themes: issues in dealing with other employees, and issues in dealing with patients. The first sub-theme focuses on problems related to teamwork and

communication. Cultural differences were the focus of the issues raised in this sub-theme. The second consists of issues centred on communicating and dealing with patients. Issues identified by respondents and their suggested solutions are both presented.

5.9.1.1. Cultural differences' effect on teamwork and communication

Comments in this sub-theme focused on the need for teamwork and communication improvement. The issue was summarised by the following comment: “there is no good communication or any teamwork; we need good communication and teamwork”. The implication for communication and teamwork was indicated in the comment “we need to solve these problems, communication and teamwork, to avoid risking patient safety”. Anthropological aspects of culture, including the way they been handled, were indicated to affect the quality of teamwork and communication which ultimately affect patient safety negatively.

Differences in cultural backgrounds were linked to problems with teamwork and communication. As health care workers came from different cultures and backgrounds, respondents indicated that “different nationalities are negatively affecting the quality of work”. Some of the comments highlighted that “there is favouritism with no fair treatment to other team members” and that “equality should be improved”. It was also added that “we have a problem that the employees are speaking in their native language at all times”. These comments and similar ones were indicative of the concerns about the effect of different anthropological aspects of culture (i.e. cultural background and the use of native language) on the quality of work environment.

Different comments related the negative cultural effect on the work environment to the way these differences been handled. It was argued that “diverse cultures in the hospital may increase the quality of patient safety if used appropriately not in competition about which culture is best”. It was suggested that “teamwork should be conducted in a

professional manner based on the person's work, not nationality or religion" and that there should be "more cooperation between all nationalities, not only people from the same nationality". It was suggested that "there should be respect" to improve teamwork.

The comments were not specific to cultural differences, but indicated that professional groups needed to exert more effort to cooperate. According to respondents, "there should be more collaboration between nurses, surgeons and anaesthetists in regard to patient safety" and "sticking to common sense behaviour and cooperating between the workers here is the key success point".

Along with cooperation between different groups and departments, communication improvement was needed at all levels. Comments about the need for better communication, such as "we need effective communication between the members of the surgical team in each department and across the departments", were presented. The importance of communication improvement was advocated: "the most important single factor is communication which can elevate the standard of safety". Specific comments about other issues to do with communication were also provided.

Some respondents mentioned the need for "proper communication between the staff and the supervisors", "regular departmental meeting to discuss errors and problems to find solutions" and "the improvement of information dissemination of patient safety and patient information to all team members". Other respondents commented on the current communication process by indicating that "there should be two-way communication between staff and management, not as what we have now, just one-way communication from management to staff leaving them [staff] frustrated and their problems not solved". It was suggested that "listening [better] to the comments of the surgical team, discussing them and trying to solve them would improve everything".

The quality of handovers was another communication issue that was raised. It should be recognised that the word "endorsement" is used in Saudi Arabia instead of

“handover” (Alyamany, 2013). Respondents indicated that “[the] improper endorsement that we have now needs to be fixed”, emphasising the need for “proper endorsement”. It was suggested that this could be improved “by making the endorsement procedures much simpler” while maintaining the importance of “[the] timely and complete handover of pertinent information”. As improvement of communication was identified as an important issue, it was indicated that there were some issues that could contribute to the lack of communication.

Teamwork and communication were important issues raised by the respondents. Their comments covered a wide range of teamwork and communication issues. Significantly, many of the teamwork and communication issues raised could be linked to cultural differences between respondents. There were concerns about the handling of these cultural and linguistic differences which was claimed to be ineffective resulting in negative effect on the work environment.

5.9.1.2. Communicating and dealing with patients

The respondents identified concerns about poor communication and improper dealing with patients as issues that needed to be improved. They indicated that “the lack of communication” and “minimal communication with patients” were issues affecting the safety of patients. They also mentioned the need to “improve effective communication between patients and all members of the surgical team”, indicating the importance of the involvement of all team members. The existence of “improper behaviour towards some patients” and the need to “improve the dealing with patients” were highlighted and expressed by more than one respondent.

Other comments related to this sub-theme focused on the process of explanation and preparation of patients for surgical procedures. Some comments indicated the need for more explanations about surgical procedures for patients. Respondents commented that

“most of the patients are not aware of their rights and they don’t get enough details about their surgeries” and that “patients need more explanation about their procedures”. In addition, comments such as “[the] proper preparation of patients including documentation would reduce the turnaround time and save theatre time” implied some issues with the preparation of patients for their surgical procedures.

According to respondents, communicating and dealing with patients needed to be improved to achieve better care for them. They pointed out that improper preparation of patients wasted employees’ time, which sometimes forced them to work for longer hours to finish their booked patients.

5.9.2. Issues with health care consumers (patients)

The comments relating to patients were divided into two parts: specific national cultural barriers and health-related barriers. The former was more about cultural practices that were seen as hindering the safety of the patients. The latter, on the other hand, was related to Saudi Arabian patients’ health practices and beliefs.

5.9.2.1. Specific national cultural barriers

Saudi Arabian cultural barriers were mainly concerned with: gender segregation, patients’ desire for privacy and language barriers. Gender issues were raised mostly by respondents from non-Arabic backgrounds. They commented on the lack of gender interaction and its effect on the delivery of safe care. The respondents indicated that “the social norms of seclusion”, such as the “limited interaction between male and female”, result in “difficulty when dealing with [patients of] the other gender”. Others noted that “dealing with a patient from the other gender makes a barrier between the doctor and the patient”, and that this barrier affects the delivery of proper assessment and care; they pointed out that “no proper contact [occurs] when taking medical history with other gender patients”. Other comments indicated that some of the patients asked to be cared for by a

provider of the same gender. Respondents' examples included "some patients refuse to be cared for by the opposite gender", "some female patients ask for a no-male operating theatre" and "female staff not attending for male patients, and vice versa". These could be difficult given the skewed gender balance in the professional groups, indicated in the respondents' demographic results.

In addition to gender segregation issues, the respondents described Saudi patients as conservative and seeking a high level of privacy. They indicated that the local culture was based on "too much desire for privacy" and that "people here are so conservative, we have to dig for more information from the patient and use more time for doing that". Such a desire for privacy can affect the quality of the work provided: "[s]ome patients refuse to allow nurses to check them in the holding area before being pushed to the operating room" and "it is not easy to assess female patients when they are covering their faces; difficulty also arises due to reluctance to speak to a male health care provider". Other respondents indicated that "patients feel embarrassed and anxious when we take their cover off before the operation, we cannot operate on a fully covered patient"; they pointed out that it is a common practice to "minimise the exposure to whatever is necessary".

Additionally, most respondents from non-Arabic backgrounds identified the language barrier as an issue affecting proper health care provision. They commented that "[the] language barrier is a big problem" because "not all patients are able to understand English and not all staff are able to speak and understand Arabic". It was pointed out that "the language difference will affect the contact with staff and will affect the patient safety in the OR eventually".

Some respondents suggested that the availability of a translator could help bridge the gap: "[the] appointment of a translator would probably improve the performance of non-Arabic staff". Others felt that "there should be at least some Saudi staff to help in interpreting the patients' needs". Some suggestions were that "we need to improve our

Arabic communication” and the hospital could help by “providing Arabic courses for non-Arabic speaking staff”. This was summarised in one of the comments: “every communication with the patients should be confirmed with an Arabic-speaking person and explanations should be provided in the patients’ dialect to make sure there is no misunderstanding, so the safety can be maintained”.

5.9.2.2. Health-related barriers

The respondents raised two important issues that they claimed affected patient safety and the quality of care provided: the low level of health literacy and mistrust of the medical team. Respondents pointed out a need for more health-related education and awareness programs for the public. They also highlighted the effect of this low level of health literacy on the relationship between health care providers and patients.

According to respondents, “most patients have low medical and health knowledge”; the “lack of medical awareness” results in them “not [being] able to communicate with the patients as required because of their limited medical knowledge”. Other comments highlighted the weaknesses related to a low knowledge of surgical health—namely, “[a] lack of understanding about the surgical process, especially anaesthesia, and their safety issues” because “patients take their information from unqualified people, sometimes from outside the medical field”. Respondents commented that “we should educate the patients about surgical procedures and anaesthesia through leaflets and explanatory instructions” whereas others suggested the “need [for] home education programs”. A “misunderstanding of the rights of the doctor and the rights of the patients” was a related concern for some of the responding doctors.

The majority indicated a need for some sort of education programs for patients, regardless of the methods used to promote health awareness. Some respondents indicated that most patients do not know the importance of their medical history for making a proper

assessment, and this led to patients not fully revealing it: “patients hide some medical information that could be important in diagnosis and treatment”. Respondents identified the “difficulty of getting medical history right because patients hide important information” as a problem that could increase the risk for patients. Some comments were specifically about surgical history, mentioning that “patients [not telling] the treating doctor of other medical problems such as complications from previous surgeries affects patient safety”. Others noted that “patients get treated in different hospitals, so they have files in several hospitals and their medical history is not complete”. Hiding medical history could be seen as one part of the low level of health literacy and could be addressed in educational programs.

The other issue raised was the lack of trust in modern medicine, which led to widespread use of Saudi Arabian traditional medicine. Respondents identified lack of trust as a problem, mentioning “patients not trusting the doctors” and “trust between treating doctor and the patient should be improved”. The lack of trust was attributed by some to “the large number of medical errors and the improper handling by the management”. However, other respondents offered a different reason: “some patients do not believe in the modern medicine and they insist on using the traditional medicine”. They pointed out the effect of traditional medicine in preventing early diagnosis and treatment: “using traditional medicine makes them come [to the hospital] with advanced stages of disease”; in particular, they recommended that “traditional medicine usage for burns and wounds should be changed as it has a serious effect on patient safety”.

The respondents agreed that this lack of trust was evident and resulted in a lack of cooperation from patients, commenting that “patients do not follow medical advice” especially “instructions about operations and post-op[erative] care”. The relationship between patients and health care personnel needs to be improved.

Some health practices and beliefs were seen as interruptions of the provision of complete and safe care for the Saudi Arabian patients. Furthermore, some of the cultural practices, such as gender segregation, were thought to hinder the quality of care provided. Language difference was also advocated to be an additional burden for the non-Arabic speaking professionals.

5.9.3. Issues within the health system (hospitals)

Three main issues were identified at the hospital level: working conditions, policy and procedures, and the need for more education and training. These issues complement each other and help in understanding issues around safety culture in hospitals.

5.9.3.1. Working conditions

Respondents identified issues that were grouped under the working conditions sub-theme. They indicated a shortage of staff, through comments such as “there is not sufficient staff to handle the number of the cases” and “more personnel are needed”. They indicated that the shortage of staff affects patient safety. One respondent stated outright that “we have a very seriously dangerous lack of personnel, it affects patient safety”. Another respondent argued the need for more staff by stating “any goal of patient safety in a hospital, like ours, could be achieved with proper staffing”. Most respondents specified the need for qualified and experienced physicians and nurses, making comments such as “we need more experienced staff” and “[we can improve by] recruiting more trained and highly qualified doctors and nurses”. Some comments specifically advocated recruiting and training local staff: “[w]e need more local staff, so they can stay longer” and “there is a problem with short turnover, the management should recruit more staff and try to make the current staff stay longer; I think more local staff should be recruited”.

In addition to comments about the shortage of staff in operating theatres, respondents pointed out the need for proper instruments and adequate supplies. When

asked what needed to be improved, several indicated the need for newer high-quality equipment. Examples included “supplies and equipment in OR [need to be improved]”, “provide proper equipment”, “high-quality equipment should be provided” and “provide adequate supply of surgical items”. Others pointed out the need for the proper equipment to deliver proper and safe care to patients, stating that “providing the proper equipment will help in finishing the job safer and on time” and “providing all the necessary equipment and instruments for the best care”.

In more general terms relating to working conditions, respondents identified several issues that concerned them. They pointed out the need for a better work environment with less stress. They indicated that they needed “less pressure on surgical team”. This pressure stemmed from long working hours and the number of on-calls each week, evidenced by comments such as “reduce long working hours”, “earlier handover should be considered in long operations” and “we have too many on-call duties in a week; reduce them for each person”. Others indicated that they needed support to cope with the stress: “[we need] supportive management for all staff”, “encouragement for good work” and “creating a friendly environment”. Other comments indicated the importance of financial incentives for the work in operating theatres, stating that “the financial incentives are not good enough for the level of work and effort required”. Some respondents identified the need for a non-punitive system for responding to adverse events: “it should not matter who did wrong, but what was wrong and how it affects patient safety” and “we need to employ the improvement principle not the punishment one”.

The respondents indicated in this sub-theme the stressors they felt could harm patients and might affect their safety. These included a shortage of staff, a lack of proper instruments and adequate supplies, long working hours and frequent on-call duties, a lack of incentives and the lack of a non-punitive system to handle errors. They indicated the

need for support from management to solve these issues and improve the working conditions, which would ultimately improve patient safety.

5.9.3.2. Policy and procedures

Respondents identified some issues with current policy and procedures, their application, and the need for change in the system. Some indicated the need to update policies and procedures, pointing out the need for “more infection control measures in OR”. Others advocated a more active role for the safety department, indicating a need “[to] improve the quality and safety department” or noting “we need periodical reports about our safety performance” and “doing monthly audits”.

Other comments were about specific issues with policy and procedures. The respondents indicated a need for “less paperwork” and “less documentation”. This issue stemmed from the need to repeat the same information in different forms, affecting the quality of care provided for each patient: “[we need to] reduce the paperwork so we can take care of the patient more than writing the same information over and over” and “I find it difficult to find time to look after patients because of the repeated documentation of the same information in different forms; we need documentation only not to repeat everything”.

Despite the need to update policy and procedures, more comments showed concern about their application. Some respondents indicated that “medical and non-medical staff are not compliant to the policy and procedures and standard practice” and “we need strict and complete application of the protocols”. Others pointed out the need to “update and apply policy and procedures; make sure everyone is following them”. Comments like “all members of the health care team should adhere to the policy and procedures, not only the nurses” and “need strict application of protocols, not only by nurses, but all regardless of job, culture and especially nationality” implied the possibility of differences between

professional groups in operating theatres with regard to privilege and authority. This was supported by comments like “all workers should get equal responsibilities” and the accusation that there is “unfairness in duties’ distribution” as well as the suggestion that there should be “more attention to the workload and the assessment of the work”. The combination of the last remark—the unfair distribution of workload—with the problems raised about staff shortages and long working hours could result in high risks for patients. “[We need] respect for the operating theatre’s time by not adding new cases at the end of the day” was an example of how some individual actions (without consulting others) might affect the whole team.

Updating, revising and fairly applying policy and procedures were important issues raised by respondents. They pointed out that patient safety could be affected by some of the policies, such as repeated paperwork, or by the lack of equality in the application of the policy and procedures. The issues raised here may be directly linked to the stressors in the first sub-theme (working conditions). Respondents claimed that proper and fair application of policy and procedures would improve the safety culture in operating theatres.

5.9.3.3. Education for employees

The respondents identified a need for more education and training in general: “continuous education for all personnel” and “more education and training for all staff” through “regular posters and workshops”, “conferences and external training” and “cross-training with other schools and hospitals”. Some of the respondents identified a lack of adequate education specifically about patient safety. They wanted “more education on safety of employees and patients” and “more training and seminars for safety and quality” according to “the latest medical research and evidence-based”. They underscored the importance of “understanding the requirements of the cultural aspects of the local people” and incorporating them into patient safety education. Some non-Arabic staff commented

that “we need more education about the culture and the people”. The respondents expressed their desire for more education and training, especially in the field of patient safety.

Participants in this sub-theme identified their need for more continuous education and training, especially in the field of patient safety. They pointed out the need for some cultural education about their patients in order to provide proper and safe care. They also identified in the other two sub-themes some stressors related to the system in addition to those caused by the policy and procedures. The shortage of staff, supplies and proper instruments combined with long working hours and duties, as well as the improper application of policy and procedures, were the main issues raised that could affect patient safety. The respondents believed they received insufficient incentives to compensate for these stressors.

5.9.4. Summary of open-ended results

Results from the open-ended questions uncovered some important issues that concerned professionals working in operating theatres. Collectively they revealed problems concerning patient safety at all levels: patients, employees and hospital. Anthropological aspects of culture stood out as a major influence of patient safety.

Communication and teamwork were affected by cultural differences among employees. Respondents complained about others using a language that was not understood by other team members, which negatively affected the quality of communication. Concerns were also raised about inappropriate handling of multicultural members of the workforce, who were not given the chance to uncover their full potential. Employees indicated that they were dealt with based on their cultural background, which hampered a positive work environment. Differences between employees and patients were also manifested in difficulties dealing and communicating with their patients.

In addition to stress exerted by working long hours due to shortage of staff in high demanding jobs, inadequate application of policy and procedures was also a source of stress. Respondents complained about the selective enforcement of rules on certain groups of employees such as nurses, but not all. Some respondents voiced concern about the need for a non-punitive safety system in their workplace.

While the majority of comments from nurses were on the first and the last themes, physicians' comments were mainly about issues with local patients. Mistrust of medical teams and low health literacy, along with some cultural issues, were the respondents' main concerns (mainly the physicians). They indicated that some patients did not follow medical teams' instructions, sought traditional medicine over modern medicine, and hid important medical history from the medical teams. It was suggested that health education for the public should be improved.

5.10. Summary of results of first phase

Along with the demographic information, this chapter has presented the analysis of the safety attitude scale, the new dimension, the quality of communication ratings and open-ended comments. Different but consistent results from first phase data were revealed. Nurses were demographically different from other professional groups. Unlike the other responding groups, nurses were predominantly female, and of non-Arabic nationality. They consistently responded differently on most of the scale's dimensions.

Work site was the most consistent significant predictor of all dimensions. Significant differences were detected between respondents from sites D and F, the oldest and newest hospitals at the time of data collection.

Culture was the link between the previous two independent variables. The non-Arabic female-dominated profession, that is, nurses, responded differently than the Arabic male-dominated professions, that is, surgeons, anaesthetists and anaesthesia technicians.

This was also evident in the way that respondents rated the quality of communication with other professional groups, where nurses' rating behaviours were different to those of the other professionals. The language that respondents spoke in their homes was another significant predictor of their rating behaviours. Non-Arabic language-speaking respondents, of whom the majority were nurses, behaved differently than Arabic-speaking professionals. Language can also be linked to another common theme, culture.

Respondents identified culture as an important issue in safety when they indicated their need for more education about the Saudi culture. Teamwork was reported to be negatively affected by the improper handling of the multicultural workforce. Respondents also pointed out the need for better communication between staff and patients, and between staff members. Respondents linked both the lack of proper communication and the lack of understanding of Saudi culture to safety concerns. These concerns were exacerbated by the different stressors in the work environment. Shortage of staff, unavailability of instruments, inadequate supplies, insufficient incentives and long working hours were among the most important concerns raised by respondents.

The second phase, employing critical case sampling (see Section 4.2.2.1), targeted non-Arabic speaking female nurses from site D and site F to get rich information about the influence of culture on safety culture. Female nurses were considered the critical case as they generally responded differently from their counterparts on most dimensions. In addition, ratings of the quality of communication showed that non-Arabic speaking professionals, of whom the majority were nurses, had significantly lower perceptions of the quality of communication with others. Furthermore, nurses' responses in open-ended questions also supported the decision to interview them. The choice of sites was intended to get maximum exposure of respondents. As responses from these sites were significantly different across most of the dimensions, it was assumed that wider representation would be achieved by interviewing participants from both.

Chapter 6: Interview Findings

We need a safety culture to empower people. –Participant 6

This chapter presents the findings of the qualitative phase, which comprises one-on-one semi-structured interviews. This phase was conducted to enhance the understanding of cultural contexts that might affect patient safety. The interviews were conducted with non-Arabic female nurses with a wide range of experiences and backgrounds. A total of 20 interviews were conducted, with 10 participants from each of two hospitals.

6.1. Participants' demographic information

The participants came from different cultures and backgrounds. The majority were from the Philippines (n = 9) and India (n = 7), which matches with the most commonly reported non-Arabic nationalities in the first phase. There were also three South Africans and one Indonesian.

Participants' age and years of experience in Saudi Arabia were diverse. Six participants were younger than 30 and four were aged between 30 and 40. Half the participants were older than 40 (7 between 40 and 49; 3 older than 50). Most had been working in Saudi Arabia for more than seven years at the time of the interviews (8 participants between 7 and 9 years; 6 participants for over 10 years). Four participants had worked for a period of four to six years; only two had worked for fewer than three years.

Such a group with so much experience enriched the data with their reflections on their experiences and perceptions. The data also benefited greatly from the fresh perspective of the younger participants with shorter experiences in Saudi Arabia. The

diversity of age and experience helped achieve a holistic understanding of issues facing non-Arabic female nurses specifically, and operating theatre teams in general.

All participants volunteered to take part in the interviews. They talked openly about their feelings, experiences and views on important ways to improve safety culture. Their willingness and openness to discuss the issues related to safety culture in their clinical workplaces showed the importance of the topic to them. They were passionate about the interview topics and discussed the issues with enthusiasm, sincerely looking for solutions. Despite each participant's unique contribution to the research data, they all had common feelings and similar experiences. These differences and commonalities helped uncover the very important issues presented in the rest of this chapter.

6.2. Findings

The findings presented in this chapter were based on a thematic analysis of the interview transcripts. Patient safety was embedded within each theme and sub-theme, and the influence of the identified issues on patient safety was linked within the thematic structure of the analysis.

The quoted texts were transcribed from spoken English; almost all participants spoke English as a second language. Instead of correcting any grammatical errors, the researcher has maintained the transcripts in their original form in an effort not to distort the original meaning.

Three main themes were extracted from the transcribed text of the interviews (Table 6.1). The first theme, *culture's influence on work environment*, concerned the link between culture and the work environment. Participants talked about the benefits and difficulties of working in a surgical team with health care professionals from different cultural backgrounds. They pointed out the effect of the local culture on their work environment, including their difficulties in taking part in this culture, which led to their

feelings of being foreigners with minimal integration with the locals and the local culture. The effect of culture and cultural background on the work environment, employees and patient safety was evident in participants' descriptions.

Cultural difficulties were also manifested in the second theme, *safety culture and patient safety*, where participants talked about these issues surfacing in their everyday work. They emphasised the importance of teamwork, respect and communication between team members for a better safety culture. They indicated the difficulties they faced in communicating with Arabic-speaking patients when they could not speak the language. They also talked about the issue of being able to speak up when patient safety was compromised.

Participants talked about how health care professionals from different teams and backgrounds work together in surgical teams. The surgical team usually consists of surgeons, anaesthetists, nurses, anaesthesia technicians and sometimes other professionals such as radiographers. Optimally they work as a team, and everyone performs their duties as required until the end of the operation; however, conflicts sometimes arise between professionals for various reasons. The third theme, *conflict in theatres*, introduced the types of conflict that had an impact on the workers, the work, and—ultimately—the safety of patients. It also shed light on the sources of conflict in operating theatres. This theme consisted of five sub-themes that illustrated the conflicts and explored their impact on health care workers and their patients.

Participants talked openly about the issues that affected the safety culture in their workplaces. As mentioned, three main themes were identified from the participants' transcripts. These themes consisted of 14 interrelated and interconnected sub-themes. Themes and sub-themes that are interrelated can be used to understand each other.

Table 6.1: Themes, sub-themes and their illustrations

Theme	Sub-theme	Illustrations
Culture's influence on work environment	Different backgrounds	There are different cultures and we are from different backgrounds, so we will see things differently and do things a little differently (participant 9)
	Local culture	I had like quite a big cultural shock ... Only when I came here did I know that there is another culture, totally different from all the other cultures that I know (participant 6)
	Local culture influencing work environment	This is a male-dominated society. Women don't have much of a say here and most nurses are female and not of this country ... Work is the same as the society (participant 9)
	Being a foreigner	Very lonely situation. The fact that you come to work, you go back to your room, just being alone in that room, your friends circle around you, but there's no loved ones (participant 4)
Safety Culture and patient safety	Teamwork	Between all of us, it goes a very long way for people to understand that we are a team, we work together (participant 6)
	Communicating within teams	It's all for the patient, patient's safety, you need to speak in English. I don't know what I will understand when she speaks in her language (participant 10)
	Communicating with patients	I'm feeling guilty that I don't interact with patients that much, because I don't speak Arabic very well (participant 18)
	Receiving respect Speaking up	Sometimes we (nurses) feel less respected (participant 16) We're not telling [our comments on policies] to the head ... We are afraid also ... maybe they will get angry with us ... We're trying to avoid that we do something wrong. We're just following what they are telling us (participant 20)
Conflict in theatres	Conflict affecting professionals	I actually was traumatised by it ... I wanted to be swallowed by the floor and just to vanish from the world ... I was humiliated really (participant 7)
	Conflict affecting patient safety	(Conflict) affects the patient as well in a way because [when] you become so emotional; you don't know how to handle this (participant 4)
	Sources of conflicts	I know of a surgeon who is forever belittling others, not only nurses, even other surgeons in the theatre. You know, when they are uptight and they are in a situation with a patient, he takes it out on everybody around him (participant 6)
	Handling effect of conflicts	Basically for nursing, we were trained to face all kinds of difficulty in the profession ... we will manage, we will work ... It's part of our life; we accept it and manage it effectively (participant 5)
	Solving vs. resolving	They (the management) will call the surgeon and they will talk to each other but we are not getting any feedback from them ... But still the surgeons were not changing ... Nothing happen ... They have to investigate what was the problem and they have to solve the problem correctly (participant 3)

6.2.1. Culture's influence on work environment

This theme focuses on participants' experiences and perceptions of the effect of culture on their work environment and, ultimately, patient safety. It provides a holistic understanding of participants' entire experiences of being part of the multicultural workforce. It also helps to explain what participants mean by labelling themselves as foreigners and how participants' first impressions of Saudi Arabia shaped their subsequent work experience.

The theme consists of four sub-themes that are related and complement each other to provide a better understanding of the participants' perceptions of the influence of culture on their work. Participants described the multicultural workforce environment in the first sub-theme, *different backgrounds*. They pointed out some benefits of working with colleagues from the same cultural background plus issues when working with others from different backgrounds. Dealing with team members based on cultural background was one important issue raised by participants. The second sub-theme was *local culture*, where participants talked about the differences between their cultures and the Saudi culture. They described the effect of these differences on them and the health care services provided. They also talked about the difficulties they faced in understanding the culture rather than embracing it. They mentioned different ways that helped them to learn about the Saudi culture. In the third sub-theme, *local culture influencing work environment*, participants talked about how the culture was entrenched in the work environment. They raised some issues about the Saudi culture that affected their work environment and suggested some solutions. They noted that Saudi culture was male-dominated, and suggested appointing male Saudi leaders in the nursing field to ensure a better power balance with other fields. These sub-themes complement each other as they collectively describe cultural differences and how nurses learnt about and dealt with the differences, and provided suggestions for improvement.

6.2.1.1. Different backgrounds

The behaviours and actions of people can be misinterpreted or misunderstood by those from different cultures. People engage in common actions and behaviours without thinking, and some actions may have different meanings in other cultures. Participants expressed their feeling of ease and comfort with colleagues from the same culture, when working in a multicultural work environment. They indicated that they did not have to worry about being misunderstood, as they were by colleagues from other cultures. They also raised issues with how management handles cultural differences.

The participants acknowledged differences between cultures and backgrounds. They talked about how these affected their cooperation with each other. They felt that they were misunderstood when they did something they were used to doing, as some actions were wrongly perceived by people from other cultures:

There are different cultures and we are from different backgrounds, so we will see things differently and do things a little differently ... They [people from other backgrounds] confuse arrogance with assertiveness, they don't know the difference. You stand up for what you believe in and they think you are just being arrogant ... you are [just] being assertive (participant 9)

As a result of such misconstrued perceptions, participants felt some discomfort working with people from other backgrounds. They felt more freedom when they worked with people from their own background as they could act more naturally:

Because we worked together in the previous hospital [in our home country] ... There is a freedom to tell them or do anything without them misunderstanding you. (participant 3)

The participants felt that the work environment was divided into groups based on people's cultures and backgrounds. They talked about themselves as part of a cultural

group. One nurse indicated that she felt isolated because there were not many people from her background:

We're only a few here so I feel isolated ... we are a minority here. (participant 4)

Participants indicated that people were dealt with based on their backgrounds. For example, one participant described how people dealt with particular cultural groups. She talked about people from the Philippines, even though she was from another nationality, being dealt with differently:

Filipino female nurses they won't talk back. They would rather keep them quiet. We do understand that ... Filipinos are outnumbered now. (participant 7)

In the previous two examples, the words *minority* and *outnumbered* indicate the presence of a cultural view of health care workers among the workers. This view was evident not only among them: even management perceived, and deal differently with, different nationalities. Participants indicated that people from different countries receive different salaries despite doing the same job:

Nationality wise, we all are working the same, same stress, same position, but different salary by different country ... It makes you depressed. (participant 10)

That health care workers were dealt with based on their cultural background was evident in the participants' words. They indicated that it affected them at different levels.

6.2.1.2. Local culture

On a broader aspect, participants also talked about the difficulties they faced in understanding and adapting to the local culture. They talked about their experiences, feelings and perceptions when they first came to Saudi Arabia, describing their early experience as “cultural shock,” “a challenge” and perceiving the Saudi culture to be “different from our culture”. They identified the most significant differences that they

found difficult to understand as gender separation and the issue of privacy, and noted that they had found Saudi culture to be different from what they had heard before they arrived. They argued that a culture can only be understood when people are exposed to it.

Almost all participants described their first experience of Saudi Arabia as a shock and a challenge. One of the nurses described her experience in detail, indicating her feelings when she arrived:

I had like quite a big cultural shock ... I was, like, taken aback and I couldn't understand exactly what's happening here. Only when I came here did I know that there is another culture, totally different from all the other cultures that I know ... it took me a very long time to actually understand. (participant 6)

Another participant pointed out that Saudi culture was a shock and a challenge at the same time. She had spent eight years in Saudi Arabia at the time of the interview and concluded, “up to now, it has been a real challenge for me to be in Saudi Arabia” (participant 4).

Different challenges were described, but they were summarised by one participant when comparing Saudi culture with her own: “we have difficulties culture wise, language wise, freedom wise; everything” (participant 5).

Several aspects of the Saudi culture were discussed; the most evident manifestation of Saudi culture was gender segregation. Customs relating to dress were the first issue mentioned by participants when they spoke about culture:

The culture was a shock in the sense that I couldn't understand the female thing in Saudi. It was a real shock. We had to cover from head to toe ... I had to respect it by all means, and I am still doing it. (participant 4)

Saudi customs are built around minimal interaction between females and males, except within one's immediate family. Thus, females wear special clothing, called the

abaya, over their normal clothes when they leave home and are in public places. The *abaya* is a black dress, usually made of very light material that goes from the shoulder to the ankle. Women cover their hair with a matching scarf called a *tarha*. Most Saudi women, but not all, cover their faces with a very light cover called a *ghotwa*, *niqab* or *borqa*. Although it is the norm and the law for females to cover their hair and body when in public, covering the face is optional; however, most women prefer to cover their faces. Social norms also dictate that men refrain from staring at females, leading to a lack of eye contact between genders. Participants explained that

It is just that like the Saudi women covering and when you see the culture you know it is other males are not supposed to see them. (participant 9)

I used to see the people's faces when I talk to them, and I look at them eye to eye, so here you have to be more conserved ... we have less eye contact. (participant 18)

Here there are some restrictions for us, males to females and females also to males ... If you are a female, you cannot talk to males ... you want to elaborate more, but you cannot do more because of the restrictions outside [the hospital] ... really, we just talk to them [during work] and after that, no more. (participant 11)

Different ways of learning about Saudi culture were mentioned. Participants pointed out that they learnt about local culture in their orientation program. Most considered the program helpful for learning about different customs and rituals, but some questioned its benefit. They advocated the need to mingle with local people to learn about the essence of the culture:

When we are coming here, there is GSO (General Staff Orientation) and GNO (General Nursing Orientation): they are giving lectures and classes explaining the Saudi culture and customs here. (participant 8)

I think you will not learn from that orientation with only teaching for one class. I think you have to be spending a lot [of time] with patients for you to know the inner, the real thing about this culture ... Once you get to know the patients, you will have a different idea of how or what the culture is. (participant 15)

In this sub-theme, participants described their first impressions of the Saudi culture and the main issues that they found hard to understand in the Saudi culture. Despite efforts that were implemented to help them in understanding the local culture, participants questioned their effectiveness. They argued that they only truly learnt about the culture when they were exposed to it first-hand.

6.2.1.3. Local culture influencing work environment

Cultural differences and expectations create difficulties for non-Saudi professionals. This sub-theme presents the effect of these differences on the work environment, health care workers and patient safety. Participants pointed out that all levels of the work environment were influenced by the culture, commenting on how male status in the culture influenced interactions among team members. They pointed out how it contributed to the lack of proper problem solving among team members:

This is a male-dominated society. Women don't have much of a say here and most nurses are female and not of this country. We do show them respect ... Work is the same as the society. The doctor, a male, will always be at the top, so we will have to be under him and give him respect. I think outside and inside the hospital, it is still male dominated. (participant 9)

It's the culture; you can't just talk back to male people in this country ... It's the cultural thing I think ... It seems engrained in the culture of the Saudi people.
(participant 7)

Participants explicitly expressed concern that male dominance in the work environment was a safety threat, given that the majority of nurses were females. They were worried about the consequences on safety culture of their lack of empowerment. Participants stressed the importance of having male nursing leaders in allowing them to speak up, which ultimately would enhance the safety culture. One participant presented her opinion about the importance of male leaders in nursing:

I think being male and being Saudi at the same time is important for us, because he can bridge the gap between his nurses and the surgeons if a problem arises ... Unlike if you have a female as a director; she can't talk to these surgeons in a more direct way. (participant 7)

One of the participants talked about her experience with a new male Saudi nurse leader. She indicated that he helped nurses in voicing their concerns. She reflected on her experience with female and male nursing leaders in Saudi Arabia:

We have a stand, and a leg to stand on. We have our director at the premises ... We have been having a woman as director, and now that we have [Mr X], he's a Saudi, number one, and he's a man ... [Being a Saudi and a man] gives much more power. It does. Sometimes you go and tell [Mr. X], I have [issues with] A, B, C and D; and then the person is called. Now they'll be talking whether in English or Arabic. But they'll come to a consensus and it will be okay in no time. It's solved. (participant 6)

The influence of the Saudi culture was also extended to the social interactions among employees. They indicated that, during their breaks, socialisation was limited to colleagues of the same gender. As one participant explained:

We have a female lounge and male lounge here. So a female can rest and have their food in the female lounge and a male is separated from the female lounge (participant 5)

In this sub-theme, participants talked about the influences of the Saudi culture on their work environment and the safety culture. They expressed their need for male Saudi nursing leaders to maintain a power balance with other, usually male-dominated, departments. Participants felt more secure and more respected when they had such leaders.

6.2.1.4. Being a foreigner

The influence of the culture on the work environment had led the participants to feel like foreigners. In this sub-theme, they continued to describe their feeling as foreigners, which they associated with stress, loneliness and feelings of helplessness. Some highlighted the effect of being a foreigner on their work. They pointed out some strategies they used to overcome such feelings. Being a foreigner could have a direct effect on the unity of the team; they tended not to feel like part of the team when they classified themselves as foreigners.

Participants experienced loneliness as they were away from family and friends. They felt more stressed when they could not live among families and friends. They gave different examples of how they relieve stress. Some tended to work more; they found free time to be troubling as they did not have many social activities:

Very lonely situation. The fact that you come to work, you go back to your room, just being alone in that room, your friends circle around you, but there's no loved ones. (participant 4)

Sometimes working relieves stress for me. It's better during the week ... if you're sitting there the whole weekend and you don't know what to do, don't know where to go, it's so stressful ... It's just stressful for you to be here. Just to be here.
(participant 6)

They indicated that living as foreigners was an adjustment that they had to make

Because you came here, you will work here, you will be adjusting yourself. You must be adjusted, because you are a foreigner here. (participant 1)

They identified different methods for adjusting to being a foreigner. They set targets and worked to achieve them. One of the most common targets was working to improve their financial status, which helped them to overcome hurdles they encountered when away from their families. However, setting a goal to overcome such issues made some participants feel more helpless:

We manage ... because we came here, we have to work. To earn money, we have to work; we have to focus on that goal. (participant 15)

What can they do? We're in another country. They all came here to work for the money. So they have to do their job and go home ... we have to do whatever requested. We cannot refuse. (participant 10)

Despite some benefits of working with colleagues from the same culture, participants expressed their concerns about being dealt with based on their cultural background. These concerns were extended to include unexpected differences between their cultures and the local culture. They explained how the local culture influenced their work environment and dealings with other colleagues. Cultural complexities made it

difficult for participants to integrate with the local culture. Lack of belonging led to helplessness and frustration.

6.2.2. Safety culture and patient safety

This theme presents the issues related to teams in the operating theatres. It is divided into five sub-themes. In the first sub-theme the nurses describe the characteristics of their teamwork. In the second they talk about issues related to communication between team members. The third sub-theme presents the communication difficulties they face with their patients. When discussing Saudi culture, participants raised issues about the local language (Arabic). Participants highlighted the difficulties they faced in communicating with their patients. Suggestions included the provision of Arabic classes and hiring translators. They argued that bilingual people would help bridge the gap between health care workers and their patients.

In the fourth sub-theme, the nurses talk about the image of nursing and how they are perceived by other team members. Their concerns about their ability to advocate for their patients is presented in the fifth sub-theme. These sub-themes collectively provide a rich description of the issues around team structure and teamwork.

Lack of good teamwork influences patient safety. A good description of the team structure was given by one nurse when she provided an overview:

We have the DON, the director of nursing in operating rooms, who's on the premises. Then we have the head nurse. Then we have charge nurses ... Then we have nurses allocated to all the theatres. So our communication goes with a hierarchy like that. If we have a problem at ground root level, we tell it to the charge nurse, who will communicate it to the office up until it reaches the DON; if we cannot solve it, but if we can, there's no problem ... And we have anaesthetists and surgeons, each one of them has got their little committee. So if we have

communicated and we have spoken about things in our meetings, there is another meeting where there will be only the heads of the departments who will sit and talk. And that is how our communication will go. (participant 6)

6.2.2.1. Teamwork

The participants described some of the positive effects of good teamwork on them and their work, and its effect on productivity and patient safety. The role played by supervisors and the surgeons in the team was emphasised. They pointed out some issues with teamwork that were seen as important.

According to the participants, if their surgeon was cooperative the quality of the teamwork improved. The surgeon's cooperative nature boosted their confidence level. Difficult situations are expected in operating theatres. Surgery requires cutting and dissecting, and bleeding is expected at any time of the operation. Bleeding can be considered one of the difficult situations, especially if the source cannot easily be located or accessed. One participant narrated a difficult situation and how the surgeon's behaviour helped to overcome it safely and confidently.

I like a friendly attitude from the surgeon side, so that I can anticipate and participate more confidently ... I scrubbed for pancreatic tumour resection; it was a quite large tumour. While dissecting the tumour, we had unexpected bleeding ... It depends on the surgeon's attitude and ability. With my luck, our surgeon was very excellent, no shouting, no panicking and he managed very well, even with that critical situation. So I felt at the end of the day, I can do whatever critical situation with that person. I can do and I can manage. (participant 5)

In addition, working on a well-organised team relieves fatigue. Good teamwork is also linked to better safety for patients:

If a good team we will be happy to work for even the 10 cases; we will not feel tired. (participant 3)

If there is good teamwork, you don't have to be worrying about other responsibilities because you know that the other people can do their things, so you have to be only working wisely on your own ... You will finish your job well and on time. The patient will go home safely." (participant 15)

As indicated in the last illustration, for any task to be achieved, team members have to work collectively—that is, everyone has certain responsibilities to take care of. The participant continued by commenting on the negative effects on team members when their colleagues failed to fulfil their duties:

Some cannot do the task well, so you have to cover up for them and you end up doing your job and their job ... It's a difficult thing ... It hurts us ... It would be like additional burden for you. (participant 15)

Conflicts happen not only when team members fail to do what is required of them; they also arise when other members do something that is not their responsibility. This mix of responsibilities exerts pressure on other team members and creates conflict. In operating theatres, nurses are responsible for calling the next patient on the list and preparing the theatre for surgery. They know how long it takes them to prepare and how long it takes the patient to reach the theatre: the nurses manage these processes effectively. When other members of the team interfere with their work, it pushes them to take shortcuts in their work. One of the participants illustrated this point:

The holding area nurses inform us that our patient is here ... We did not call for the patient, we are not yet ready. We still need to prepare ... Then they inform us the surgeon was the one who called them to bring down the patient. (participant 1)

Most participants were concerned that the meaning of teamwork had been lost. They expressed their need for the reimplementation of the teamwork concept. One of the participants summarised these comments:

Between all of us, it goes a very long way for people to understand that we are a team, we work together. (participant 6)

Participants pointed out that cooperation among team members needs to be improved. One of the participants explained that team members needed to be more forgiving of each other:

The only thing is that the attitude of everybody. They should change, they should accept from each other ... They should not feel bad. (participant 16)

Participants discussed their views of the importance of good teamwork in their work. They provided examples of difficult situations that were overcome safely owing to good teamwork between the team members. They also provided examples of how less than optimal teamwork affects them and their patients.

6.2.2.2. Communicating within teams

In a discussion of communication between team members in operating theatres, participants expressed concern about their communication with each other within the surgical team, referencing the lack of communication by commenting on their different languages. They indicated that people from the same background spoke their language despite other members of the team not understanding them, which they felt had a negative impact on them and on patient safety. They felt that language difference was a barrier in

training new staff. They recognised that English was the official language at the hospital, but indicated the need to enforce it.

It was recognised that communication among health care workers needed to be improved. Participants emphasised the importance of communication among the team members:

Actually in regard to improvement, number one is communication between colleagues. Communication here is very important. (participant 19)

The participants discussed issues related to communication among nurses. They indicated that they speak English, the formal language of the hospital, as a second language. Difficulties arise when almost all team members speak English as a second language. Misunderstanding each other was one of the difficulties mentioned by the participants:

Even among us the nurses, even we speak English, it is different. It is different communication between us as we were not raised as English people. Somebody is originally a Filipino and somebody is originally Indian. He is not an English person ... Sometimes we don't get to understand each other and he probably say something, which has different meaning for me, but he doesn't mean it ... It's not only between Arabs and us, also among us. (participant 15)

Difficulties in speaking and comprehending English are one reason that team members tend to speak their own language. They find it more convenient and easier to express their ideas. However, they work as part of a team that includes people who cannot understand their language, and this affects their teamwork and communication flow:

The most important barrier in this whole thing is language, still. Because, in a team, you find that you are three or four nationalities; team of nurses ... the two

will be talking in their own language in the presence of the patients. And I don't know what they say. (participant 6)

Communication problems explained the effect on the other members of the team as well as on patient safety. Communication can break down when individuals speak in a language not understood by every member of the team:

It's the policy of the hospital to speak English in the hospital ... It has to be enforced ... you can hear that inside the theatre, three languages, four languages ... you feel left out. It irritates you. Really it's very irritating and sometimes you just want to go out of the room ... You try to focus and then you hear this in the background ... It does affect you. (participant 7)

It's all for the patient, patient's safety, you need to speak in English. I don't know what I will understand when she speaks in her language. (participant 10)

In addition, they indicated that new staff were not always able to speak English fluently, which affected their willingness to train new staff. Nor could they communicate well with new Saudi staff owing to the language barrier:

Some of the new Saudi staff, they don't know how to speak English ... if you want to teach them, you cannot teach well because of this language barrier. (participant 20)

Participants indicated there were inherent difficulties in communicating with each other on the nursing team, and identified aspects of patient safety that were affected by the communication barrier. The low level of communication was responsible for less interaction and unity within the nursing teams. They also described communication

between the staff and their patients as another challenge. It was indicated that being from different backgrounds has a similar effect on their teams.

6.2.2.3. Communicating with patients

This sub-theme focuses on issues involving communication with Saudi patients. It complements the previous sub-themes in that it addresses communication difficulty, but it stands alone as a sub-theme because of the importance of communication with patients as partners in health care, and the consequences of communication difficulty on patient safety. This sub-theme presents the participants' views on language difference between staff and patients as a problem. They identify the Arabic language, which is different from theirs, as a problem for them and for the health care services that they provide.

The language barrier was an issue from the moment participants arrived in Saudi Arabia. They expressed their perceptions of the importance of speaking Arabic to provide good health care to Saudi patients and identified language difference as a problem that has implications for patient safety and the provision of proper and safe health care:

I was not aware that in Saudi, there will be someone who doesn't know English ... So when I came here, I found people who could not understand a yes. And they know something else instead of a yes ... That's a very big gap that we have. If you cannot talk, communicate, with your patient, and you do not know what she is saying to you and she does not understand what you are saying to her, that's a very big gap (participant 6)

If you want to really establish a good rapport with your patient you have to speak fluent Arabic. (participant 5)

Not being able to speak Arabic affected not only patients and the delivery of health care services, but also the participants themselves as they felt guilty and helpless when not able to speak with patients:

I'm feeling guilty that I don't interact with patients that much, because I don't speak Arabic very well. (participant 18)

Maybe if I can speak Arabic more, my patient care will be more improved. Because sometimes the patient is asking but really I don't know. Even though I want to answer ... but really, it is hard for me because I don't speak Arabic. (participant 19)

Participants also indicated the importance of properly understanding their patients. They stated that a lack of communication affects the quality of their work; it also affects the safety of their patients. They gave different examples of situations in which patients could be harmed due to the language barrier.

I think it's also important for the patient safety [that] they can tell you everything ... If you ask the patient 'do you have any dentures?', if there's none, they'll say no, no, but they cannot explain to you that they have a fixed bridge, which is also important. (participant 8)

They emphasised the importance of language in improving patient safety. One participant argued that, although errors and safety issues arise in health care settings where patients and health care workers speak the same language, health care settings that include language barriers are more susceptible to errors. Such a comparison helped put their concerns into perspective, showing the potential magnitude of safety issues in operating theatres in Saudi Arabia:

In other countries, problems arise even when they speak the same language. How much more if you have a multicultural setting, you take care of Arabic-speaking people and the nurses are from another nationality, so it would be great to have

this [Arabic classes] open for them to improve on their speaking skills. (participant 7)

Another participant provided an example of how other countries deal with health care workers speaking different languages. She indicated that health care workers are required to take English language tests when they intend to work in English-speaking countries such as the USA and Australia to ensure that they are fluent in the national language of the country. The participant argued that health care workers working in Saudi Arabia should also be fluent in the national language, Arabic, or at least have some basic skills:

When you go to America, you are taking exams like IELTS [International English Language Testing System]. So you have to learn their language before you work. I think it is also a must for us here. [It is] for patients also to understand you because it is not their fault also being a patient in their place. They are Arabs, so they have also that right for that matter. (participant 15)

Participants indicated that they needed to learn Arabic. They suggested that the best way was for the hospital to provide Arabic classes, and indicated a need and willingness to attend them. However, such classes have not been offered to staff in operating theatres.

If I will have that power to improve patient safety, [it will be] Arabic classes for better nurse–patient interactions. (participant 18)

Translators could help solve the language barrier between the health care workers and their patients. According to participants, translators can help communicate clearly with patients, enabling them to understand their patients more holistically. However, translators are a short-term solution for this problem:

If we can appoint Arabic speakers ... to be part of us, we can solve easily this problem because they can get information from the patient, they can translate in English to us. Educated people should work as interpreters, so they can solve the problem. (participant 5)

In this sub-theme, participants identified the language difference as a barrier between them and their patients. They indicated that it affected their quality of care and the safety of their patients. They agreed about the need for Arabic classes for the non-Arabic speaking health care workers; they also indicated their need for bilingual professionals to help in translating between them and their patients.

6.2.2.4. Receiving respect

In the previous sub-themes participants talked about teamwork and communication. In this sub-theme they pointed out their concern about the lack of respect, appreciation and cooperation that they experienced from other professionals. Some participants reflected on how others view their status as professionals, and their importance as part of the team.

Nurses in operating theatres are responsible for all stages of the surgical procedure. They are responsible for admitting patients into the operating theatre, preparing the instruments and assisting the surgeon throughout the procedure. Filling out the paperwork, discharging the patient, cleaning the theatre and preparing for the next patient all fall under nurses' responsibilities. When the nurses perform these duties, they expect recognition and appreciation.

Participants were frustrated about not being recognised as professionals. They were also concerned about not receiving appreciation for the job they do:

Most people still do not see nurses as professionals and then I would assume that they are still in the dark ages. Well, nursing is a profession and then they tend to

neglect us a bit. Okay, not a bit, a lot. We feel very unappreciated, is the term, really unappreciated and not important. (participant 9)

Sometimes we (nurses) feel less respected. (participant 16)

They raised concern that the surgeons do not cooperate with them. Some felt that the lack of cooperation from surgeons was because surgeons perceive nurses to be subordinates:

The lack of cooperation ... [surgeons] don't want to cooperate with nurses. (participant 19)

You know with these surgeons I think it's universal. They really think that they are above the nurses. But we want, as nurses, to be treated equal ... They don't think of us as equals. (participant 7)

Their concerns were not related exclusively to surgeons; they had similar concerns about their supervisors. One of the nurses talked about the lack of encouragement for nurses from their supervisors and how it affected their work and improvement:

Even from the superiors also if we do something good, we have to be appreciated not only for scolding, not only for depressing and keeping you down. (participant 3)

This lack of appreciation was further explained by another participant who expressed her feelings about the lack of appreciation and support for nurses:

No one cares about the nurses ... People should support us ... [We need] appreciation. (participant 10)

The participants had concerns about how nurses were perceived and treated. They indicated their need for appreciation and recognition.

6.2.2.5. Speaking up

The previous sub-theme discussed the lack of respect for the nurses in operating theatres and this sub-theme follows by pointing out the difficulties participants face in speaking up about safety issues. They discussed the effect of their immediate leaders on them and on patient safety. As they provided examples of good leadership and its effect on their work, they also discussed some concerns about their ability to speak up.

Participants recognised the importance of good leadership, and pointed out the impact of their leaders on their work. One talked about the importance of the supervisors' role in the team:

If the in-charge is good, it's really nice. [It feels like] they're taking half of the burden, so we can relax. But if the one who is leading doesn't know the job, it's a disaster. (participant 10)

As the participants recognised and appreciated good leadership, they also voiced concerns about poor leadership. They indicated that poor leadership affected patient safety. Their concerns focused on the open communication between themselves and their superiors:

Supervisors should be more cooperative with the staff to improve patient safety ... It will make a big difference ... If I'm free to my head nurse or my charge nurse, why should I be scared to tell if something goes wrong in the room! (participant 3)

Participants used several strong words when they explained that they did not feel comfortable in commenting on the policies and procedures. They talked about feeling "ashamed" and "afraid" and the fear of "do[ing]something wrong." One participant summarised it as being asked to "do as [they are] told":

We're not telling [our comments on policies] to the head. We just only keep on talking with the other sisters ... Because we are ashamed, you know, and then we

are afraid also ... maybe they will get angry with us ... We're trying to avoid that we do something wrong. We're just following what they are telling us. (participant 20)

Teamwork, communication between team members, communication between health care professionals and their patients, respect between team members and speaking up were the main issues discussed by participants about safety culture. They pointed out how these issues directly affect patient safety. In addition, they discussed how those elements of safety culture affect them and their patients.

6.2.3. Conflict in theatres

This theme reports participants' descriptions of conflicts in the operating theatres and their related issues. Five related sub-themes are included. The first, *conflicts affecting professionals*, talks about the examples of conflicts and their effect on health care workers. The participants shared their experiences of conflict and openly described their feelings. They describe the perceived effect, supported by examples that they had experienced, of these conflicts and their feelings about the safety of their patients in the second sub-theme, *conflicts affecting patients*. The third theme, *sources of conflicts*, identifies sources of conflicts extracted from participants' stories. In addition, participants describe their ways of handling and managing the effect of conflict in the fourth sub-theme, *handling effect of conflicts*. Their personal ways of dealing with conflict can be understood as strategies to cope with the effect of conflict, especially given the lack of appropriate solutions, as described in the fifth sub-theme, *solving versus resolving*.

6.2.3.1. Conflicts affecting professional

In this sub-theme, nurses provided examples of conflicts in theatres and talked about their effect on them. They expressed their feelings when they were caught in such situations. Their words showed how significantly they were traumatised by those actions. One participant indicated that it was an "abuse situation":

He threw the instrument at me! It really got out of hand ... [I felt] very, very hurt, very, very sore inside ... I was in tears because it was very emotional. Because everyone was at me and looking ... It's really not a nice feeling. I'm talking from the bottom of my heart ... Very, very stressful. I can't explain to you. At one stage, I wanted to leave. But financially, I couldn't leave ... It's not a nice thing to talk about. It's like an abuse situation ... I was broken inside. (participant 4)

The abuse was not only emotional. Others described physically and emotionally abusive situations:

[Examples of abusive situation were] throwing instruments at you ... or throwing solutions on you, saying things that are hurtful, deliberately trying to praise one nurse and look at you and say that you are lazy or something like that in front of a whole lot of people. (participant 9)

Despite physical abuse which included having instruments and solutions thrown at them, the nurses talked more about emotional pain. Almost all their descriptions were about their feelings and emotions. The following examples highlight the nurses' descriptions of how they felt after experiencing such situations:

I actually was traumatised by it ... I wanted to be swallowed by the floor and just to vanish from the world ... I was humiliated really. (participant 7)

It makes you feel low and incompetent ... You feel flustered ... You will feel really down and out ... By the end of the day we are still humans, we are still girls with feelings. (participant 9)

The sister is not a robot, they have feelings also ... It's painful. (participant 20)

These emotions affected the nurses at work and outside work. Some used medications to help them cope with these emotions:

At the end of the day, we will always be depending on the medication. Especially we're abroad; we are away from our family. (participant 5)

Participants' responses suggested that these situations and the resulting emotions affected them more than they were aware of. The emotions seem to have been buried, as if participants were trying to forget that they existed:

It brings all the memories and, actually, I don't want to put myself exactly into the picture because I had a situation like that, and I told myself, I'm not going there again, ever. (participant 6)

However, these situations, feelings and emotions tended to resurface. One explanation for this was that nurses indicated that their duty was to "adjust":

We feel bad, but still we adjust. (participant 17)

6.2.3.2. Conflicts affecting patient safety

As participants described their emotional and physical feelings, they also voiced their concerns about the safety of their patients. In the previous sub-theme participants gave some examples of conflict and described how they felt. They also recognised, in this sub-theme, that these conflicts were negatively affecting patient safety. They indicated that they lost concentration, which could result in catastrophic results. One participant pointed out that emotions play a great role in this risk:

[Conflict] affects the patient as well in a way because [when] you become so emotional, you don't know how to handle this. (participant 4)

A detailed example of how conflict can lead to risks to patients' lives was given by another participant. She described how emotions affect concentration and ultimately affect the safety of the patient:

You can actually do the biggest mistake of your life. He's (the surgeon) angry, you're angry, and the patient bleeds and he's asking you for a clamp. You give him a scissor. And he can cut the major artery when he's trying to clamp. He's cutting because you gave him a scissor instead of a clamp. Because you're both angry. You know, anger can blind you. You think you're looking, but you're not seeing anything. (participant 6)

Handing the wrong instrument to the surgeon was one example of the effect of conflict. Instrument counting, as participants pointed out, is one of the most important safety defence strategies in operating theatres. It guards against leaving instruments inside patients. Participants indicated that conflict affects their concentration when involved in instrument counting, which could lead to safety breaches. One respondent explained that

You're already stressed and you might do some of the counting wrong, because you cannot see properly ... [It is] harmful to the patient ... Sometimes you couldn't find the thing and maybe it's just in front of you. (participant 10)

6.2.3.3. Sources of conflicts

As participants explicitly shared their feelings and concerns, they also discussed the effect that conflict had on other health care professionals and their patients. Different strategies employed by the nurses to cope with such stressors were outlined and discussed. In this sub-theme, the sources of conflicts in theatres were discussed. Most conflicts were found to centre on appropriate preparation and the availability of instruments and equipment. Participants indicated that some team members were unable to handle stressful situations and, consequently, started conflicts with others. Other conflicts were engrained in some workers' personalities and attitudes.

Every operation requires the preparation of all of the instruments expected to be used during the surgery. It is the nurses' responsibility to prepare all needed instruments beforehand. They discuss any amendments, such as the unavailability of a certain instrument, with the surgeons before the start of the operation. The participants identified incomplete preparation and unavailability of instruments as sources of conflict in operating theatres.

The surgery could be at a stage where that instrument is needed immediately, such as a clamp for a bleeding artery. Bringing another one from the store takes time, which may not be available. One participant explained that improper preparation for surgery was a source of conflict with surgeons:

Sometimes incomplete preparation, you know sometimes we will forget. If we forget something, we need to go back to the store and that takes five minutes of delay. That might extend surgery time and get the surgeon angry. (participant 5)

If the instrument is available but forgotten by the nurse, this is an issue. The other issue is if the instrument is not available at all. Sometimes, the supply of a certain instrument might not be available for a certain period of time. The supply issue usually stems from purchasing department issues, so frontline personnel can do nothing about it. However, the surgeon expects the availability of these instruments and operates accordingly. Conflict can arise when he/she discovers the unavailability of such instruments.

Sometimes we don't have any supply, so we cannot give if requested. That is why the surgeon is shouting. (participant 14)

Participants also indicated that, even if the nurses were completely prepared, they were still blamed if the instruments did not work during some stage of the operation.

Nurses are responsible for making sure that instruments and equipment are available and in working condition. However, one participant explained that

He'll be operating something, and if he thinks it does not work he would throw it. Every instrument and every gadget and every electrical appliance, there's a time that they give up. (participant 6)

Participants identified another source of conflict as the lack of ability to handle stress. Participants talked about situations where some of the surgeons panic when they get into difficult situations during surgery. One participant acknowledged that surgeons create conflicts because of the stress they are under, usually related to the surgery. She indicated that some surgeons cannot handle stress well and take it out on everybody:

I know of a surgeon who is forever belittling others, not only nurses, even other surgeons in the theatre. You know, when they are uptight and they are in a situation with a patient, he takes it out on everybody around him. (participant 6)

Another participant pointed out that some surgeons start the conflicts because they panic and do not know what to do:

Sometimes he is not sure, he is not sure what he will do that's why, maybe that is his way to get angry in replacement of his thinking what next he will do on this operation ... Sometimes there is a surgeon who panics. (participant 12)

Participants also indicated that some conflicts were started for no particular reason, as they were just part of some workers' personalities and attitudes. They explained that some surgeons were moody and would start conflicts without any particular reason:

It's according to their mood. Sometimes they will say okay very good, today you're okay. Otherwise, sometimes without any reason, they will throw the instruments and everything like that; it's according to their mood. (participant 3)

6.2.3.4. Handling effects of conflicts

The availability of instruments and team members' behaviours were among the discussed sources of conflicts. Following from this and the other sub-themes, this subsection explores how participants manage the effects of conflict.

Despite admitting to the negative effect of conflict on them and their patients, the nurses talked about the strategies they or other health care professionals use to handle stressors, emotions, and difficult situations. "Shoulders of steel" was one of the characteristics mentioned that helped them to manage and isolate the effect of conflict from affecting them and ultimately the safety of patients:

As a scrub sister you have to have shoulders of steel, so you have to handle everything ... I think we set ourselves up for this ... I think we are just used to it, so we are able to handle everything under pressure; anything that comes through the door. (participant 9)

Other participants indicated that the characteristics that gave them the ability to handle stressors grew from their nursing education and training to the point where they became part of their lives:

Basically for nursing, we were trained to face all kinds of difficulty in the profession ... we will manage, we will work ... It's part of our life; we accept it and manage it effectively. (participant 5)

Another participant explained how she managed to deal with conflict by partitioning her emotional life from her work life:

We will keep it here (pointing at heart) but our work will not be affected ... we can accept that is our work. You will accept because he is your surgeon. So, accept and you'll try not to be affected. (participant 20)

This emotion-isolating mechanism was elaborated upon by another participant who indicated that the effect of conflict could be counted in seconds:

He (the surgeon) was shouting a lot of things, but anyhow those things don't affect me emotionally ... It does affect my ability to concentrate, but maybe for just a second or two. (participant 18)

Participants had previously indicated that they believed difficulties were part of a nurse's routine. This belief extended to the point where they thought that the only options they had were to accept that nursing in operating theatres is a stressful job with difficulties or to leave the profession and the country for good. Despite admitting the effect of stress on any human being, the following participant indicated that nurses should not have an option. She noted some of the negative effects of stress and then indicated that nurses who cannot handle these effects should leave the profession:

Physically, you will have some headache; you don't sleep well. You feel like depressed; like you don't feel like going to work because of that stress. It's very normal. If nurses cannot really handle the stress, they are going for exit. (participant 15)

Participants pointed out that the management system enforced these options of accepting or leaving. They indicated that they had to manage or their employment would be terminated:

Because what we know, we can lose our job. Tomorrow we'll be on the flight. (participant 4)

The participants shared different ways that they used to overcome the difficulties and emotions encountered. They seemed to have lost faith in management's ability to solve these problems.

6.2.3.5. Solving versus resolving

This sub-theme discusses the nurses' expressions of concern with their current conflict resolution strategies. They indicated that conflicts were only solved momentarily although they happened repeatedly. They voiced a need to permanently resolving conflicts instead of solving them only temporarily:

We have to solve this problem, you know because as a team, we should have a good relationship with each other ... Sometimes they confront the surgeons after [the incident] ... Some seniors also go and talk to them, but they (surgeons) come again the same ... They never change, they are behaving the same (participant 11)

Another participant expressed her frustration with the conflict-resolution practice. She blamed management for not being able to stop conflict from recurring, and claimed that management did not take the issue seriously. She felt that management was unaware of the implications of conflicts on health care workers:

The management took it (the incident) over and they spoke to him (the surgeon), but nothing happened. You know, sometimes, people have to realise that it's not a joke. It's a serious issue. It's a serious issue that's affecting people's lives and it affects you so much. (participant 6)

The management's lack of proper conflict resolution was one part of the problem. Participants also expressed frustration that management did not give them feedback about any steps taken to resolve a conflict. They felt neglected; as one participant indicated,

They (the management) will call the surgeon and they will talk to each other but we are not getting any feedback from them ... But still the surgeons were not changing ... Nothing happen ... They have to investigate what was the problem and they have to solve the problem correctly. (participant 3)

The participant had lost hope in finding solutions for these conflicts.

The nurses also indicated acceptance of these conflicts as normal behaviour from some surgeons. One of the participants indicated her acceptance by stating that

Some of them have been reported and some of them refuse to change their attitude ... I think there is always one rotten egg in a bunch ... it is a vicious cycle ... There is nothing else we can do with those kinds of people that are deliberately trying to make your life hell. (participant 9)

Other participants developed different methods for solving conflicts, highlighting the extent of desperation among them. One of the nurses said that she prayed for the team every day, which led to better results:

I pray for the team really. That is my habit before coming here to do an operation, I am praying for the patient and for the team, the results are nice. (participant 12)

6.3. Summary

Conflict was present in participants' words when talking about patient safety and describing the effect of conflict on them and their patients. Ineffective teamwork, incomplete preparation and the lack of ability to handle stress were identified as the main sources of conflict in operating theatres; however, deeper sources were also identified.

Participants recognised that both conflict and safety culture were affected by deep-rooted cultural mores. One clear connection between conflict and culture was the male domination of the work environment, an inherent part of Saudi culture. Another was that cultural background determined how nurses were dealt with, a form of discrimination that weakened the cohesiveness of a team.

Culture, in its anthropological form, influenced the Saudi work environment in a way that professionals from other cultures found difficult to understand or adapt to, especially without sufficient cultural introduction. This influence was reflected in

weaknesses in the safety culture and manifested in conflict between team members. Such conflicts affected health care, professionals' lives, and their quality of care.

Chapter 7: Discussion

This discussion is guided by the research questions and aims, and integrates the results of the mixed methods used in this study. Culture in its anthropological form, which has emerged during this study as a significant factor in patient safety, is discussed first despite being an answer to the last research question. Furthermore, the discussion examines the relevance of an international safety assessment tool, the SAQ, to the Saudi Arabian context, and considers the safety climate in Saudi Arabian operating theatres in relation to international data and benchmarking.

As first described in section 1.3, this study was guided by four main questions and their sub-questions:

- 1- What is the current safety climate in the operating theatres in the MOH's hospitals in Riyadh?
 - a. What are the main characteristics of the perioperative teams and do they differ between hospitals?
 - b. What characteristics of individuals are related to perceptions of safety culture?
 - c. How valid and reliable is a Western-based instrument in describing the Saudi Arabian context?
- 2- How do healthcare professionals rate the quality of communication with members of other surgical disciplines?
- 3- What, if any, areas of patient safety can be improved in the operating theatres?
- 4- What aspects of Saudi local culture could have an influence on patient safety?

7.1. Culture and safety culture

In the belief that patients are an essential part of the medical team (Oates, Weston, & Jordan, 2000; Reynolds, 2009), this study has answered the fourth research question, *what aspects of Saudi local culture could have an influence on patient safety?* This question allows an exploration of cultural influences on patient safety, given the differences between patients in Saudi Arabia and the predominantly expatriate medical team members (Al-Shahri, 2002; MOH, 2012). It was found that the differences in the cultural backgrounds of both patients and health care professionals were evident and had a negative influence on patient safety; to alter this will first require a thorough understanding of the ramifications of cultural differences in a health care context. A discussion of the influence of different health care professionals' cultural backgrounds on patient safety is presented after first discussing the influence of differences between health care professionals' and Saudi Arabian patients' cultural backgrounds.

7.1.1. Patients' cultural background and patient safety

Saudi Arabian patients are a cultural case presenting obvious differences from other cultures (Long, 2005). These differences are apparent in expatriate participants' descriptions of their first experience of the Saudi Arabian culture as "cultural shock", "challenge" and "different than our cultures". Their responses to open-ended questions as well as the questions in the interviews highlight three dominant cultural aspects that are believed to influence patient safety in operating theatres: gender segregation and a desire for privacy; language differences between health care professionals and Saudi Arabian patients; and low health literacy.

Respondents struggled to manage cultural issues that involved gender segregation. As interaction between unrelated adults from opposite genders is not accepted in Saudi Arabian culture (Aldossary et al., 2008; AlMunajjed, 1997; Mackey, 2002), difficulties

arise when health care professionals perform physical assessments on patients of the opposite gender (Sullivan, 1993).

Different studies have found that (generally) Muslim and (specifically) Arabic females highly prefer female physicians (McLean et al., 2012; Nigenda et al., 2003; Rizk, El-Zubeir, Al-Dhaheri, Al-Mansouri, & Al-Jenaibi, 2005). Despite similar preferences reported in Western countries, especially in the field of obstetrics and gynaecology (Aboul-Enein & Aboul-Enein, 2009; Adams, 2002), the majority of Arabic females insist on having female health care professionals for all medical procedures (Govender & Penn-Kekana, 2008; McLean et al., 2012). Social and physical contact between genders in highly gendered societies such as Saudi Arabia is restricted by cultural and religious norms (Rizk et al., 2005). Such restrictions affect the optimal provision of health care: for example, Saudi Arabian females have reported difficulty in asking questions and obtaining information from male physicians (Nigenda et al., 2003).

Study participants expressed their struggle to understand the level of privacy sought by Saudi Arabian patients. Difficulties in understanding and meeting some patients' requests, such as the demand for a single-gendered theatre in which all the treating team members are of the patient's gender, and women wishing to be covered head-to-toe all the time, were expressed. Some participants struggled to understand these cultural aspects of patients even after having been in Saudi Arabian for an extended period of time, which highlights the persistence of these issues and the lack of appropriate solutions to date. Difficulties in understanding the cultural traits of Saudi Arabian patients were worsened by the inability of many medical staff to speak the patients' language.

This linguistic inadequacy between non-Arabic-speaking health care professionals and patients was raised as another hurdle to the provision of optimal and safe health care. *Language discordance* occurs when health care professionals and their patients lack proficiency in the same language (John-Baptiste et al., 2004; Sears, Khan, Ardern, &

Tamim, 2013). It has been linked to significant increases in physical harm resulting from adverse events (Divi, Koss, Schmaltz, & Loeb, 2007) and to longer hospitalisation (John-Baptiste et al., 2004). Participants argued that as errors and adverse events were evident in contexts where health care workers and their patients did speak the same language, it was easy to imagine how the likelihood of error increased in contexts where they are faced with language discordance. For instance, an Australian retrospective study of ICU admissions (n = 20,082) found that patients' low English-speaking status significantly and independently increases the risk of death with an odds ratio of 1.91 ($p < 0.001$) (Douglas, Delpachitra, Paul, McGain, & Pilcher, 2014).

Participants described feelings of guilt and frustration at the limitations on the quality of their care imposed by language discordance. Sullivan (1993, p. 445) explains this frustration, for both patients and health care professionals, as the amount of information lost because "even the best interpreter may not ask the questions I have asked, and may misinterpret, abridge, amend or modify the patient's response". Language discordance is also found to have a significant influence on the understanding of discharge instructions (Karliner et al., 2012). In addition to the frustration resulting from the feeling of not being able to care for their patients as they wish, participants also expressed concern with the patients' low health literacy.

Health literacy is "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Parker, Ratzan, & Lurie, 2003, p. 147). Low health literacy has been associated with low health status, high hospitalisation, poor disease management and less use of preventive measures, resulting in decreased health care quality and increased cost (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; Nielsen-Bohlman, Panzer, & Kindig, 2004; The Joint Commission, 2007). Mistrust of the health system and the medical team, not communicating their medical history to the surgical team, use of Saudi

traditional medicine, and lack of adherence to post-operative instructions were the main issues related to health literacy raised by participants. Improving health literacy is considered an essential and strategic aspect of any health system (Andrulis & Brach, 2007; Nielsen-Bohlman et al., 2004; Nutbeam, 2000, 2008); and it is not only a patient phenomenon but equally a system phenomenon (Paasche-Orlow & Wolf, 2007).

Schyve (2007, p. 360) describes cultural differences, language discordance and a low level of health literacy as the “triple threat” to effective health communication. This was evident in the results of this study, when participants expressed their lack of satisfaction with (and increased frustration about) their levels of connection and communication with their patients. Patients with successful communication skills are characterised as actively engaged with their health management, exemplified by their willingness to discuss health concerns, to ask questions and explain symptoms (Hester & Stevens-Ratchford, 2009; Mead & Bower, 2000; Zolnierek & DiMatteo, 2009). A high level of health literacy has been linked to patients’ empowerment, which is essential for communication to be successful (Tones, 2002).

The relationship between culture, language and health literacy has been described as complex (Andrulis & Brach, 2007). Culture and language are recognised as barriers to the improvement of health literacy, as they set barriers upon the attainment and use of health literacy skills and, ultimately, of patient safety (Johnstone & Kanitsaki, 2006; Nielsen-Bohlman et al., 2004; Singleton & Krause, 2009). Culture is particularly implicated among patients from a minority culture, usually with low levels of proficiency in the main language, within a mainstream culture (Andrulis & Brach, 2007; IOM, 2009; John-Baptiste et al., 2004; McLean et al., 2012; Parker et al., 2003; Singleton & Krause, 2009). However, the difference in this study is that the majority (if not all) of Saudi Arabian patients speak the one language, Arabic, which is different from the expatriate health care professionals’ (Al-Shahri, 2002; Luna, 1998). However, the effect of the

patients' cultural background and language on interpreting health messages delivered in poor Arabic or in translation remains applicable (Berkman et al., 2011; Singleton & Krause, 2009). The difficulty of understanding Saudi Arabian culture, which is described as conservative, plus the communication barriers manifested by language differences, results in a perception of systemic and persistent low health literacy in Saudi Arabian patients.

More significantly, this study finds that the health care professionals' cultural background and language influence the safety culture in operating theatres. Although literature on the influence of health care professionals' multiculturalism on patient safety until now has been non-existent (Almutairi et al., 2013). Following is the discussion of this influence.

7.1.2. Employees' cultural background and patient safety

This study links the cultural background and language of health care professionals to patient safety. A new dimension, *multicultural workplace*, looking at the association between cultural traits and safety culture, was developed and tested. The elements of this dimension (gender, communication and cultural background) have their foundations and essence in the anthropological concept of culture (Best, Williams, & Matsumoto, 2001; Kress, 1988; Mills, 1988; Phillips, 2013); they are also relevant to safety culture. In addition to the significant correlation between the multicultural workplace dimension and other dimensions of the safety climate, their relevance is evident in the interviewees' views: different aspects of safety culture are linked to the multicultural nature of their workplaces.

Safety culture is argued to be a subculture of organisational culture (Cooper, 2000; Frazier et al., 2013; Guldenmund, 2000), and national culture is argued to influence organisational culture (Hofstede, 1984). Hofstede (1983, p. 75) indicates that "[a] key issue for organization science is the influence of national cultures on management", rejecting the

widespread perception of his time of the universality of management. He suggests that the influence of national culture on organisational culture is based in politics, sociology and psychology (1983, p. 75–76). Organisations are influenced by national identity when they try to adapt to a host society's norms and regulations. One reason for seeking a society's approval is to attract consumers (patients in health care organisations) and, most importantly, employees. These employees are influenced by their national psychology, and thus play a role in changing the organisation's culture. Although Hofstede's claims are based on studies of corporate businesses, this study finds that they are equally relevant to health care providers.

7.1.3. Multicultural workplace dimension

Respondents from 28 different nationalities participated in the first phase of this study. The way professionals perceive working with colleagues from different nationalities and cultures was investigated through newly developed items: *'Working with personnel from different cultures does not reduce the quality of communication'*, *'I do not find it difficult to work with employees of the opposite gender'* and *'I do not find it difficult to work with employees from another culture'*. The results of the exploratory factor analysis showed that the three items above had good psychometric properties, indicating the presence of a multicultural workplace dimension, and suggesting a relationship between multiculturalism and the quality of work, and of the work environment (see Section 5.4.3). Cronbach's alpha value of 0.79 indicates that this dimension has strong internal consistency. Its overall mean is 3.6 out of 5 (SD = 0.96), indicating that respondents held moderately negative perceptions of their multicultural workplace (< 4, equivalent to "agree" on the scale); only at one site did 60 per cent of respondents hold a positive perception. Nurses, as well as females, had significantly lower perceptions of their

multicultural workplaces. These results indicate the need for improvement in the way workplaces handle their multinational and multicultural workforces.

The multicultural workplace dimension significantly correlated with teamwork climate, safety climate, job satisfaction and stress recognition: that is, it significantly correlated with all valid SAQ dimensions except working conditions. With the exception of stress recognition, which correlated negatively with all other dimensions from the original scale, the multicultural workplace dimension correlated positively with all valid dimensions of the SAQ. This shows the importance and relevance of this dimension to the internationally validated safety climate.

The three items constituting the multicultural workplace dimension related to the respondents' perceptions of the effect of three important cultural aspects: communication, gender and cultural background. Respondents' perceptions of the effect of multiculturalism on the quality of communication were less positive than their perceptions of the effect of gender and cultural background on their dealings with each other. However, none exceeded the cut-off mean for positive perception, 4 out of 5 (equivalent to "agree" on the scale). This shows that quality of communication is most affected by the presence of a multicultural workforce, a finding supported by the results of the quality of communication rating scale and the interviews.

7.1.4. Communication

To answer the second research question, a part of SAQ investigating the quality of communication and collaboration between health care professionals was retained; however, it was limited in this study to the measurement of communication only, to avoid confusion for participants. Despite this, the results are comparable with studies by Makary et al. (2006) and Thomas, Sexton & Helmreich (2003): in all three, each group rates highest its fellow professionals (except surgeons in Makary et al.'s study), and nurses rate

other groups lower than the rating they receive in return. This indicates two major findings: the presence of sub-cultures within each site (represented by professions), and the presence of some issues faced by nurses.

Conventionally, the quality of communication ratings scale is analysed by reporting differences between the means each group receives (ANOVA) (Makary et al., 2006), or simply reporting the percentage of the times a group is rated “high” or “very high” (Makary et al., 2006; Thomas et al., 2003). The accuracy of the personal judgement or rating of others has been argued to play a significant part in such questions (Funder, 1999), and in response to this argument, a new independent variable that accounts for the rating behaviour of respondents was developed and used in this study, as in others (Makary et al., 2006): as respondents tend to rate colleagues from the same profession higher than those from other groups, an independent variable that measured how individuals rated their own profession’s communication was added to the analysis. The newly developed independent variable, named “rating behaviour”, was found to have significantly strong and positive correlation with all the ratings received by each group ($p < 0.001$).

This slight modification (above) to the standard analysis of the SAQ provides a better understanding of the communication between professions in operating theatres as the “rating behaviour” variable can be included in multiple regressions. This analysis indicated that, controlling for rating behaviour, profession and language were among the significant factors predicting the rating of quality of communication. Nurses rated other professional groups significantly lower than the rating they received from each. In addition, non-Arabic respondents had lower perceptions of the quality of communication, despite English being the formal language used by employees in MOH hospitals (Tumulty, 2001). Only 13 per cent of respondents in the first phase indicated they spoke English in their homes, so the majority of health care workers in operating theatres spoke English as a second language,

supporting earlier findings (Aldossary et al., 2008). These findings support the results of the multicultural workplace dimension, especially regarding the quality of communication.

Communication in English as a second language has several implications for employees and patient safety. One main problem is that semantic differences in expressions and accents lead to misunderstanding, anxiety and ultimately affecting safety (Woodrow, 2006). Employees speaking English as a second language may be reluctant to admit not understanding a task or instructions, to avoid embarrassment (Brunero, Smith, & Bates, 2008). Participants in the second phase of this study indicated similar issues, expressing difficulty in understanding different accents, being misunderstood, and feeling foreign and isolated. It was indicated that “even [though] we speak English, it is different ... we were not raised as English people ... sometimes we don’t get to understand each other ... It’s not only between Arabs and us, also among us”. Such differences point out some of the issues that are constantly present in health care work. While the setting of this study differs from the Australian, English-speaking one of Brunero et al. (2008), the findings are similar.

7.1.5. Gender and cultural background

The work environment is found to be influenced by national (local) culture, a finding in alignment with the seminal work by Hofstede (1983) regarding the influence of local culture on organisational cultures and work environments. The patriarchal Saudi culture, as described by the participants of the interviews, influenced the work environment. Nurses summarised the influence of the local culture (in the form of gender in this case) on work environment as “this is a male-dominated society; women don’t have much of a say here and most nurses are female and not of this country”. This could be an explanation for gender appearing as a significant predictor of the multicultural workplace dimension, of which females had significantly lower perceptions than their male

colleagues. Highly-gendered societies have been reported to influence female workers negatively, especially in the form of inequality between genders (Mumtaz, Salway, Waseem, & Umer, 2003). The transferability of the masculine/feminine constructs of the local culture into an organisational culture was a significant finding of Hofstede's (1983) work.

The dominant culture (usually the local culture) has been found to clash with minority cultures in the workplace and affect its people (Konno, 2006). The present study finds that although locals constituted less than a third (29.4%) of a workforce comprising 28 nationalities; they were still the largest and most dominant group. MOH statistics indicate that 36.2 per cent of nurses and 23.8 per cent of physicians in Saudi Arabia are locals (MOH, 2012). Lower percentages of Saudi Arabian nurses are reported elsewhere: 12 per cent in ICU settings (Alayed et al., 2014) and 1.7 per cent in ambulatory settings (Zakari, 2011).

Despite participants describing the local culture as dominant, the presence and influence of other cultures on the work environment was evident. Participants' descriptions such as "we are a minority here" and "outnumbered" indicate the presence of competing cultures in the workplace. The presence of different cultures with different levels of influence results in some of them dominating dealings with, and expectations of, other health care workers. Dealings based on cultural background, could be referred to as cultural stereotyping in this context, evident in the example given by one of the participants when she explained that colleagues from one culture "won't talk back ... we do understand that" and described how others took advantage of this when dealing with this group: "they would rather keep them quiet". This finding from the interviews supports the importance of cultural background as an element of the multicultural workplace dimension.

Unlike other studies that have looked at multinational health care workers as a minority group (Allan, Cowie, & Smith, 2009; Brunero et al., 2008; Omeri & Atkins,

2002; Tuttas, 2014), the Saudi Arabian setting differs in the expatriate health care workers being the majority. Despite differences, issues raised in this study support the international evidence: there is minimal integration and interaction with the local culture (Brunero et al., 2008; Konno, 2006). Given that the work environment is influenced by the local culture (Hofstede, 1983), the lack of interaction and the inability of international health care workers to immerse themselves in the culture are reflected in a lack of integration with the work environment. In addition, this study finds some issues concerning speaking out when patient safety is breached. Other studies report silencing, marginalisation and discrimination (Allan et al., 2009; Konno, 2006; Omeri & Atkins, 2002; Tuttas, 2014); however, this is not looked at from the perspective of patient safety. The ability to speak up is a critical component of patient safety (Sayre, McNeese-Smith, Leach, & Phillips, 2012) and the inability to speak up may result in serious adverse events. Such findings show that a safety culture can be influenced by aspects of the general culture.

7.1.6. Manifestation of the influence of culture on safety culture

Culture manifests itself in this study in different forms: as national culture and its influence on the work environment; or as the effect of different cultural backgrounds in dealings between health care professionals. Regardless of the form in which culture is manifested, it has a profound influence on safety culture. Issues linked to the influence of cultural backgrounds, gender and communication on safety culture are revealed and manifested in conflicts in the operating theatre. *Disruptive behaviours* is the term used in the literature referring to conflict, among other issues including abuse, bullying and intimidation in the workplace (Saxton, Hines, & Enriquez, 2009). Even though it is a long-standing issue, agreement on a definition of disruptive behaviour is yet to be achieved (Saxton et al., 2009). Common characteristics of disruptive health care providers (usually physicians) were described by Pfifferling (1999, p. 57) as those who constantly (or

occasionally) show “disregard for the dignity of others, especially those with less power”. It has been reported to be both horizontal (between workers with the same power level) and vertical (between workers with different power level) (Griffin, 2004; Lemelin, Bonin, & Duquette, 2009).

In health care workplaces, nurses and junior physicians are the main groups affected by disruptive behaviours (Bigony et al., 2009; Curtis, Bowen, & Reid, 2007; Duffy, 1995; Walrath, Dang, & Nyberg, 2010). This study found that issues still rise between nurses and physicians despite this area having been researched and written about since the 1970s (Hodes & Van Crombrughe, 1990). Several studies have made findings similar to this study, indicating the universality of these issues regardless of context (Patel et al., 2011; Rosenstein, 2011; Rosenstein & O’Daniel, 2008; Rosenstein & O’Daniel, 2006; Saxton et al., 2009). Conflict and resultant stress affect the health of care workers; they are also found to pose risks to the safety of patients. Participants reported several emotional and physical effects of conflicts on patients, and voiced their concern about safety as a result. They explained how they lost concentration during the surgical procedure because of the pressure disruptive behaviour exerted on them, and this could have catastrophic results for patients if they handed out the wrong instrument or miscounted their equipment.

Rosenstein and O’Daniel (2008) surveyed more than 4500 employees in 102 US hospitals and found that 77% had witnessed disruptive behaviours. Most importantly, 71% believed disruptive behaviours were linked to medical errors and 27% believed they were linked to patient mortality. Surgery was the most reported of specialities in which disruptive behaviours are exhibited (Cook, Green, & Topp, 2001; Rosenstein & O’Daniel, 2008). The safety of the employees and the patients were reported to be affected by disruptive behaviours (Bigony et al., 2009; Walrath et al., 2010). Participants’ main concern in this study was in the way conflicts were handled, and they complained that a

lack of proper solutions and inadequate handling of conflicts increased their stress. This is a recurrent issue in the literature of disruptive behaviour (Pfifferling, 1999; Rosenstein, 2011; Rosenstein & O'Daniel, 2008; Saxton et al., 2009).

Generally, conflicts in theatres mainly develop around time, resources and work roles (Lingard et al., 2004a; Lingard, Garwood, & Poenaru, 2004b; Lingard, Reznick, Espin, Regehr, & DeVito, 2002). Conflict between cultures (the dominant against the minorities) is also a major source of conflict (Brunero et al., 2008; Omeri & Atkins, 2002). In addition to these findings, which are relevant to this study, the inability to handle stress is also found to be a major source of conflict in operating theatres. Theatres are identified as stressful places in this study and elsewhere (Rosenstein & O'Daniel, 2008). Respondents believed that conflicts started when colleagues could not handle stress, especially during surgical procedures.

Handling stress is considered part of operating theatre non-technical skills (Flin, O'Connor, & Crichton, 2008; Mitchell & Flin, 2008). Surgical and technical difficulties, increased workloads, time pressures, distractions and interruptions were among the most reported stressors (Arora et al., 2010a; Arora et al., 2009; Sevdalis, Forrest, Undre, Darzi, & Vincent, 2008; Sevdalis, Healey, & Vincent, 2007; Wetzel et al., 2006). Despite stress being recognised as undermining surgical performance and elevating risks, coping strategies are yet to be fully acknowledged and incorporated into surgical training (Arora et al., 2010b; Wetzel et al., 2006).

When looking through cultural lenses, conflicts or disruptive behaviours may be seen as a result of tensions between different levels of cultures. Culture, in its anthropological form described by Hofstede (1991) as *software of the mind*, influences actions and thinking, and helps to form human nature and personality. Culture is learnt (Hofstede, 1991), not innate, and conflict may be expected when expectations from different groups of people are based on their cultural assumptions (Briley, Morris, &

Simonson, 2000; Brislin, 1993). There are different levels and categories of culture, as described by Schein (2010), such as macrocultures, organisational cultures, subcultures and microcultures, and the influence of context in distinguishing between different levels of cultures is a major contributor to the complexity of this topic: for instance, looking at medicine as a subculture of hospital or as a macroculture with its own subcultures, as described in section 2.6, will alter the perception of cultural influence: in other words, it is difficult if not impossible to specify which category and level of culture drives an action that results in conflict.

To illustrate, consider a conflict between a Swedish female nurse working with a Japanese male surgeon in a paediatric Saudi Arabian surgical theatre. In this scenario there are different levels of culture that could contribute to conflict, regardless of its type, making it difficult to know which one is the prime driver, or if it is operating solely or jointly. The conflict may occur at the profession level—nurse vs. physician (Lingard et al., 2002); but is the profession level a macroculture, influenced by international assumptions common to nursing or surgical professions, or a subculture of the hospital's organisational culture and influenced (indirectly) by the Saudi Arabian national culture? Or has a single aspect of a national culture influenced the conflict, as might occur if assumptions about gender clashed, given that the masculinity index of Sweden is 5, but 95 for Japan (Hofstede et al., 2010). Masculinity index is a relative index with higher values relate to distinct emotional gender roles such as men expected to be assertive and tough unlike women whom are supposed to be modest and tender; whereas near 0 values relate to overlap between these emotional gender roles between both genders (Hofstede et al., 2010).

Different levels and categories of culture associated with safety culture in operating theatres have different influences. Safety culture is one category of the broad concept of culture and is both influenced by, and influences, other categories and levels of cultures.

The multicultural workplace dimension was developed and tested to investigate the perceptions of health care professionals about the influence of multiculturalism on the safety climate and, ultimately, culture, in their workplaces. It was found to be strongly associated with other internationally validated dimensions of safety climate. The strong relevance of this dimension to other dimensions of the safety climate and to the Saudi Arabian context showed the importance of this dimension to the improvement of patient safety, which answers the third question about the areas of patient safety that need to be improved. While the other dimensions are still relevant to patient safety, the influence of culture is considered to be the one aspect that will most benefit from improvement, because it is relatively new concept.

7.2. Adaptation of SAQ in the Saudi context

This section answers the first research question and its sub-questions. It discusses the use of the SAQ and its applicability to the Saudi Arabian context with exploration of the respondents' characteristics and provides an overview of the safety climate and culture in operating theatres in Saudi Arabia.

The first phase yielded a response rate of just above 60 per cent, considered representative of safety climate and ultimately descriptive of safety culture (Sexton et al., 2006a). The highest response was from nurses (71.8%) who are traditionally more responsive than physicians (Hamdan, 2013; Schwendimann et al., 2013). Additionally, in the present study, there was a very low rate of missing data, and a large number of responses to open-ended questions. The number and relevance of issues raised in the open-ended questions, the representative response rate, and the low missing values are indicative of the acceptability of the SAQ in Saudi Arabian operating theatres.

7.2.1. Composite scale reliability

Composite scale reliability for the SAQ (0.88) was as strong as in the original study (0.90) (Sexton et al., 2006a). Cronbach's alphas for the dimensions ranged between 0.71 and 0.82 except for the perception of management dimension (0.44). One of the perception of management items, *hospital management does not knowingly compromise the safety of patients*, has previously shown problems in confirmatory factor analysis' results: Zimmerman and colleagues (2013) excluded this statement from their analysis as it lacked clarity to their participants.

The confirmatory factor analysis' goodness-of-fit indices were used to investigate the construct validity of the SAQ and were satisfactory. The p value of less than 0.001 was one of the issues of the model fit to the data, mainly resulting from using a large sample (Jöreskog, 1969). TLI (0.85) and CFI (0.87) were just below the recommended level of > 0.90 , and RMSEA (0.06) was below the critical value of 0.08 (Browne & Cudeck, 1993).

Examination of the correlation matrix showed moderate relationships between the six dimensions. The highest correlation was between teamwork climate and safety climate ($r = 0.71$). Interestingly, the correlation between these two in the original study was 0.72 (Sexton et al., 2006a). The lowest correlation was found between stress recognition and all other dimensions, as in other studies (de Carvalho & de Bortoli Cassiani, 2012; Göras, Wallentin, Nilsson, & Ehrenberg, 2013; Kaya et al., 2010; Nordén-Hägg et al., 2010; Sexton et al., 2006a). Stress recognition has previously been considered distinct and detached from other dimensions (Zimmermann et al., 2013); it is the only dimension excluded, for ambiguous reasons, from the Chinese version of SAQ (Lee et al., 2010)

Stress recognition was the only dimension that showed significant differences between the Arabic and English text on the univariable analysis. This difference was not significant when adjusted for other potential predictors (i.e. using multiple regressions).

This indicates that the difference was more related to the respondents' demographics than to the translation.

It is concluded that the Arabic translation of the SAQ, with the exception of the perception of management dimension, is a reliable and valid tool to investigate patient safety in Arabic operating theatres. Given that there were issues with psychometric properties of the perception of management, it was not clear if the translation was affected by these issues or it was more related to the differences in understanding the concept of management. The understanding of the concept of management is considered to be influenced by different cultural backgrounds which is recommended to be taken into account in any cross-cultural adaptation of the perception of management dimension (Zimmermann et al., 2013). The perception of management dimension is not discussed here because of the psychometric problems reported earlier.

No Arabic translation of SAQ was located at the time of the initiation of this study in late 2010 and early 2011; however, two studies later emerged reporting results of Arabic translated tools (Abdou & Saber, 2011; Hamdan, 2013). Unfortunately, attempts to obtain these two tools, to compare and critique translations, were unsuccessful. Despite reporting the results of their studies, a psychometric analysis of their translation and cultural adaptation was not reported. In this study, a rigorous translation process was followed by psychometric analysis resulting in a valid and reliable Arabic translation of the operating theatre version of the SAQ.

7.2.2. SAQ benchmarking

This study used the SAQ to explore six different and distinct, but related, dimensions of safety climate in six different operating theatre departments in Saudi Arabia. The highest scoring dimension in this study was job satisfaction (4/5). The mean of job satisfaction is the highest in other studies conducted in Arabic countries (Abdou & Saber,

2011; Alayed et al., 2014; Hamdan, 2013; Zakari, 2011) and internationally (de Carvalho & de Bortoli Cassiani, 2012; Schwendimann et al., 2013). The lowest mean in this study is found in the perception of management, in addition to the psychometric issues presented above; this too is as found in other studies (Alayed et al., 2014; Kaya et al., 2010; Relihan, Glynn, Daly, Silke, & Ryder, 2009; Sexton et al., 2006a).

Overall, safety climate dimensions in Saudi Arabian operating theatres are comparable to other studies used SAQ in different contexts and cultures (Figure 9; Table 7.1). More importantly, variations are evident between and within clinical areas, which supports previous findings (Schwendimann et al., 2013; Sexton et al., 2006a). In addition to examining mean scores (either using a 1-5 scale, or a conversion into a percent, with 100% representing a '5', 75% representing a '4', 50% a '3', 25% a '2' and 0% a '1', SAQ results may also be presented and compared based on the percentage of respondents holding a positive attitude (> 4/5) on a given dimension in a given clinical area. Respondents with positive attitudes on a given safety dimension were those who agreed or strongly agreed on all items of that dimension (Sexton et al., 2006a). Operating theatres where less than 60 per cent of respondents report positive safety attitudes are places that can benefit from efforts to improve quality and safety (Schwendimann et al., 2013). This study had only two dimensions where any of the sites exceeded the 60 per cent threshold: job satisfaction and stress recognition. Four sites out of six had more than 60 per cent of their respondents positively satisfied with their jobs (job satisfaction), but only one had more than 60 per cent recognising the effect of stress on their work (stress recognition). While job satisfaction rates were high, other dimensions of the safety climate need improvement.

Uniquely, this study subjected the results to regression analysis in an effort to identify the important predictors of a safety climate. It found that the work site is one of the most important factors influencing perceptions of patient safety in operating theatres. Site

is a significant predictor of each dimension of the safety climate, indicating the presence of a distinct safety culture in each site. This finding is in line with claims that SAQ is a sensitive tool for detecting differences at the unit and hospital level (Sexton et al., 2006a); age and profession of respondents are also significant predictors of most dimensions. In this study, younger respondents held less positive perceptions of safety than their older colleagues in all dimensions except stress recognition; similarly, young groups of professionals had the least positive perceptions of most safety climate dimensions in international settings (Holden, Watts, & Walker, 2009).

In regard to profession as a significant factor, nurses' perceptions of safety were less positive than other professions'. Comments about the work environment and system in open-ended questions came mainly from nurses. Internationally, nurses have lower perceptions of safety climate than physicians (Listyowardojo, Nap, & Johnson, 2011; Singer et al., 2009), but the nurses in Saudi Arabia had an extra negative influence derived from culture-related issues that affected them and their work. Nursing in Saudi Arabia is dominated by non-Arabic females working in a male-dominated environment, as participants in the interviews made clear.

Culture (represented by nationality) and gender were among the significant factors affecting workers' perceptions of stress recognition. Non-Arabic nationals and female staff had less favourable perceptions of the effect of stress on them. Gender is an aspect of culture, so culture seems to affect several aspects of safety climate and, ultimately, safety culture.

Table 7.1: Summary of international studies reporting SAQ results

Study	Setting	n returned (%)	SAQ version	Comment
Sexton et al., 2006a	Mixed professions in 2 operating theatres	385 (67%)	Operating theatres version	International benchmarking
Abdou & Saber, 2011	Nurses in a university hospital in Egypt	165 (na)	Generic version	Translated to Arabic
Hamdan, 2013	Nurses and physicians in 16 NICU	204 (69.2%)	ICU version	Translated to Arabic
Zakari, 2011	Nurses in 4 ambulatory departments in a hospital in Saudi Arabia	221 (88%)	Ambulatory version	
Alayed et al., 2014	Nurses from 6 ICUs in different hospitals in Saudi Arabia	216 (64%)	ICU version	
Kaya et al., 2009	Mixed professions in general inpatient wards in 10 Turkish hospitals	1349 (67.5%)	Inpatient version	Translated to Turkish
Zimmermann et al., 2013	Nurses and physicians from inpatient departments in two Swiss hospitals	313 (79%)	Inpatient version	Translated to German
Schwendimann et al, 2013	Nurses and physicians from inpatient departments in 10 US hospitals	1057 (85%)	Inpatient version	Compared to Swiss sample
Nordén-Hägg et al., 2010	Pharmacy personnel from 828 Swedish pharmacies	4090 (60.2%)	Generic version	Translated to Swedish
Relihan et al., 2009	All staff at an acute medical admission unit in Ireland	55 (60%)	Generic version	
de Carvalho & de Bortoli Cassiani, 2012	Mixed professions from wards in 6 hospitals in Brazil	1301(86%)	Generic version	

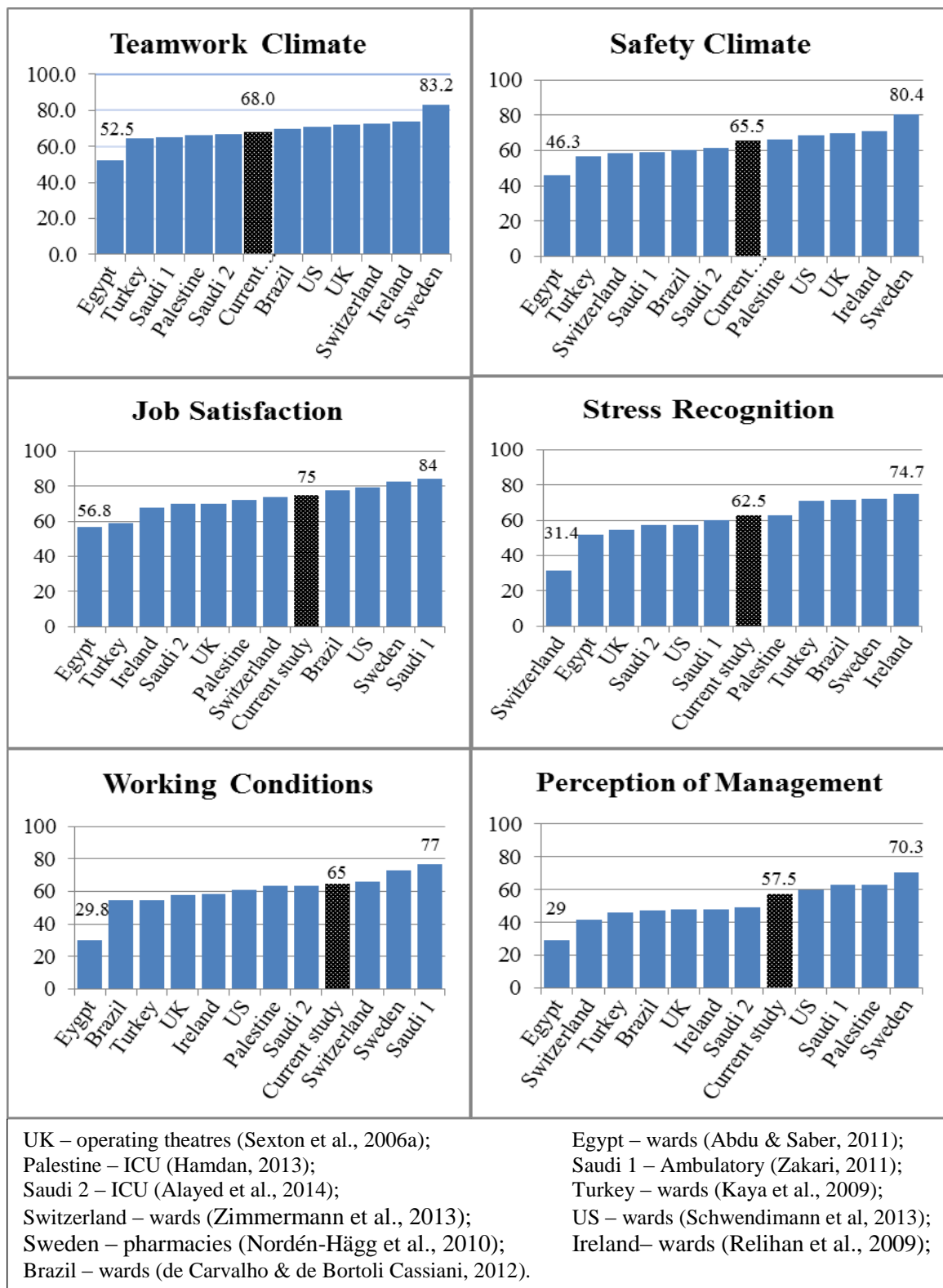


Figure 9: Comparison of means on each dimension from international settings

Note: the majority of the studies reported means as 0–100, so means were converted from 1–5 into 0–100 following this formula $(0-100 \text{ mean}) = (1-5 \text{ mean}) * 25 - 25$. A higher score is indicative of a stronger patient safety culture.

7.2.2.1. Teamwork climate

Teamwork is widely recognised as a vital component of patient safety, especially in operating theatres (Kohn et al., 2000; Undre, Sevdalis, Healey, Darzi, & Vincent, 2006). Issues related to the quality of teamwork, such as miscommunication, lack of collaboration and lack of respect, are among the findings of the interviews. The importance of these issues has long been known and argued (Baggs & Schmitt, 1988; Baggs et al., 1999; Flin & Maran, 2004; Lamb & Napodano, 1984; Manser, 2009; Undre et al., 2006; Yule et al., 2006). In this study, the perception of the quality of the teamwork climate was less than optimal, with a mean less than 75 out of 100. Concerns were raised about the quality of teamwork, summarised as “it goes a very long way for people to understand that we are a team, we work together”. As in the multinational workplace dimension, culture and cultural backgrounds were found to underpin these concerns. Respondents indicated being dealt with based on their cultural backgrounds, and this affected important aspects of teamwork including cohesion with and collaboration between team members (Baker, Amodeo, Krokos, Slonim, & Herrera, 2010; Undre et al., 2006). Positive and strong teamwork is considered an integral part of positive safety culture, characterised by less errors (Baggs et al., 1999; Saufi, 2004).

7.2.2.2. Safety climate

A positive safety climate has been described as a proactive system promoting patient safety (Sexton et al., 2006a). Proactive systems have been argued to influence patient safety positively by implementing measures that encourage safe behaviours (Cooper & Phillips, 2004). They are based on the notion of learning from previous mistakes to avert new ones before they occur or result in harm to the patients (Coyle, Sleeman, & Adams, 1996; DeJoy, 2005; Frazier et al., 2013). Unfortunately, respondents had less than positive perceptions about safety climate in their workplaces, which could be an issue of concern. Nurses and younger respondents made up the two groups with

significantly low perceptions. Nurses indicated in the interviews that they felt unrecognised as professionals and unappreciated, which could have limited their input into (and their perceptions of) the system.

7.2.2.3. Job satisfaction

Job satisfaction was the only dimension with positive perceptions (i.e. a mean score of 4 out of 5) among the respondents. High staff morale, satisfaction and autonomy have been listed as indicators of the job satisfaction dimension (Sexton et al., 2006a), which has been linked to a positive safety culture, attractive work environment, and increase in self-satisfaction (Aiken et al., 2008; Duffield et al., 2009; Judge & Bono, 2001; Nahrgang, Morgeson, & Hofmann, 2011). Despite the reported challenges of the system in which respondents work, interestingly, they also reported high job satisfaction. Knowing that the balance between job demand and job resources has been linked to, and sometimes presented as, job satisfaction (Nielsen, Mearns, Matthiesen, & Eid, 2011) makes one assume that the balance is still maintained despite these challenges.

7.2.2.4. Stress recognition

An operating theatre is recognised as a stressful environment (Rosenstein & O'Daniel, 2008), which necessitates understanding by health care professionals to of the effect of stress on their mental ability and performance (Arora et al., 2009; Arora et al., 2010b; Wetzel et al., 2006). Along with stress, fatigue from long hours of intense concentration impairs professional judgement and responses (Williamson et al., 2011). This study found that respondents had less than optimal responses to stress recognition, especially nurses and those of non-Arabic origin. Non-Arabic nurses indicated in the interviews that they coped with the stressors they were exposed to by trying to ignore them, believing that this strategy helped them to compensate for the lack of support they received to deal with difficulties and stressors.

7.2.2.5. Working condition

Participants had less than optimal perceptions about their working conditions, another element associated with patients' outcomes and employees' satisfaction (Aiken, Sloane, Bruyneel, Van den Heede, & Sermeus, 2013; Nahrgang et al., 2011). Respondents complained about staff shortages, a problem linked directly to increased workload and low job satisfaction, and in higher risks for patients (Aiken et al., 2013; Stone et al., 2007). Furthermore, conflicts in operating theatres and their resulting frustrations created more negative feelings about the working conditions. This was also exacerbated by the lack of proper conflict resolution, in specific, and the lack of compliance to policy and procedures in general. In spite of this low perception of working conditions, respondents still held positive job satisfaction which could be related back to the balance between job demands and job resources (see Section 7.2.2.3).

7.2.2.6. Perception of management

Approval of management action has been linked to positive safety culture (Sexton et al., 2006a). Management action has been recognised as leading patient safety improvements and is an important dimension of safety culture (Colla et al., 2005; Guldenmund, 2010). The confirmatory factor analysis showed some statistical issues with this dimension in particular. It has been suggested that the concept of management differs from one context to another, or from one nation to another (Zimmermann et al., 2013), and Warner (2014) recently produced a work discussing the influence of different Asian cultures on the style and understanding of management. In Saudi Arabia, Al-Saleh and Ramadan (2011) found discrepancies between the expectations of front-line employees and their managers, which showed different understandings of the responsibilities of managers.

7.3. Summary

This chapter interpreted the results of this study and has integrated the findings of the quantitative and qualitative methods in light of the relevant literature. The Multicultural workplace dimension development, its relevance to patient safety in general and other safety climate dimensions in specific were discussed. The influence of different levels and categories of culture on patient safety was also presented. SAQ's translation and applicability to the Saudi context was discussed along with its dimensions.

Chapter 8: Conclusion

This chapter recaps the significant aspects of this study and highlights the issues raised. It provides recommendations for improvements in patient safety in Saudi Arabian operating theatres and similar settings. After a discussion of the strengths and limitations of the study, potential areas of future research are identified.

8.1. Summary of this study

In a belief of the importance of research in advancing the science and practice of patient safety, this study set out to explore patient safety in Saudi Arabian operating theatres. Health care professionals (surgeons, anaesthetists, nurses and anaesthesia technicians) working in operating theatres in hospitals in Riyadh City under the aegis of MOH, the main health provider in Saudi Arabia, were targeted. A quantitative measurement of the safety culture in their operating theatres offered an excellent opportunity to consider the factors that help or hinder the practice of patient safety. This is a complex topic, and its complexity is acknowledged in the breadth and width of the knowledge acquired using a sequential explanatory mixed methods approach in which data were collected in two phases, using a qualitative method in the second phase to explore and explain issues arising from the first, quantitative, phase.

An internationally validated tool was adopted, translated and tested in Saudi Arabian settings. It showed good psychometric properties generally, although there was some concern about the validity of one dimension. When compared with international data, participants' perceptions of each dimension under study were very much in the middle of international norms; this leaves considerable room for improvement. They were satisfied with their jobs, but did not have positive perceptions of teamwork climate, safety climate, stress recognition, or working conditions. Concern was raised about the quality of

communication between professional groups. All these have been found to have an impact on patient safety.

A newly developed tool measuring the multicultural workplace dimension was validated to investigate the influence of different cultures on the work environment. It was found to be relevant to other valid dimensions of the SAQ, endorsing its importance and relevance to safety in operating theatres.

Culture, in general, is shown to affect almost all aspects of the safety climate and safety culture in Riyadh City hospitals. The local culture has a great influence on the work environment, and cultural backgrounds of employees are clearly linked to issues relating to teamwork and communication. The lack of an effective system to achieve cultural integration, and inadequate approaches to conflict resolution, are two elements relating to cultural influences on the work environment that impact negatively on patient safety culture. The importance of anthropological culture in influencing patient safety is easily deduced from the results.

8.2. Recommendations

This research set out to investigate patient safety in Saudi Arabian operating theatres, and the recommendations suggested here are based on the interpretation of its findings in light of current and related literature. Significant issues are addressed, and these recommendations should improve patient safety if implemented. Assessment of implemented recommendations should be conducted regularly to ensure the maximum benefit to patients.

Lack of harmony between different cultural backgrounds in the operating theatres is evident. Effort should focus on creating a more equitable and accepting atmosphere between all professionals regardless of nationality or background. Findings from the multicultural workplace dimension indicate that multiculturalism has been a burden instead

of being an advantage (Pedersen, 2013). Effort should be focused on enhancing social activities among employees that will help in creating more understanding of each other. In addition, health care workers in operating theatres should have the chance to engage socially with the wider community. Participants reported concern about their failure to integrate with the Saudi Arabian community. Exposure to the wider community would help them to experience and appreciate Saudi Arabian culture first-hand. The importance of integration with the local community is advocated internationally (Konno, 2006).

One of the hindrances to cultural interaction is the reported inability to speak Arabic, the national language, in spite of being in Saudi Arabia for an extended period of time. Based on the wishes of participants, this study recommends that hospitals provide classes for their non-Arabic-speaking professionals. These classes should aim at equipping health care professionals with conversational Arabic language and, theoretically should improve the ability of expatriate healthcare workers to communicate with Saudi Arabian patients.

Along with issues in speaking the local language, respondents expressed concerns about communication and teamwork. Training that targets improvements in communication skills and teamwork should be conducted on a regular basis. Such programs have been shown to improve different aspects of communication and teamwork, such as collaboration and respect (Baker et al., 2010; Gillespie et al., 2010; Gillespie et al., 2013; King et al., 2006; Stead et al., 2009; Weaver et al., 2013). In particular, the team training should focus on potential issues around a multicultural workforce.

Nurses, the majority of whom were women from non-Arabic speaking countries, expressed their concern about working in a male-dominated work environment. Given that the majority of all other professional groups were males, nurses recommended the need for male nursing leaders to help in balancing power. One potential solution would be for hospitals to appoint Saudi Arabian male nursing leaders in the short term to help to balance

the power in the operating theatres. In the long term, hospitals should invest in the development and training of leadership skills in nurses (male and female) and work to enhance policies and procedures that will facilitate and enforce equity and equality.

There are different contributors to conflict between team members in operating theatres. One important issue is the inability to handle stress, an inevitable component of operating theatres. The most concerning issue about conflict in operating theatres was the way in which it was handled. Given their effect on health care workers and their patients, and patient safety, supervisors and managers should have more training in conflict resolution. This could be prevented from happening by using different tactics such as *graded assertiveness* which is a stepped process to escalate safety-related concerns (Curtis, Tzannes, & Rudge, 2011). In short, safety culture should be enhanced to empower people to stand up for their own safety and the safety of their patients.

8.3. Strengths and limitations

One of the main strengths of this study is the use of a mixed methods approach to investigate a very complex topic, to combine the breadth and generalisability of a quantitative survey with the depth provided by qualitative interviews. Analysing the data of the first phase before the collection of data in the second phase, a sequential-explanatory mixed methods design, enriched the study by allowing the findings to build on each other. Both findings help in explaining, supporting and confirming each other.

This study also translated, tested and validated the SAQ in Saudi Arabian settings. It approached this existing tool in a number of different and innovative ways. For example, the tool was translated into Arabic and administered in a format that allowed either English or Arabic speakers to complete the same questionnaire. Additionally, new items were added to the questionnaire, and novel forms of analysis were used, for example, the

development of the rating behaviour independent variable and using multiple regressions analysis on the SAQ to identify predictors of safety climate.

In spite of the advantages gained by collecting the data of the second phase after analysing the data of the first phase, a year's gap between these stages could be seen as a limitation. Circumstances of hospitals and employees changed during this time; however, the researcher remained conscious of the time gap during data collection and analysis. As the data collected in the second phase supported the data of the first phase, this indicated a minimal effect of the time gap.

It might also be argued that the researcher, being a male and a Saudi Arabian, could have had an influence during the interviews with non-Arabic females in the second phase in regard to the openness and the depth of information provided. Being aware of this possibility, the researcher tried to manage this limitation by fully explaining to the participants the nature of the research, and explained that the researcher was completely independent of the hospitals. The level of voluntary participation by participants, who approached the researcher after the presentation, the perceived openness of the interviews, and their depth, are suggestive of the minimal effect of this possible limitation on the results.

Despite sites D and F being significantly different from each other in the first phase in most dimensions, findings from both sites in the second phase were similar. One explanation is that the findings of the second phase, issues concerning culture, are relevant to all multinational workforces in Saudi Arabia regardless of the hospital they work in.

While MOH is the main health provider in Saudi Arabia and Riyadh is the largest and most populated city in the nation, the collection of data from a single city may be seen as a limitation. The researcher believes that the results are applicable to other Saudi cities and health organisations due to the similarities in their situations: run by the same health

provider (MOH), the presence of multicultural workforce and providing the services to Saudi Arabian patients.

8.4. Future research

Future research could explore the culture component of safety culture, following on from the findings from this study. Larger studies to investigate cultural influence on patient safety across the country are recommended. The newly developed dimension, multicultural workplace, should be investigated in different settings and cultures to test if it has wider international application.

This study provides an Arabic translation of the SAQ with its psychometric analysis. The perception of management dimension does not have good psychometric properties and should be further investigated, as should differences in culturally influenced understandings of the concept of management.

The second stage of this study interviewed non-Arabic-speaking female nurses. Other research could be conducted to investigate physicians' and patients' perceptions of the issues raised here, to see if the findings are applicable to Arabic-speaking nurses and to male nurses as well. If they are, they reinforce the finding that national and social culture are influencers on safety culture, and indicate even more strongly that action, particularly through education and better shared understandings for all parties, is required to address those issues that have an impact on patient safety in Saudi Arabian hospitals.

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Appendices

8.5. Appendix 1: Questionnaire



An exploration of patient safety climate in Operating Rooms (OR): A study of Ministry of Health (MOH) hospitals in Riyadh City, Saudi Arabia

I would like to invite you to participate in the study by filling out the enclosed questionnaire. The study is designed to provide more understanding of patient safety culture in the operating theatres from the point of view of the healthcare professionals working in this department. Your participation is needed and highly appreciated.

The research team: This study is being conducted by Fahad Algahtani as part of the requirements for the Doctor of Philosophy degree at the University of Adelaide under the supervision of Prof. Alison Kitson and Dr. Tim Schultz.

What is involved? Please fill out the questionnaire included and return it to the collection box at the reception area. The questionnaire should take 10-15 minutes to complete.

Risks: Participation in this study should involve no physical or mental discomfort. If, however, you should find any question to be offensive, you are free to omit answering it or withdraw from the study.

Participation and withdrawal: Participation in this study is completely voluntary and you are free to withdraw from this study at any time without prejudice or penalty. If you wish to withdraw, simply do not complete the questionnaire. A returned questionnaire will be considered as informed consent.

Confidentiality and security of data: These questionnaires are anonymous. All data collected in this study will be stored confidentially. Only members of the research team will have access to the data. All data will be coded in a de-identified manner and subsequently analysed and reported in such a way that responses will not be able to be linked to any individual or setting. The data you provide will only be used for the specific research purposes of this study.

Ethics Clearance and Contacts: This study complies with the ethical conduct of research in both Saudi Arabia and Australia. It has been approved by the Directorate of Research Ethics at the MOH, the HREC at the University of Adelaide and your hospital. You are, of course, free to discuss your participation with the researcher. For complaints that are not answered by the researcher, you can contact the study's principal supervisor, Prof. Alison Kitson on (+61) 8 831 30511 or on e-mail: alison.kitson@adelaide.edu.au

Thank you for your participation in this study.

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"استكشاف بيئة سلامة المرضى في غرف العمليات في مستشفيات وزارة الصحة بمدينة الرياض بالمملكة العربية السعودية"

أود أن ادعوك للمشاركة في هذه الدراسة والتي تتطلب منك فقط تعبئة الاستبيان المرفق وإعادته حسب التعليمات. إن الهدف من هذه الدراسة هو معرفة ملامح بيئة سلامة المرضى في غرف العمليات من وجهة نظر العاملين في هذه الغرف. ومشاركتك مهمة جدا لإثراء المعلومات.

فريق العمل: يقوم فهد القحطاني بعمل هذه الدراسة كأحد المتطلبات لنيل درجة الدكتوراه من جامعة اديليد باستراليا ويشرف عليه كلا من البروفيسور (اليسون كيتسون) والدكتور (تيم شالتز).

المطلوب من المشاركين: الرجاء تعبئة الاستبيان المرفق وإعادته للصندوق المعد لهذه الدراسة والموجود في منطقة الاستقبال في غرفة العمليات. تعبئة الاستبيان المرفق سوف تستغرق ما بين العشر إلى الخمس عشرة دقيقة.

المخاطر: المشاركة في هذا البحث لا يترتب عليها أي مخاطر جسدية أو عقلية وإذا أحسست بان الأسئلة لا تتناسب معك فلك الحرية المطلقة بعدم اجابة ذلك السؤال أو عدم المشاركة في الدراسة.

المشاركة والانسحاب: المشاركة في هذه الدراسة هي تطوعية ولك الاحقية في الانسحاب متى شئت ولن يترتب على عدم مشاركتك أي أعباء مادية أو وظيفية. إذا أردت الانسحاب، فقط لا تتم بإعادة الاستبيان فإن إعادة الاستبيان تعتبر موافقة ضمنية على المشاركة في البحث.

سرية وسلامة المعلومات: هذا البحث لا يهدف إلى معرفة المشاركين وكل المعلومات التي يتم تجميعها سوف يتم تخزينها بشكل سري بحيث لا يمكن أن يطلع عليها إلا أفراد فريق البحث. بالإضافة إلى ذلك، كل المعلومات التي سوف تدخل في برنامج التحليل الإحصائي يترميز مشفر لا يمكن ربطه بأي شخص أو مكان عمل. والنتائج التي سوف تنشر لن تتضمن على أسماء أشخاص أو منشآت وكل المعلومات التي يتم جمعها سوف تستخدم لغرض البحث المذكور أعلاه.

أخلاقيات البحث العلمي وأرقام التواصل: هذه الدراسة متوافقة مع أخلاقيات البحث في كل من المملكة العربية السعودية وأستراليا وتمت الموافقة عليها من قبل إدارة البحوث الطبية بوزارة الصحة ولجنة أخلاقيات البحث العلمي بجامعة اديليد وكذلك تمت الموافقة عليها من قبل هذا المستشفى. كذلك يمكنك مناقشة مشاركتك مع الباحث الرئيسي. للشكاوى التي لم يستطع الباحث الرئيسي الإجابة عنها، يمكنك التواصل مع المشرف على البحث البروفيسور (اليسون كيتسون) على الأرقام التالية:

تلفون: (+61) 8 831 30511

إيميل: alison.kitson@adelaide.edu.au

نشكر لك مشاركتك في هذا البحث

باحث درجة الدكتوراه – فهد القحطاني

إيميل: fahad.algahtani@adelaide.edu.au

تلفون: (+966) 554449926

Please Note that:

Both English and Arabic questions are identical.
Use the language that is most appropriate to you

الرجاء ملاحظة أن:

النسختين العربية والانجليزية متطابقة تماما.
استخدم اللغة التي تناسبك أكثر للإجابة عن الاستبيان

Section A: Please answer as required:

الجزء الأول: الرجاء الإجابة حسب ما هو مطلوب:

1. Your gender 1. جنسك
(Female أنثى) (Male ذكر)
2. Your age 2. عمرك
18-29 30-39 40-49 50-59 60+
3. Your nationality 3. جنسيتك
.....
4. What is the main language spoken at home? 4. ماهي اللغة الأساسية التي تتحدثها في المنزل؟
.....
5. What is your occupation at this hospital? 5. ماهي وظيفتك في هذا المستشفى؟
.....
6. How many years have you worked at this hospital? 6. كم سنة عملت في هذا المستشفى؟
0-1 1-3 4-6 7-9 10+
7. How many years of experience do you have in your career? 7. كم عدد سنوات خبرتك في هذه المهنة؟
0-1 1-3 4-6 7-9 10+

SD= Strongly Disagree غير موافق بشده	D= Disagree غير موافق	N= Neutral لا اعلم	A= Agree موافق	SA= Strongly Agree موافق بشده
---	--------------------------	-----------------------	-------------------	----------------------------------

Section B: Using the above scale, Please indicate your level of agreement with the following statements: الجزء الثاني: الرجاء إيضاح مدى موافقتك على الجمل التالية حسب الجدول أعلاه:

No.	Statement	SD	D	N	A	SA	Arabic Translation	No.
1	I like my job.						أنا أحب وظيفتي.	1
2	This hospital is a good place to work.						هذا المستشفى مكان جيد للعمل.	2
3	This hospital does a good job of training new personnel.						هذا المستشفى يوفر تدريباً جيداً للموظفين الجدد.	3
4	Trainees in my discipline are adequately supervised.						يتم الإشراف على المتدربين في قسمي بشكل كافي.	4
5	Working in this hospital is like being part of a large family.						العمل في هذا المستشفى يجعلني اشعر بأنني فرد من عائلة كبيرة.	5
6	Hospital management supports my daily efforts.						إدارة المستشفى تدعم جهودي اليومية.	6
7	Hospital management does not knowingly compromise the safety of patients.						إدارة المستشفى وبدون علم تؤثر سلباً على سلامة المرضى.	7
8	This hospital constructively deals with problem physicians and employees.						هذا المستشفى يتعامل بشكل بناء مع الأطباء والموظفين المشاكسين.	8
9	I am proud to work at this hospital.						أنا فخور بالعمل في هذا المستشفى.	9
10	I would feel safe being treated here as a patient.						سوف اشعر بالأمان لو تم علاجي كأحد المرضى هنا.	10
11	Medical errors are handled appropriately in this OR.						يتم التعامل مع الأخطاء الطبية في غرف العمليات بشكل جيد.	11
12	I am encouraged by my colleagues to report any patient safety concerns I may have.						يتم تشجيعي من قبل زملائي في العمل بالإبلاغ عن المخاوف المتعلقة بسلامة المرضى.	12
13	In this OR, it is difficult to discuss errors.						من الصعب مناقشة الأخطاء في غرف العمليات.	13
14	The culture in this OR here makes it easy to learn from the errors of others.						بيئة العمل في غرف العمليات تسهل التعلم من أخطاء الآخرين.	14
15	I know the proper channels to direct questions regarding patient safety in this OR.						أنا اعرف القنوات المناسبة في غرف العمليات لطرح أسئلتني التي تتعلق بسلامة المرضى.	15
16	Nurse input about patient care is well received in this OR.						اقتراحات الممرضين المتعلقة بسلامة المرضى تستقبل بكل شكل جيد في غرف العمليات.	16
17	The physicians and nurses here work together as a well-coordinated team.						الجراحين والممرضين يعملون هنا كفريق متناسق.	17
18	Working with personnel from different cultures reduces the quality of communication						العمل مع موظفين من ثقافات مختلفة يقلل من جودة التواصل.	18
19	I find it difficult to work with employees of the opposite gender.						أجد انه من الصعب العمل مع موظفين من الجنس الأخر.	19
20	I find it difficult to work with employees from another culture.						أجد انه من الصعب العمل مع موظفين من ثقافات أخرى.	20

SD= Strongly Disagree غير موافق بشده	D= Disagree غير موافق	N= Neutral لا اعلم	A= Agree موافق	SA= Strongly Agree موافق بشده
---	--------------------------	-----------------------	-------------------	----------------------------------

Continue Section B:

تابع الجزء الثاني:

21	In this OR, it is difficult to speak up if I perceive a problem with patient care.	SD	D	N	A	SA	في غرف العمليات، يصعب علي الاعتراض عندما أحس أن هنالك مشكلة في العناية المقدمة للمريض.	21
22	I receive appropriate feedback about my performance.	SD	D	N	A	SA	يتم مناقشة أدائي معي بشكل مناسب.	22
23	I am provided with adequate, timely information about events in the hospital that might affect my work.	SD	D	N	A	SA	يتم إعطائي معلومات كاملة وبوقت كافي عن كل الأمور التي قد تؤثر على عملي في هذا المستشفى.	23
24	New policies are well communicated to the staff.	SD	D	N	A	SA	يتم إبلاغ الموظفين بالأنظمة الجديدة بشكل جيد.	24
25	All the necessary information is available before the start of a procedure.	SD	D	N	A	SA	كل المعلومات المهمة تكون متوفرة قبل بدء العملية.	25
26	The levels of staffing in this OR are sufficient to handle the number of patients.	SD	D	N	A	SA	عدد الموظفين في غرف العمليات كافي للتعامل مع عدد المرضى.	26
27	When my workload becomes excessive, my performance is impaired.	SD	D	N	A	SA	عندما يزيد عبء العمل علي، يقل أدائي.	27
28	Fatigue impairs my performance during emergency situations.	SD	D	N	A	SA	الإجهاد يقلل من أدائي أثناء الحالات الطارئة.	28
29	I am less effective at work when fatigued.	SD	D	N	A	SA	نقل فعاليتي عندما أكون مجهدا.	29
30	I have to work consecutive night shifts.	SD	D	N	A	SA	يتوجب علي العمل نوبات ليلية متتالية.	30
31	I am more likely to make errors in tense or hostile situations.	SD	D	N	A	SA	أكون أكثر عرضة للأخطاء عندما تكون الأوضاع متوترة أو عدائية.	31
32	I find it as easy to treat patients of the opposite gender as patients from my gender.	SD	D	N	A	SA	لا أجد أي صعوبة في معالجة مرضى من الجنس الآخر.	32
33	I find it as easy to treat patients from another culture as patients from my culture.	SD	D	N	A	SA	لا أجد أي صعوبة في معالجة مرضى من ثقافة أخرى.	33
34	Disagreements in this OR are resolved appropriately (i.e., not <i>who</i> is right, but <i>what</i> is best for the patient).	SD	D	N	A	SA	الخلافاً في غرف العمليات يتم حلها بشكل مناسب (ليس بمبدأ "من هو الأصح"، ولكن بمبدأ "ما هو الأنسب للمريض").	34
35	I have the support I need from other personnel to care for patients.	SD	D	N	A	SA	يوجد لدي الدعم الذي احتاجه من الموظفين الآخرين للعناية بالمرضى.	35
36	It is easy for personnel in this OR to ask questions when there is something that they do not understand.	SD	D	N	A	SA	انه من السهل على الموظفين في غرف العمليات السؤال عن الأشياء التي لا يعرفونها/يفهمونها.	36
37	Morale in this OR is high.	SD	D	N	A	SA	المعنويات في غرف العمليات مرتفعة.	37
38	Patients here do not disclose important medical information to the treating professionals.	SD	D	N	A	SA	المرضى هنا لا يكشفون عن المعلومات الطبية المهمة للموظفين العاملين على علاجهم.	38

Section C: Please answer as required:

(for more space, please use the back of the page)

الجزء الثالث: الرجاء الإجابة حسب ما هو مطلوب:
(الرجاء استخدام ظهر الورقة اذا دعت الحاجة)

1. In the last surgical procedure you were part of, please indicate the quality of communication you have experienced with the following:

1. في آخر عملية جراحية كنت مشتركاً فيها، الرجاء إيضاح مستوى جودة التواصل مع الموظفين التاليين:

	Very low ردنية جدا	low ردنية	Adequate ملائمة	High عالية	Very high عالية جدا	Not applicable لم أتواصل معهم	
Surgeons							أطباء الجراحة
Anaesthetists							أطباء التخدير
Perfusionists							أخصائيي تروية القلب
OR Nurses (scrub & circulating)							طاقم التمريض في غرفة العمليات
Anaesthesia Technician							فني التخدير
Surgical Technicians							فني العمليات
Support staff							طاقم الدعم
Ward nurses							مرضى الأقسام
Recovery personnel							موظفي غرفة الإفاقة
ICU personnel							موظفي العناية المركزة
Other: specify							آخرين: اذكرهم

2. In your opinion, what aspects of the local culture might affect patient safety in this department?

2. في رأيك الشخصي، ماهي جوانب الثقافة المحلية التي ترى أنها قد تؤثر سلباً على سلامة المرضى في هذا القسم؟

.....
.....
.....

3. In your opinion, how the patient safety could be improved in this operating department?

3. في رأيك الشخصي، كيف يمكن تطوير سلامة المرضى في هذا القسم؟

.....
.....
.....

4. What is the overall grade of patient safety in this OR?

4. ما هو المستوى العام لسلامة المرضى في غرف العمليات هذه

فشل	رديء	مقبول	جيد	ممتاز
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
failing	Poor	Acceptable	Good	Excellent

5. Which language did you mainly use to answer this questionnaire?

5. ماهي اللغة التي استخدمتها للإجابة عن هذا الاستبيان؟

English

العربية

Please write any comments you wish to add:

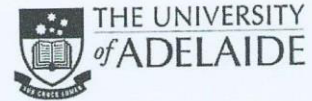
الرجاء اضافة اي ملاحظات ترغب بذكرها:

.....
.....
.....

End of the questionnaire, thank you for participating

هذه نهاية الاستبيان، شكراً لك على المشاركة

8.6. Appendix 2(1): Ethics 1



RESEARCH BRANCH
RESEARCH ETHICS AND COMPLIANCE UNIT

SABINE SCHREIBER
SECRETARY
HUMAN RESEARCH ETHICS COMMITTEE
THE UNIVERSITY OF ADELAIDE
SA 5005
AUSTRALIA

TELEPHONE +61 8 8303 6028
FACSIMILE +61 8 8303 7325
email: sabine.schreiber@adelaide.edu.au
CRICOS Provider Number 00123M

27 October 2011

Professor A Kitson
School of Nursing

Dear Professor Kitson

PROJECT NO: H-260-2011
An exploration of the patient safety climate in the operating theatre: A study from the MOH Hospitals in Riyadh City, Saudi Arabia

I write to advise you that on behalf of the Human Research Ethics Committee I have approved the above project. Please refer to the enclosed endorsement sheet for further details and conditions that may be applicable to this approval.

The ethics expiry date for this project is: 31 October 2012

Where possible, participants taking part in the study should be given a copy of the Information Sheet and the signed Consent Form to retain.

Please note that any changes to the project which might affect its continued ethical acceptability will invalidate the project's approval. In such cases an amended protocol must be submitted to the Committee for further approval. It is a condition of approval that you immediately report anything which might warrant review of ethical approval including (a) serious or unexpected adverse effects on participants (b) proposed changes in the protocol; and (c) unforeseen events that might affect continued ethical acceptability of the project. It is also a condition of approval that you inform the Committee, giving reasons, if the project is discontinued before the expected date of completion.

A reporting form is available from the Committee's website. This may be used to renew ethical approval or report on project status including completion.

Yours sincerely

 PROFESSOR GARRETT CULLITY
Convenor
Human Research Ethics Committee



RESEARCH BRANCH
RESEARCH ETHICS AND COMPLIANCE UNIT

SABINE SCHREIBER
SECRETARY
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email: sabine.schreiber@adelaide.edu.au
CRICOS Provider Number 00123M

Applicant: Professor A Kitson

School: School of Nursing

Project Title: *An exploration of the patient safety climate in the operating theatre: A study from the MOH Hospitals in Riyadh City, Saudi Arabia*

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

Project No: H-260-2011 RM No: 0000012494

APPROVED for the period until: **31 October 2012**

subject to approval of the project from the Ministry of Health, Riyadh City, Saudi Arabia. It is noted that the study will be conducted by Fahad Algahtani, PhD candidate.


Refer also to the accompanying letter setting out requirements applying to approval.


PROFESSOR GARRETT CULLITY
Convenor
Human Research Ethics Committee

Date: 27 OCT 2011

8.7. Appendix 2(2): Ethics 2

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



المملكة العربية السعودية
وزارة الصحة
الإدارة العامة للبحوث الطبية

الوكيل المساعد للتخطيط والبحوث
الرقم: ٣٧/٩/١٣٦٢٥٠٠
التاريخ: ١٤٣٢/٠٩/٢٠ هـ
المرفقات: لا يوجد
المشروعات:
38-1-236250-57-2

الموضوع: بحث طالب الدكتوراه فهد القحطاني

المحترم **سعادة مدير عام الشؤون الصحية بمنطقة الرياض**

السلام عليكم ورحمة الله وبركاته:
إشارة إلى موضوع رسالة الطالب /فهد بن ظافر القحطاني رقم السجل المدني (١٠٢٩١٥٠٤٨٧) لدراسة مرحلة الدكتوراه في التمريض بجامعة أديليد بإستراليا ، رقم الطالب الاكاديمي (١٢٠٤٤٩)، وعنوان الرسالة :
" استكشاف بيئة سلامة المرضى في غرف العمليات بمستشفيات وزارة الصحة بمدينة الرياض "

وحيث استوفى المذكور كافة المستندات المطلوبة، وتمت مراجعتها من قبل اللجان المعنية بالإدارة العامة للبحوث الطبية، وتمت الموافقة على تسهيل مهمة إجراء هذا البحث.


وحيث أن المذكور عاليه سينفذ جزء من دراسته في مستشفيات مدينة الرياض، نأمل تسهيل مهمته بزيارة المستشفيات التالية:

- مستشفى الأمير سلمان.
- مستشفى اليمامة.
- مستشفى الإيمان.

لجمع البيانات اللازمة، بما يضمن أن لا يكون هناك أي تأثير على خدمة المراجعين والمرضى خلال قيامه بمهام بحثه، مع العلم بأن وزارة الصحة لا تتحمل أية أعباء مالية أو إدارية في البحث.

شاكرين لكم حسن تعاونكم.

ولكم أطيب تحياتي ،،،



مدير عام
الإدارة العامة للبحوث الطبية

د. نبيل بن هزاع القحطاني

المدفوعة العامة للشؤون الصحية بمنطقة الرياض
مركز الاتصالات الإدارية
091321
رقم الوارد / ٠٩١٣٢١
التاريخ / ١٤٣٢-٠٩-٢٢

الرقم : ١٥٦٦٠٤

التاريخ ٢٠/١٠/٢٠١٤ هـ

المشروعات :



وزارة الصحة
Ministry of Health

المملكة العربية السعودية
وزارة الصحة

المديرية العامة للشئون الصحية بمنطقة الرياض

إدارة التخطيط والبحوث

الموضوع / بشأن تسهيل مهمة باحث

سعادة/ مدير مستشفى الأمير سلمان

المحترم

الملاء عليكم ورحمة الله وبركاته .

تجدون برفقه صورة من نسخة خطاب مدير عام الادارة العامة للبحوث الطبية رقم ٢٣٦٢٥ وتاريخ ١٤٣٢/٩/٢٠ هـ حول رسالة الطالب / فهد ظافر القحطاني لدراسة مرحلة الدكتوراه تخصص تمريض بجامعة ادليد باستراليا وعنوان الرسالة (استكشاف بيئة سلامة المرضى في غرف العمليات) .
نأمل تسهيل مهمته لإجراء هذا البحث على أن لا يكون هناك أي تأثير على خدمة المراجعين والمرضى خلال قيامه بهام بحثه.

ولكم أطيب التحيات ...

مدير إدارة التخطيط والبحوث

د/ علي بن ظافر العبيدي

سعادة/ مدير مستشفى الأمير سلمان

مديار/ الدكتور
سعادة/ مدير
٢٣
١٤

الرقم: ٧٤٣٢ / ط
التاريخ: ١٥ / ١١ / ١٤٣٣ هـ
المشروعات:



وزارة الصحة
Ministry of Health

المملكة العربية السعودية
وزارة الصحة
المديرية العامة للشئون الصحية بمنطقة الرياض
١٠٠ / ٢٧٥

إدارة التخطيط والبحوث

الموضوع / بشأن تسهيل مهمة باحث

المحترم

سعادة/مدير مستشفى الإيمان

السلام عليكم ورحمة الله وبركاته .

تجدون برفقه صورة من نسخة خطاب مدير عام الإدارة العامة للبحوث الطبية رقم ٢٣٦٢٥
وتاريخ ١٤٣٢/٩/٢٠هـ حول رسالة الطالب / فهد ظافر القحطاني لدراسة مرحلة الدكتوراه
تخصص تمرير بجامة ادليد باستراليا وعنوان الرسالة (استكشاف بيئة سلامة المرضى في
غرف العمليات) .
نأمل تسهيل مهمته لإجراء هذا البحث على أن لا يكون هناك أي تأثير على خدمة المراجعين
والمرضى خلال قيامه بمهام بحثه.

ولكم أطيب التحيات ...

طيارم

مدير إدارة التخطيط والبحوث

د/ فيصل بن عبد العزيز البواردي
١٤٢٢ هـ

الرقم : ١٤٦٥٩١ /
التاريخ : ٢٨ / ١٠ / ١٤٢٨ هـ
المشروعات :



وزارة الصحة
Ministry of Health

المملكة العربية السعودية
وزارة الصحة

المديرية العامة للشئون الصحية بمنطقة الرياض

إدارة التخطيط والبحوث

الموضوع / بشأن تسهيل مهمة باحث

المحترم

سعادة/ مدير مستشفى اليمامة

السلام عليكم ورحمة الله وبركاته .

تجدون برفقه صورة من نسخة خطاب مدير عام الادارة العامة للبحوث الطبية رقم ٢٣٦٢٥ وتاريخ ١٤٣٢/٩/٢٠ هـ حول رسالة الطالب / فهد ظافر القحطاني لدراسة مرحلة الدكتوراه تخصص قمرىض بجامعة ادليد باستراليا وعنوان الرسالة (استكشاف بيئة سلامة المرضى في غرف العمليات) .
نأمل تسهيل مهمته لإجراء هذا البحث على أن لا يكون هناك أي تأثير على خدمة المراجعين والمرضى خلال قيامه بمهام بحثه.

والله اعلم
الطيبه التعيانه ...

مدير إدارة التخطيط والبحوث

د/ علي بن ظافر العبيدي

8.8. Appendix 2(3): Ethics 3

لجنة البحث العلمي



الملكة العربية السعودية
وزارة الصحة
الإدارة العامة للبحوث الطبية

الرمز المساهم للتطوير الحديث
الرقم : ٣٦/٢٢٦٢٩٥ /
تاريخ : ٢٠ / ٠٨ / ١٤٢٢ هـ
التاريخ :
المشروعات :
36-1-230335-000

الموضوع: بحث طالب الدكتوراه قيد التحققي.

المحترم **سعادة المدير التنفيذي بمدينة الملك سعود الطبية**

السلام عليكم ورحمة الله وبركاته:

إشارة إلى موضوع رسالة الطالب /فهد بن ظافر القحطاني رقم المسجل المدني (١٠٢٩١٥٠٤٨٧) لدراسة مرحلة الدكتوراه في التمريض بجامعة أدليد بإستراليا ، رقم الطالب الاكاديمي (١٢٠٤٤٩)، وعنوان الرسالة :

" استكشاف بيئة سلامة المرضى في غرف العمليات بمستشفيات وزارة الصحة بمدينة الرياض "

وحيث استوفى المذكور كافة المستندات المطلوبة، وتمت مراجعتها من قبل اللجان المعنية بالإدارة العامة للبحوث الطبية، وتمت الموافقة على تسهيل مهمة إجراء هذا البحث.

وحيث أن المذكور عاليه سينفذ جزء من دراسته في مدينة الملك سعود الطبية، نأمل تسهيل مهمته لجمع البيانات اللازمة، وبموافقة مساعدكم فقط بما يضمن أن لا يكون هناك أي تأثير على خدمة المراجعين والمرضى خلال قيامه بمهام بحثه، مع العلم بأن وزارة الصحة لا تتحمل أية أعباء مالية أو إدارية في البحث.

شاكرين لكم حسن تعاونكم.

ولكم أطيب تحياتي ،،،

مدير عام
الإدارة العامة للبحوث الطبية

د. نبيل بن هراء القحطاني

العاملين في غرف العمليات

/ محمد القحطاني



الموضوع: تسهيل مهمة باحث

سلمه الله

سعادة / مدير مستشفى النساء والولادة

سلمه الله

سعادة / مدير مستشفى الأطفال

السلام عليكم ورحمة الله وبركاته ...

إشارة إلى خطاب سعادة مدير عام الإدارة العامة للبحوث الطبية رقم
٣٦/٢٣٦٣٩٥ وتاريخ ١٤٣٢/٩/٢٠هـ بخصوص طلب تسهيل مهمة طالب
والدكتوراه الباحث فهد بن ظافر القحطاني في تخصص التمريض جامعة ادليد
باستراليا للقيام بدراسة موضوعها اكتشاف بيئة سلامة المرضى في غرف العمليات
بمستشفيات وزارة الصحة بمدينة الرياض

نأمل من سعادتك الإطلاع و توجيهه من يلزم لتسهيل مهمة الباحث في توزيع

الاستاهة.

شاكربن لسعادتك مسن تعاونكم ...

مدير إدارة الشؤون الأكاديمية والتدريب

د / مها بنت محمد التويجري

المرفقات

التاريخ ١٤٣٢/١١/٢٥هـ

الرقم ٤٦١٠

سلمه الله

سعادة / مدير المستشفى العام

السلام عليكم ورحمة الله وبركاته ...

إشارة إلى خطاب سعادة مدير عام الإدارة العامة للبحوث الطبية رقم
٣٦/٢٣٦٣٩٥ وتاريخ ١٤٣٢/٩/٢٠هـ بخصوص طلب تسهيل مهمة طالب
الدكتوراه الباحث فهد بن ظافر القحطاني في تخصص التمريض جامعة ادليد
باستراليا للقيام بدراسة موضوعها اكتشاف بيئة سلامة المرضى في غرف العمليات
بمستشفيات وزارة الصحة بمدينة الرياض.
نأمل من سعادتكم الاطلاع وتوجيه من يلزم لتسهيل مهمة الباحث في توزيع
الاستبانة.

شاكرين لسعادتكم حسن تعاونكم ...

مدير إدارة الشؤون الأكاديمية والتدريب

د . مها بنت محمد التويجري

المرقعات ... كما في ...

التاريخ ١٤٣٢/١/٢٢هـ

الرقم ٢٤-٢



المحترم

سعادة رئيس اقسام العمليات

السلام عليكم ورحمة الله وبركاته:-

اشاره الى مذكرة سعادة مدير المستشفى العام رقم ٣٤٠٣ وتاريخ ١٤٣٣/١/٢٤هـ
ومشغوعها خطاب مديرة ادارة الشئون الاكاديمية والتدريب رقم ٣٤٠٣ وتاريخ
١٤٣٣/١/٢٢هـ وطلبهم تسهيل مهمة الباحث / فهد بن ظافر القحطاني لانهاء دراسته غرف
العمليات في اقسام عمليات المستشفى العام ومشغفي الاطفال ومستشفى النساء والولادة .
وتقبلوا تحياتي،،،

المدير الطبي للمستشفى العام

الدكتور / هيثم بن محمد الفلاح

١٤٣٣/١/٢٤

٣٤٠٣/م/ط/ع

المرفقات

التاريخ

الرقم

8.9. Appendix 2(4): Ethics 4

Kingdom of Saudi Arabia
Ministry of Health
King Fahd Medical City



المملكة العربية السعودية
وزارة الصحة
مدينة الملك فهد الطبية

January 2nd 2012
ERRC Number: 12-001

Dear Mr. Fahad AlGahtani,

It is my pleasure to inform you that the External Research Review Committee, a subcommittee of the Institutional Review Board, has approved your study titled: "**An Exploration of the Patient Safety Climate in the Operating Theatre: A Study from the MOH Hospitals in Riyadh City.**".

Please be informed that in conducting this study, you as the Principal Investigator are required to abide by the rules and regulations of the Government of Saudi Arabia and KFMC/ERRC. The approval of this proposal will automatically be suspended on **January 2nd 2013** pending the reapplication to renew the approval. You also need to notify the ERRC as soon as possible in the case of:

1. Any amendments to the project;
2. Termination of the study.

Please observe the following:

1. Personal identifying data should only be collected when necessary for research;
2. The data collected should only be used for this proposal;
3. Data should be stored securely so that only a few authorized users are permitted access to the database;
4. Secondary disclosure of personal identifiable data is not allowed.

We wish you every success in your research endeavor.

Sincerely,

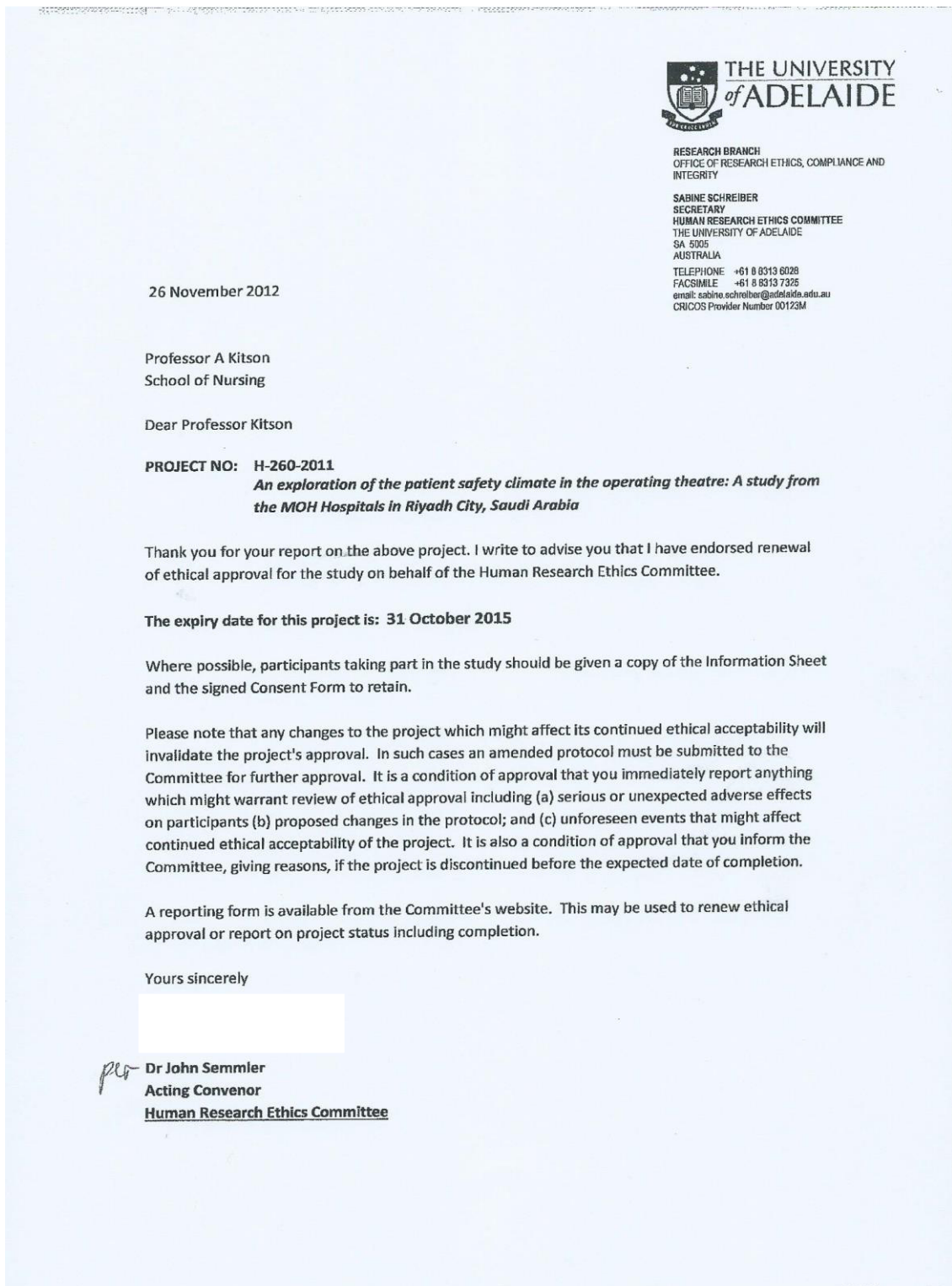
Dr. Mohamad AlTannir
Head of External Research Review Committee
Institutional Review Board
King Fahad Medical City
Riyadh, KSA

المرفقات :

الرقم :

التاريخ :

8.10. Appendix 3: Ethics phase II



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



المملكة العربية السعودية
وزارة الصحة
الإدارة العامة للبحوث والدراسات

الموضوع: تمديد بحث طالب الدكتوراه/ فهد القحطاني

المحترم

سعادة / المشرف العام على مدينة الملك سعود الطبية

السلام عليكم ورحمة الله وبركاته،،،

إشارة إلى موضوع دراسة الطالب / فهد بن ظافر القحطاني، رقم السجل المدني (١٠٢٩١٥٠٤٨٧) لدراسة مرحلة الدكتوراة في تخصص التمريض بجامعة أدليد بأستراليا ، رقم الطالب الأكاديمي (١٢٠٤٩٩)، وعنوان الرسالة :
"إستكشاف بيئة سلامة المرضى في غرف العمليات بمستشفيات وزارة الصحة بمدينة الرياض، المملكة العربية السعودية "

"An Exploration of the Patient Safety Climate in the Operating Theaters: A Study from MOH Hospitals in Riyadh, Saudi Arabia"

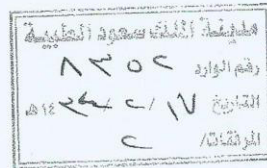
وحيث أن الباحث تقدم إلينا بطلب لتمديد البحث وهو إستكمال للمرحلة الأولى من الدراسة ولم يتم أي تغيير في بروتوكول الدراسة أو منهجية البحث، وقد إستوفى المذكور كافة المستندات المطلوبة، وتمت مراجعتها من قبل اللجان المعنية ، وتمت الموافقة على تمديد مهمة إجراء هذا البحث.

وحيث أن المذكور عاليه سينفذ جزء من دراسته في مدينة الملك سعود الطبية ، نأمل من سعادتكم الإطلاع والإيعاز لمن يلزم لتسهيل مهمته لجمع البيانات اللازمة بما يضمن أن لا يكون هناك أي تأثير على خدمة المراجعين والمرضى خلال قيامه بمهام بحثه، مع العلم بأن وزارة الصحة لا تتحمل أية أعباء مالية أو إدارية في البحث.

شاكرين لكم حسن تعاونكم.

ولكم أطيب تحياتي ،،،

الإدارة العامة للبحوث والدراسات



هاتف: +٩٦٦١٤٧٣٥٠٣٨ فاكس: +٩٦٦١٤٧٣٥٠٣٩ ص.ب الرياض: ١١١٧٦ الرمز البريدي: ٢٧٧٥
e-mail: research@moh.gov.sa



الموضوع : تمديد بحث طالب الدكتوراه

سلمه الله

سعادة / مدير مستشفى العام

السلام عليكم ورحمة الله وبركاته ...

إشارة إلى خطاب الإدارة العامة للبحوث والدراسات رقم ٢/١٣/٥١٦٦٤
وتاريخ ١٤٣٤/٢/١٣هـ بخصوص تمديد بحث طالب الدكتوراه في تخصص
التمريض بجامعة اديليد باستراليا فهد القحطاني وعنوان الدراسة:
"استكشاف بيئة سلامة المرضى في غرف العمليات بمستشفيات وزارة الصحة
بمدينة الرياض، المملكة العربية السعودية"
"An Exploration of the Patient Safety Climate in the Operating
Theaters: A Study from MOH Hospitals in Riyadh, Saudi Arabia"
نأمل من سعادتكم الاطلاع وتوجيهه من يلزم لتسهيل مهمة الباحث في توزيع
الاستبانة.

شاكرين لسعادتكم حسن تعاونكم ...

مدير إدارة الشؤون الأكاديمية والأبحاث

٢٠٢٤/٤/١٠

د / رفاه بنت صالح اليوسف

نجله/د. رفاه

المرفقات

التاريخ ١٤٢٤/٢/١٩هـ

الرقم ١٢٥٢

December 16th 2012
ERRC Number: 12-001

Dear Mr. Fahad AlGahtani,

It is my pleasure to inform you that the External Research Review Committee, a subcommittee of the Institutional Review Board, has approved your study titled: "**An Exploration of the Patient Safety Climate in the Operating Theatre: A Study from the MOH Hospitals in Riyadh City.**".

Please be informed that in conducting this study, you as the Principal Investigator are required to abide by the rules and regulations of the Government of Saudi Arabia and KFMC/ERRC. The approval of this proposal will automatically be suspended on **December 16th 2013** pending the reapplication to renew the approval. You also need to notify the ERRC as soon as possible in the case of:

1. Any amendments to the project;
2. Termination of the study.

Please observe the following:

1. Personal identifying data should only be collected when necessary for research;
2. The data collected should only be used for this proposal;
3. Data should be stored securely so that only a few authorized users are permitted access to the database;
4. Secondary disclosure of personal identifiable data is not allowed.

We wish you every success in your research endeavor.

Sincerely,

Dr. Mohamad AlTannir
Head of External Research Review Committee
Institutional Review Board
King Fahad Medical City
Riyadh, KSA

8.12. Appendix 4: Interview questions' guide

The question guide used for the interviews included those questions:

- Tell me about your experience working in Saudi Arabia?
 - Tell me about the similarities and differences between Saudi Arabia and your home country?
 - How did you learn to deal with those differences?
- Tell me about teamwork in operating theatres?
 - Tell me about teamwork within nursing discipline and across disciplines?
 - Can you give me an example of good team that you like to work with? And why you like to work with that team?
 - Can you talk about teams that you do not like to work with?
 - Can you please elaborate on the reasons that make you do not want to work with them?
 - How did you deal with those teams/issues?
- Reflecting on the issues you talked about, how do they influence patient safety positively and negatively?
 - What would you change if you have the power to do so?