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Patients Safety Culture: A Baseline Assessment Of Nurses' Perceptions In A Saudi Arabia Hospital

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PATIENTS SAFETY CULTURE: A BASELINE ASSESSMENT OF NURSES' PERCEPTIONS IN A SAUDI ARABIA HOSPITAL

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DEDICATION

This dissertation is dedicated to my parents for their love, prayers, encouragement, and continuous support, specifically, my mother Fatimah (may Allah bless her), who instilled in me the inspiration to set high goals and the confidence to achieve them, and my father Eissa (May Allah give mercy upon him), whose moral investment shaded my entire life.

I also dedicate this work to my companion in this journey, my loving wife, and to my children, Badar, Teif, Eissa, and Abdulwahab. Without their patience, endurance, and steadfast support this work would not exist.

Finally, I dedicate this endeavor to my brothers and sisters for their support and encouragement.

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CHAPTER 1

INTRODUCTION

Background of the Study

Patient safety is an essential and vital component of healthcare quality. Despite constant vigilance, health care providers face many challenges in today's health care environment in trying to keep patients safe. The issue of patient safety has become one of the most significant challenges facing the health care system. Almost every week, newspaper articles, radio and television reports, and articles in the medical literature keep issues of patient safety in the spotlight. Medical errors are the eighth leading cause of death in the United States. More people have died from medical errors than from automobile accidents, breast cancer, or Acquired Immuno-Deficiency Syndrome (AIDS) according to the Institute of Medicine (IOM, 2000).

Up to 98,000 Americans die each year as a result of medical errors. It is estimated that medical errors result in approximately $29 billion in excess healthcare expenditures and lost productivity each year (IOM, 2000). According to Health Grades Inc., patient safety incidents resulted in 238,337 potentially preventable deaths and cost the federal Medicare program $8.8 billion from 2004 through 2006. In addition, according to Health Grades (2009) seventh annual hospital quality and clinical excellence study, if the quality of care at all hospitals matched that of the top-rated hospitals, 152,666 lives may have been saved and 11,772 major complications may have been avoided during the three years of 2005-2007. Nurses represent the supervision system for early detection of complications and problems in care, and they are in the best position to initiate actions that minimize negative outcomes for patients (Aiken, Clarke, Sloane, Sochalski & Silber, 2002).

Error can be defined as “An act of commission (doing something wrong) or omission (failing to do the right thing) that leads to an undesirable outcome or significant potential for such an outcome” (Wachter, 2009, p. 268). The IOM defines medical error as "the failure to complete a planned action as intended or the use of a wrong plan to achieve an aim" (IOM, 2000, p. 210). Most people believe that medical errors usually involve drugs, such as a patient getting the wrong prescription or dosage, or mishandled surgeries, such as amputation of the wrong limb. However, there are many other types of medical errors, including diagnostic error, treatment error, medication error, equipment failure, and preventive error (IOM, 2000).

Patient safety is defined in many ways, but the IOM report, “*To Err is Human*” (2000) produced the most widely accepted definition of patient safety, stating “freedom from accidental injury; 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” (p. 211). Patient safety is conceptualized as the avoidance, prevention, and amelioration of adverse outcomes or injuries stemming from the processes of health care (Cooper, Gaba, Liang, Wood& Blum, 2000). Furthermore, patient safety is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery (Batcheller, Burkman, Armstrong, Chappell & Carelock, 2004).

Patient safety and the initiative of developing safety cultures to assure patients’ freedom from harm have become central concerns in quality improvement in the healthcare system. Developing and maintaining cultures of safety is a principal aspiration of the current patient safety movement (IOM, 2004), and sustaining a strong safety culture is seen as imperative to the delivery of safe, high quality, cost-effective patient care (IOM, 2004; Weingart, Farbstein, Davis& Phillips, 2004).

The fundamental culture shift to promote patient safety that is required in organizations necessitates an understanding of current organizational cultures. The Advisory Committee on the Safety of Nuclear Installations (1993) produced the most widely accepted definition of a safety culture. “The safety culture is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization’s health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures” (p. 23). The safety climate, while occasionally used interchangeably with culture, is more of a ‘snapshot’ of the culture and focuses on attitudes of members. Safety climate can be thought of as the measure of safety culture derived from the attitudes and behavior of the organization’s members at a point in time (Flin, Mearns, O'Connor & Bryden, 2000).

In order to promote and sustain a culture of safety in a healthcare organization, experts stress the need to understand both human individual and system contributions to error events (Weingart, et al., 2004). The capacity to maintain patient and provider safety in health care systems is linked to health care provider behaviors in performing activities of patient care, and to health care system cultures that create the context for delivery of patient care (Jones & Mark, 2005; Leape & Berwick, 2005).

Registered Nurses and Patient Safety

A variety of stakeholders (society in general; patients; individual nurses; nursing educators, administrators, and researchers; physicians; governments and legislative bodies; professional associations; and accrediting agencies) are responsible for ensuring that patient care is safely delivered and that no harm occurs to patients. Nurses play a critical role in patient

safety. Nurses, as the largest group of health care providers in the nation offering direct patient care, are vital to the effort to prevent errors. Nurses have a significant role in improving care because of their broad, yet intimate, perspective. Nurses are an indispensable part of the endeavor to find innovative solutions to improve safety, and they comprise the largest health care professional group in the ongoing provision of health care. It is estimated that 75% of actual service delivery in hospitals is delivered by nurses. As the majority provider of health services, these professionals have a significant understanding of the multiple risks patients face while hospitalized (Nicklin & McVeety, 2002). Furthermore, a survey found that 96% of nurses and 90% of physicians, pharmacists, and administrators believe that nurses have the primary responsibility for the prevention of harm to patients in the hospital setting (Cook, Hoas, Guttmannova & Joyner, 2004). It is significant to note that nursing constitutes 50% of health care manpower, and most of the health care services provided at any health care organization are provided through nurses. Patient safety has always been important for registered nurses. Nurses have a significant contribution to make in protecting and improving patient safety. Nurses are involved in the provision of health care in every area of the health care system, 24 hours a day, and seven days a week. As the principal health care providers with the patients, overseeing, coordinating, and providing care, nurses are ideally positioned to strengthen the safety net for patient care. The nursing perspective on reducing errors and improving systems must be part of a collaborative approach involving the public, other professions, employers, and governments. “Nursing is the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations” (American Nurses Association, 2003, p.7).

There have been a number of conceptual and theoretical discussions of patient safety in the literature. This has included a Normal Accident Theory, which emphasizes the ever-present possibility of accidents in organizations that exhibit complexity and "tight coupling" of processes and the inevitability of accidents (Perrow, 1984); Systems Theory, which affirms the notion that most errors are not caused by negligence or incompetence, but rather by underlying flaws in systems that create an error-prone work environment (Philips, 1999); High Reliability Theory, which holds that accidents can be prevented through organizational design and management (Weick, 1987); and the structure-process-outcome framework (Donabedian, 1992). In Donabedian's theoretical framework, three major components of care are specified: structure, process, and outcome. In Deming's Systems Theory, the appreciation for a system is a major component of a successful organization. He also indicates that a system must improve constantly and management must investigate ways to improve the quality within the organization (Deming, 1986). There have also been nursing conceptual frameworks developed, which can be used to guide the study of patient safety culture. One of these is King's Conceptual System, which consists of three dynamic interacting systems: a personal, an interpersonal, and a social. This conceptual system will be utilized as the theoretical framework for this study (King, 1981).

Statement of the Problem

While there is a plethora of literature on patient safety and medical errors, there is little information on the prevention of accidents and the provision of patient safety in healthcare institutions from a nursing perspective in Saudi Arabia. Nurses' perceptions of the existing culture of patient safety provide a description of the current status of patient safety and the nurses' approach to safety culture. Fostering a greater understanding of nurses' perceptions will

not only provide a baseline from which to work, but it will help raise safety awareness throughout the various health care organizations and identify areas most in need of improvement.

The issue of patient safety is an international concern. For example, Saudi Arabia experienced a 21% increase in the presence of medical malpractice litigations during the 2001-2002 year, taking the claims from 569 to 718 (Samarkandi, 2006).

It is noted that medical errors in Saudi Arabia reached approximately 25,920 during the years 2001-2006 (Alsawedan, 2007). By 2007, medical malpractice claims in Saudi Arabia had increased to 1026 (Ministry Of Health, 2007). The demand for medical malpractice insurance being purchased by Saudi healthcare professionals increased 116% between 2007 and 2008 (Alhasni, 2008).

While the increased number of malpractice claims in Saudi Arabia provides evidence of patients' concern for their safety, it also indicates a systematic problem in patient safety in the Saudi health care system. On the other hand, the increase in malpractice insurance purchases can only be regarded as a protective measure by healthcare professionals against legal charges. This does not address the underlying causes of the poor patient safety measures that led to increased claims and therefore increased malpractice insurance purchases. Because of the fact that health care is delivered by physicians, nurses, and other health care professionals, the concern of patient safety in Saudi Arabia becomes a concern for all disciplines, including nursing. However, as little is known about patient safety and the patient safety culture from a nursing perspective in the Saudi Arabia healthcare system, this study aims to shed light on patient safety from the perspective of practicing nurses in Saudi Arabia.

In order to decrease medical errors, organizational dimensions within health care environments should be considered and extensively studied. The IOM report "*Keeping Patients*

Safe" (2004) asserted that patient safety has not improved, partly because research on organizational dimensions of health care environments has been lacking. The main conclusion of this report was that the majority of medical errors do not occur because of individual carelessness, but rather commonly from faulty systems, processes, and conditions leading to human error or which fail to prevent errors (IOM, 2000).

According to Deming, problems in organizational performance are largely due to the system of work, not the operators, and the appreciation for a system is a major component to a successful organization. He also indicates that a system must improve constantly, and management must investigate ways to improve the quality within the organization (Deming, 1986). Lucian Leape, MD, a researcher on medical errors, has stipulated that medical errors could have been prevented by redesigning healthcare delivery systems, focusing on system failures rather than human factors. Dr. Leape's work has disseminated the concepts of human factors and systems thinking. The central message of the IOM report is that medical errors are caused by faulty systems, not faulty people (Leape, 2001).

The work of Leape, et al., (1995, p. 36) states that the "first step in an error prevention program would be to identify the systems failures underlying the errors that occur." The authors found that nurses were responsible for many of the interceptions related to errors and were able to identify potential system malfunctions as well as ways to correct these malfunctions. A variety of strategies should be employed to create a safer system including improving teamwork, communication, leadership support for patient safety, organizational learning, reporting, hospital hand-offs, and work environment (Wachter, 2009). More and more over the past decade, the health care industry has recognized that mistakes which threaten patient safety are rarely the fault

of a misbehaving individual and are almost always the natural consequence of poorly designed systems (Leape, 2001).

These dimensions are directing us toward a balanced approach that focuses on systems and work environments. The ultimate goal must be the creation of a culture of safety. A culture of safety analyzes why and how problems happen, rather than focusing on finding the person who might have been responsible (Hughes, 2004). In this environment, innovation that ultimately benefits both patients and caregivers is possible. Historically, the concept of safety culture has been focused on micro issues, such as medication errors and erroneous surgical areas, with little emphasis on the macro issue of hospital culture. The greatest challenge lies in creating a culture of patient safety in our healthcare organizations, changing our vision from crisis or blame to one of improvement. To start this process, the underlying values and attitudes toward patient safety need to be examined (Hemman, 2002).

The concept of nurses' perceptions of patient safety culture and its impact on patient safety is very important to the endurance of healthcare organizations, not only in understanding the attitude of nurses, but in providing safer care. Therefore, it is very important to assess nurses' perceptions of safety culture and understand the factors that affect RNs in this area in order to encourage them to participate and engage in the patient safety culture. In addition, measuring and understanding safety culture can prove to be helpful in targeting efforts to improve patient safety and decrease medical errors.

Purpose of the Study

The purpose of this research is to identify the systems factors that Registered Nurses (RN) perceive as contributing to a culture of patient safety and to study the effects these factors

have on nurses' participation and engagement in the patient safety culture at King Fahad Medical City (KFMC), Saudi Arabia.

Specific Aims

This study has three specific aims: (1) to assess the nursing perceptions of patient safety culture at the work unit and hospital levels, (2) to identify the most prevalent error reporting status used at KFMC and (3) to determine the relationship between patient safety culture perceptions of nurses and selected demographic variables.

Research Questions

The following research questions were addressed:

Research Question 1: What are nurses' perceptions of patient safety culture?

Research Question 2: How do nurses' perceive the error reporting status?

Research Question 3: What is the relationship among selected demographic variables and nurses' perceptions of patient safety culture?

Research Question 4: What are the relationships among safety culture dimensions?

Research Question 5: To what extent do safety culture dimensions (unit level and hospital level) predict nurses' perceptions of patient safety culture outcome dimensions?

Significance of the Study

The concept of nurses' perceptions of patient safety culture is not well studied in nursing. There is a gap in the literature regarding perceptions of patient safety culture from a nursing perspective (Scherer & Fitzpatrick, 2008; Kim, An, Kim & Yoon, 2007). When the concept of nurses' perceptions of patient safety culture is investigated, it will provide the basis for both a framework and theory that will greatly illuminate this concept. New knowledge will strengthen and build the science, and when this knowledge is discovered and tested, the science will be

provided with a more practical understanding of nurses' perceptions of patient safety culture. This in turn will assist in the evolution and development of nursing involvement within patient safety practice. The resulting outcome will produce nurses who are more aware of safety practices and patients who will benefit from a safe culture.

Although the patient safety issue has become a major academic and public concern in healthcare industries, in Saudi Arabia very few studies have evaluated the extent to which patient safety is a strategic priority among tertiary care hospitals. More specifically, this research will be the first research looking at nurses' perceptions regarding patent safety in Saudi Arabia. In addition, in Saudi Arabia, patient safety issues have been focused only on "medical" errors related to malpractice suits, excluding other patient safety issues. This research targets nurses as the frontline care providers because their perspective may provide the best reflection of the current patient safety culture. There are few studies examining nurses' perceptions of the systems problems in their work environment that may result in harm to patients. Unless an error occurs, a problem with the system often goes unreported. The goal should be to identify those risks in the organization before an error occurs. The findings from this study provide a description of the current status of patient safety in a representative tertiary hospital in Saudi Arabia from the nurses' perspective and the nurses' approach to promoting a safety culture. The findings will not only provide a baseline from which to work, they will also help raise safety awareness.

The findings from this study will add to the body of patient safety culture research. Safety culture assessments are useful tools for measuring organizational conditions that lead to adverse events and harm to patients in healthcare organizations. The assessment of safety culture is viewed as the starting point from which action planning begins and patient safety changes emerge (Nieva & Sorra, 2003). This study will provide additional information for nursing

administrators to identify opportunities for improvement in participating institutions and to establish a baseline for assessing future improvement efforts.

In conclusion, the findings from this study will add to the growing body of knowledge on patient safety culture. This study seeks to bridge the research gap by assessing factors affecting the RNs willingness to participate and engage in the patient safety culture change, as this may ultimately impact patient safety culture. Measuring perceptions and attitudes about surface features of safety culture among nurses can provide an important indication of the level of safety culture so that it can be enhanced. The data of this research could be used by hospital administrators, chief nursing officers, performance improvement directors and risk managers in developing, implementing and evaluating training initiatives. The outcomes of this research could provide information about the impact of nurses' attitudes towards safety and how this is operationally implemented in a safety culture. This data could also be used to educate hospital leaders on issues within management and communication that do not contribute to a patient safety culture.

Theoretical Framework

Many theoretical frameworks have been used to study patient safety from non-nursing perspectives, including Normal Accident Theory (Perrow, 1984), High Reliability Theory (Weick, 1987) and the structure-process-outcome framework (Donabedian, 1992), and Deming systems theory (1986). These theories and models are holistic and therefore congruent with current nursing practice and research. However, when looking at the metaparadigm of nursing, no model specifically addresses all four concepts of the metaparadigm. A metaparadigm is "the global concepts that identify the phenomena of central interest to a discipline, the global propositions that describe the concepts, and the global propositions that state the relations

between the concepts" (Fawcett, 2005, p. 4). The four concepts in the metaparadigm of nursing are human beings, health, nursing, and environment.

A review of the nursing literature found that no patient safety study was guided by a nursing theory. Therefore, King's Conceptual System was utilized in this research as the theoretical framework within which to study patient safety culture. King's Conceptual System addresses all four concepts of the metaparadigm and utilizing King's Conceptual System will develop nursing knowledge and impact the overall nursing discipline.

Overview of King's Conceptual System

King's framework provides a reference for the domain of nursing. It is based on the overall assumption that the focus of nursing is human beings interacting with their environment, leading to an improved state of health for individuals (King, 1981). King's framework consists of three dynamic interacting systems: a personal system, an interpersonal system, and a social system. King's framework was based on general systems theory. Figure 1 provides a model of the organization of these open systems in a dynamic interacting framework. According to King (1981), "some scientists who have been studying systems have noted that the only way to study human beings interacting with the environment is to design a conceptual framework of interdependent variables and interrelated concepts" (p. 10).

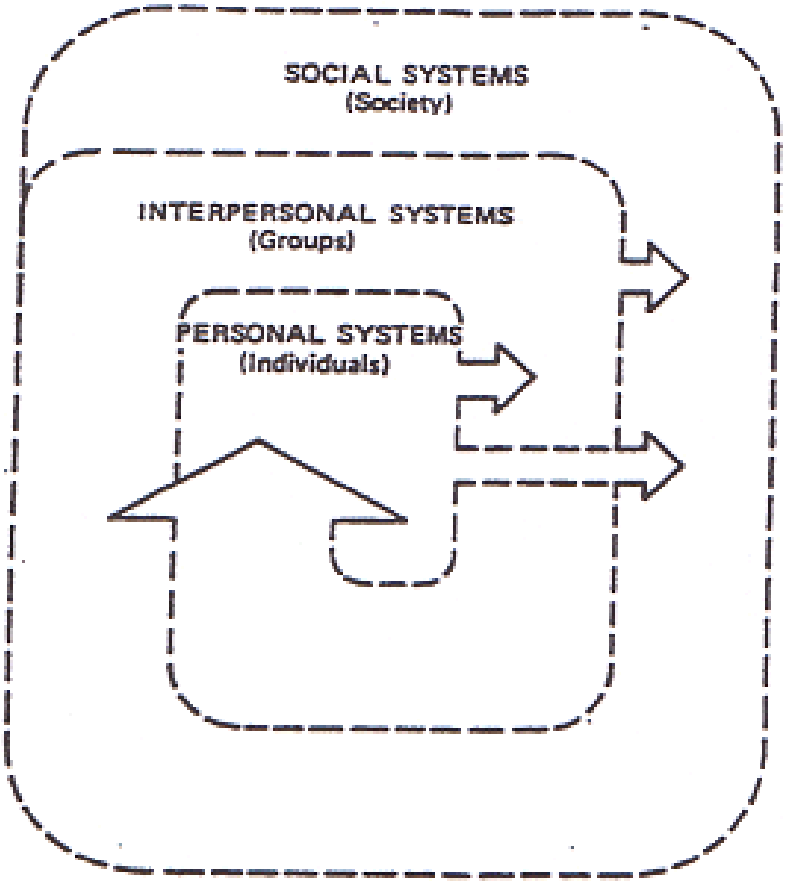

*Figure 1.*Dynamic interacting system. (King, 1981).

King (1989) summaries the conceptual framework as follows: Nursing phenomena are organized within three dynamic interacting systems: (1) personal system (individuals); (2) interpersonal system (dyads, triads, and small and large groups); and (3) social system (family, school, industry, social organizations, and health care delivery systems) (p. 151).

Personal System

The personal system is referred to as the system of the human being, or the human as a total person (King, 1981). The concepts that King considered relevant for understanding human beings as personal systems are (a) body image, (b) growth and development, (c) learning, (d) perception, (e) self, (f) time, and (g) space (King, 1989). The personal system component of

King's theory will be discussed using two of its concepts, namely space and learning. Space will be conceptualized in this research as the nursing work environment, and learning will be conceptualized as organizational learning.

Space was defined by King (1981) as the "immediate environment in which individuals interact" (p. 149). According to King (1981), "space exists in all directions and is the same everywhere" (p. 148). The operational definition for space in this discussion refers to the elements of the organization which relate to nurses' activities at their job.

The concept of learning as formulated by King (1989, 1992) is described as a self activity requiring active participation on the part of the learner. Additionally, learning is individual; learners bring their personal interests, needs, and past experience to each situation; and each individual has a different learning style. King perceived learning as the process of acquiring information, knowledge, and skills. The operational definition for learning in this discussion is a continuous cycle of reflecting on information and taking action to achieve organizational goals.

Interpersonal System

King's (1981) theoretical framework emphasized human beings as they function in several types of interpersonal systems. This system type includes a group of individuals from a larger group. These individuals interact with one another and their environment. King identified several concepts essential to understanding the interpersonal system. These concepts were (a) interaction, (b) communication, (c) transaction, (d) role and (e) stress. For the purpose of this research, the interpersonal system concepts of interaction, communication, and transaction will be utilized as conceptualized by teamwork, communication, and hospital handoffs, respectively.

Interaction was defined as "a process of perception and communication between person and environment and between person and person represented by verbal and non-verbal behaviors

that are goal directed" (King, 1981, p. 145). "When two individuals come together for a purpose…they are each perceiving the other person and the situation, making judgments, taking mental action, or making a decision to act. These two individuals react to each other and the situation" (King, 1981, p. 145). Interactions are defined as "the act of two or more persons in mutual presence" (King, 1981, p. 85). King identified interaction as being universal and reciprocal. King stated, "a concept of perceptions is fundamental in all human interaction" (p. 61). The operational definition of interaction in this discussion refers to a group of healthcare professionals working to achieve the organization goals.

Communication is "the vehicle by which human relations are developed and maintained" (King, 1981, p. 79). Communication is "a process whereby information is given from one person to another either directly or...indirectly" (King, 1981, p. 146). Communication is the informational component of an interaction, since it involves "an interchange of individuals' thoughts and opinions so they can function in their roles" (King, 1981, p. 62). Adequate communication results in order and meaning within human interactions. All human activities that link person to person and person to environment are forms of communication (King, 1981, p. 79). Communication is multidimensional, composed of two subdimensions - verbal communication and nonverbal communication (King, 1981). The operational definition of communication in this discussion refers to sharing information and ideas between professionals in the healthcare organization.

Transactions are "purposeful interactions that lead to goal attainment" (King, 1981, p. 147). King added that transactions refer to an "observable behavior of human beings interacting with their environment. Transactions are viewed as the valuation component of human interactions" (p. 147). The operational definition of transactions in this discussion refers to the

transfer of content and professional responsibility from one provider to another provider while a patient is in a hospital.

Social System

Social system is defined as “an organized boundaries system of social roles, behaviors, and practices developed to maintain values and the mechanisms to regulate the practice and rules” (King, 1981, p. 115). Social systems have a strong influence on people as they grow from childhood to adulthood (King, 1981). Social system encompasses six concepts: organization, authority, power, status, decision-making and control, plus all concepts from personal and interpersonal systems (King, 1981). For the purpose of this research, the social systems concepts of organization, power, and status will be utilized as conceptualized by leadership support for patient safety, error reporting, and nursing staffing, respectively.

Organization is defined as “human beings with prescribed roles and positions who use resources to accomplish personal and organizational goals” (King, 1981, p. 119). King proposed four parameters for organization: (1) human values, behavior patterns, needs, and goals and expectations; (2) a natural environment in which material and human resources are essential for achieving goals; (3) employers and employees, or parents and children, who form the groups that collectively interact to achieve goals; and (4) technology which facilitates goal attainment. The operational definition for leadership support refers to the activities which are performed by the healthcare organizations administrators to help nurses maintain a safe practice for their patients. According to King (1981), status “is defined as the position individual in a group or a group in relation to other groups in an organization” and “is related to who you are, what you do, who you know, what you have achieved” (pp. 129-130). The operational definition for nursing staffing is

how work is organized, how staff is deployed, and who plays what role in the patient care dynamic.

Power has been defined by King in a variety of ways:

> Power is the capacity to use resources in organization to achieve goals... is the process whereby one or more persons influence other persons in a situation... is the capacity or ability of a person or a group to achieve goals…occurs in all aspects of life and each person has potential power determined by individual resources and the environmental forces encountered. Power is a social force that organizes and maintains society. Power is ability to use and to mobilize resources to achieve goals. (King, 1981, p. 127).

The operational definition for error reporting is the actual action taken by the organization when errors occur. While each of King's concepts is designated as being applicable to a particular system, King indicated that the concepts are arbitrarily placed in one of the three systems and can be used interchangeably across systems (King, 1992). Figure 2 shows the conceptual framework for patient safety culture based on King's Conceptual System.

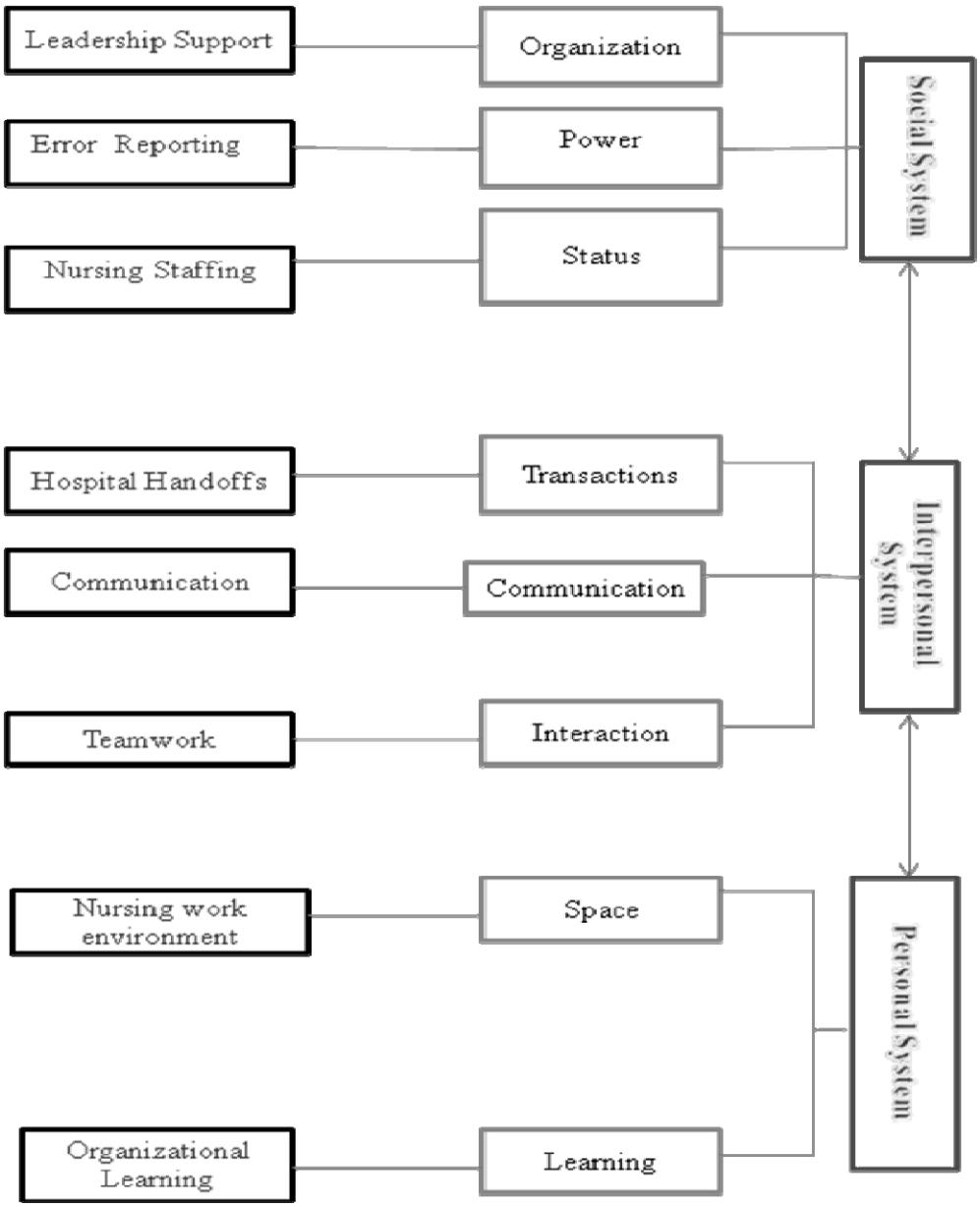

Figure 2. Conceptual Framework of Patient Safety Culture based on King's Conceptual System.

Definitions of Terms

Patient safety: "freedom from accidental injury; 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, Corrigan & Donaldson, 1999, p. 211).

Safety culture: "The safety culture is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures" (Advisory Committee on the Safety of Nuclear Installations, p. 23).

Patient safety culture: the set of values, beliefs, and norms about what's important, how to behave, and what attitudes are appropriate when it comes to patient safety in a work group (Scott, Mannion, Davies & Marshall, 2003).

Organizational climate is defined as employees' perceptions of the formal and informal policies, practices, and procedures in their organization (Schneider, 2000).

Organizational culture is defined as "A pattern of basic assumptions- invented, discovered, or developed by a given group as it learns to cope with 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." (Schein, 1985, p. 9).

Frequency of event reporting is how often the provider is willing to report an actual error event or the near occurrence of an error event in the healthcare system. This dimension is

operationalized by three items in the HSOPSC: 1) When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? 2) When a mistake is made, but has no potential to harm the patient, how often is this reported? and 3) When a mistake is made that could harm the patient, but does not, how often is this reported?

Patient safety grade is a single letter-grade safety rating that the provider would give to the unit and hospital in relation to patient safety within the healthcare system. This dimension is operationalized by one item in the HSOPSC: 1) Please give your work area/unit in this hospital an overall grade on patient safety. This single-item measure is graded with A through E as possible response categories.

Number of events reported is the self-reported number of error events and forms that the provider has filled out and submitted in the previous 12 months. This dimension is operationalized by one item in the HSOPSC: 1) In the past six months, how many event reports have you filled out and submitted? This single-item measure has numeric response categories.

Openness of communication is the level of comfort the provider has in addressing issues of patient care quality and safety with individuals who are in positions of higher authority within the healthcare system. This dimension is operationalized by three items in the HSOPSC: 1) Staff will freely speak up if they see something that may negatively affect patient care, 2) Staff feel free to question the decisions or actions of those with more authority and 3) Staff are afraid to ask questions when something does not seem right.

Non-punitive response to error is the provider's perceptions of management's response to the reporting of error events in the healthcare system. This dimension is operationalized by three items in the HSOPSC: 1) Staff feels like their mistakes are held against them, 2) When an event

is reported, it feels like the person is being written up, not the problem and 3) Staff worry that mistakes they make are kept in their personnel file.

Feedback and communication about error are the provider's perceptions of the amount of information that is shared in relation to error events and follow-up processes in the healthcare system. This dimension is operationalized by three items in the HSOPSC: 1) We are given feedback about changes put into place based on event reports, 2) We are informed about errors that happen on this unit and 3) On this unit, we discuss ways to prevent errors from happening again.

Organizational learning is the provider's perceptions of organizational efforts to productively assess, evaluate, and implement quality and safety improvements based upon error events. This dimension is operationalized by three items in the HSOPSC: 1) We are actively doing things to improve patient safety, 2) Mistakes have led to positive changes here and 3) After we make changes to improve patient safety, we evaluate their effectiveness.

Unit teamwork is the provider's perceptions of the capacity of healthcare staff to respectfully and collaboratively work together in accomplishing work goals on the unit. This dimension is operationalized by four items in the HSOPSC: 1) People support one another on this unit, 2) When a lot of work needs to be done quickly, we work together as a team to get the work done, and 3) On this unit, people treat each other with respect and 4) When one area in this unit gets really busy, others help out.

Staffing is the provider's perceptions of the adequacy of staffing on units in relation to workload, patient safety, and quality care. This dimension is operationalized by four items in HSOPSC: 1) We have enough staff to handle the workload, 2) Staff in this unit work longer hours than is best

for patient care, 3) We use more agency/temporary staff than is best for patient care and 4) We work in “crisis mode” trying to do too much, too quickly.

Supervisor/Manager actions and expectations promoting safety include the provider’s perceptions of nursing unit management’s skill and consistency in promoting patient safety on the unit. This dimension is operationalized by four items in the HSOPSC: 1) My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures, 2) My supervisor/manager seriously considers staff suggestions for improving patient safety, 3) Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts and 4) My supervisor/manager overlooks patient safety problems that happen over and over.

Hospital management support for patient safety is the provider’s perceptions of hospital leadership in relation to creating a climate that consistently promotes patient safety within the healthcare system. This dimension is operationalized by three items in the HSOPSC: 1) Hospital management provides a work climate that promotes patient safety, 2) The actions of hospital management show that patient safety is a top priority and 3) Hospital management seems interested in patient safety only after an adverse event happens.

Teamwork across hospital units is the provider’s perceptions of the capacity of hospital units to work together cooperatively in the course of delivery of patient care. This dimension is operationalized by four items in the HSOPSC: 1) There is good cooperation among hospital units that need to work together, 2) Hospital units work well together to provide the best care for patients, 3) Hospital units do not coordinate well with each other and 4) It is often unpleasant to work with staff from other hospital units.

Hospital hand-offs and transitions dimension addresses the provider's perceptions of the quality and safety of exchanges of information when patients are transitioned between hospital units and departments and when patient care is handed over to another care provider during changes of shift on a unit. This dimension is operationalized by four items in the HSOPSC: 1) Things "fall between the cracks" when transferring patients from one unit to another, 2) Important patient care information is often lost during shift changes, 3) Problems often occur in the exchange of information across hospital units and 4) Shift changes are problematic for patients in this hospital.

Overall perception of safety addresses the provider's overall perceptions of safety on the hospital unit. This dimension is operationalized by four items in the HSOPSC: 1) Patient safety is never sacrificed to get more work done, 2) Our procedures and systems are good at preventing errors from happening, 3) It is just by chance that more serious mistakes don't happen around here and 4) We have patient safety problems in this unit.

Assumptions

The following assumptions provide a framework for this research:

1. The researcher will be able to capture the perceptions of Registered Nurses relating to patient safety culture.
2. The researcher assumes that the development of a positive safety culture is a prerequisite for generating optimally safe healthcare delivery environments for the patients in a healthcare system.
3. The researcher assumes that the individual willingness to report error, along with the reported incidence of error, are variables that are reflective of levels of safety in healthcare work environments.

4. The researcher assumes participants will be honest and forthcoming when responding to the self-administered survey.

Limitations

1. Hospital Survey on Patient Safety Culture (HSOPSC) staffing dimension may not be clearly reflective of the significance of staffing issues on KFMC units. Experts have recommended additional staffing items be developed for HSOPSC in order to more adequately sample factors that may influence nurse staffing in hospitals.
2. Participants were from one healthcare organization, which prevents generalizability to other organizations.
3. The unit or organizational patient safety culture may be the result of multidisciplinary efforts. This study is limited to the nurse population and may not adequately reflect the entire picture of patient safety culture in an organization.

CHAPTER 2

REVIEW OF THE LITERATURE

Concepts of Culture

The purpose of this research is to identify the systems factors that Registered Nurses (RN) perceive as contributing to a culture of patient safety and affecting participation and engagement in the patient safety culture at King Fahad Medical City (KFMC), Saudi Arabia. To understand the phenomenon of nurses' perceptions of patient safety culture, the literature on culture, organizational culture, organizational climate, safety culture, safety climate, patient safety culture, influences of demographic factors on the perception of patient safety culture, and patient safety culture dimensions affecting nurses' perceptions of patient safety were explored.

Culture is a very nebulous concept, yet it significantly impacts all aspects of any society; the same is true for culture's impact on organizations. Numerous attempts by researchers to define culture have resulted in diverse approaches, and the concept of culture has been viewed through many different lenses.

The term culture itself has its origin in cultivation and agriculture, coming from Middle English when the noun denoted "a cultivated piece of land." The word originally derived from the Latin cultura, meaning "growing, cultivation", and it is from this connotation of the word that, in the early 16th century, it became associated with the "cultivation of the mind, faculties, or manners". The American Heritage Dictionary defines culture as "the totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought characteristic of a community or population" (Boehmer, 2002, p. 217).

Today, the word as applied to organizational culture typically suggests something broader and more pervasive than intellectual or social improvement. Giroux states:

> Culture is partly defined as a circuit of power, ideologies, and values in which diverse images and sounds are produced and circulated, identities are constructed, inhabited, and discarded, agency is manifested in both individualized and social forms, and discourses are created, which make culture itself the object of inquiry and critical analyses. Rather than being viewed as a static force, the substance of culture and everyday life- knowledge, goods, social practices, and contexts – repeatedly mutates and is subject to ongoing changes and interpretations. (2004, p. 60)

While Robbins (2003) defines culture as consisting of seven primary characteristics: innovation and risk-taking, attention to detail, outcome orientation, people orientation, team orientation, aggressiveness, and stability, he also refers to culture as a system of shared meaning held by members, a system that distinguishes one organization from other organizations.

Schein (1992) defines culture as "the accumulated shared learning of a given group covering behavioral, emotional and cognitive elements of the group members total psychological functioning" (p. 10). Schein (2004) added that culture is a dynamic phenomenon and a set of structures and routines. He described the former as being continuously performed and shaped by our interactions with others and influenced by leadership behavior. Culture is also seen as a set of basic tacit assumptions, about how the world is and ought to be, which a group of people share and which determines their perceptions, thoughts, feelings, and to some degree, their overt behavior (Deal & Kennedy, 1999; Schein, 1999; Waters, 2004). The prime function of culture is to contribute to an organization's success. Thus, organizational culture is widely acknowledged to be critical to an organization's success or failure. In the next section, the organizational culture construct will be covered.

Organizational Culture

Organizational culture is not consistently described in the literature. Multiple definitions of organizational culture exist, with many of them centering on enduring attributes of culture such as values, assumptions, and beliefs. Organizational culture gives a sense of what is valued and how things should be done within an organization (Scott-Findlay & Estabrooks, 2006). The concept of organizational culture has its roots in several disciplines, including psychology, sociology, anthropology, and management. These diverse perspectives result in numerous and conflicting approaches to defining organizational culture (Cooper, 2000; Schein, 1990; 1992).

According to Verbeke, Volgering, and Hessels (1998), there are 54 different definitions for the concept of organizational culture. The term 'organizational culture' was first addressed by Pettigrew in 1979. However, the concept was described as early as 1948 when Selznick pointed out a major part of the concept of the organizational culture in his paper "*Foundations of the Theory of Organization*." He mentioned that the central viewpoint of organization as a formal system could not explain its internal informal cooperation system that is based on unwritten laws between members in the organization and that functions to control group relations and influence organizational decisions.

Scott (1987) used a different scope and defined organizational culture as both an external variable and an internal variable. The external culture describes the external environment in which the organization is located. The internal culture characterizes the value and style of the organization. This definition is based on the organizational theory of open systems and describes the exchange of internal and external environments of an organization. The unique portion of this definition that differs from other organizational culture definitions is the consideration of societal influence on organizational culture. Schien (2004) concluded that there are 11 major categories

of organizational culture definitions: (1) observed behavioral regularities when people interact, (2) group norms, (3) espoused values, (4) a formal philosophy, (5) rules of game, (6) climate, (7) embedded skills, (8) habits of thinking, mental models, and linguistic paradigms, (9) shared meanings, (10) root metaphors and (11) formal rituals and celebrations. The common point of these concepts is a shared mindset or behavior style among group members, but none of these definitions alone can fully describe organizational culture.

Guldenmund (2000) summarizes organizational culture as consisting of the following seven characteristics: (1) holistic construct, (2) stable, (3) multidimensional, (4) shared by national culture, corporate culture, organizational culture, departmental culture, group culture and psychological climate, (5) various aspects (different cultures such as safety culture), (6) practices (norms and values, ritual, heroes and symbols) and (7) functional - the way we do things around here.

In summary, the most cited definition of organizational culture is Schien's definition written in 1985. He defined organizational culture as:

> A pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with 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. (p. 9)

Schein (2004) modified his definition of organizational culture by emphasizing the concepts of 'shared' assumptions among group members and learning organization, stating that organizational culture may be defined 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. (p. 17)

Perspectives of organizational culture

There are two strong and opposing perspectives on organization culture; the "functionalist perspective" working within a "modern paradigm", and the "symbolic perspective" reflecting the "postmodern paradigm". The functionalist perspective often associated with Schein (1985) states that culture works as a function toward the survival of the organization and as an integrating mechanism. In this understanding, culture needs to be consensus driven and normative in order to make the organization work effectively. Traditional functionalists consider culture to be a "variable" on the same line as structure, tasks, and technology that can therefore be measured as either "good" or "bad". According to some, functionalist organizational culture can be manipulated by the members of the organization. In contrast, the symbolists highlight culture as something that is integrated in all social structures. The symbolist, in accordance with postmodern thinking, believes that culture is relative and cannot be controlled or fully captured. Culture is believed to be the representation of language, myths, and metaphors that are under constant negotiation by the members of the organization (Hatch, 1997).

Levels of Organizational Culture

Many definitions of culture give primacy to cognitive components such as assumptions, beliefs, and values. Others expand the concept to include behaviors and artifacts, leading to a common distinction between the visible and the hidden levels of organizational culture. In

contrast to the distinction between the visible and hidden levels, some theorists distinguish multiple levels. Schein (2004), one of the foremost experts in the area, identifies the following levels: artifacts, espoused beliefs and values, and basic underlying assumptions. He suggests the majority of clues to an organization's culture available to an observer are artifacts, which are the visible overt behavior, opinions, and feelings of organizational members. However, regarding artifacts, Schein (2004) writes, "The most important point to be made about this level of the culture is that it is both easy to observe and very difficult to decipher" (p. 26). He also writes that espoused beliefs and values "…are various espoused beliefs, values, norms, and rules of behavior that members of the culture use as a way of depicting the culture to themselves and others" (p. 25). However, Schein (2004) posits that basic underlying assumptions are the keys to understanding and changing organizational culture, since these assumptions support the accepted values of an organization. Therefore, he proposes that through his model researchers seek cultural understanding by exploring all levels of an organization's culture. More than one culture or climate can exist within an organization. For example, professional groups such as nurses and physicians bring different and often competing sets of norms and values to their work (Flood & Fennell, 1995). These professional cultures interact with the culture of the organization as a whole. Similarly, for-profit and not-for-profit hospitals may differ in how they motivate and evaluate the performance of health care professionals.

Organizational Climate

Climate was described in the organizational literature almost 20 years before the culture construct was imported into the study of organizations (Reichers & Schneider, 1990). The first writings on climate began in the late 1930s, but the bulk of the research began in the 1960s, exploring the relationship between organizational climate and work productivity and

motivation. This large body of writing lacked a consistent clear conceptual definition (Reichers & Schneider, 1990). The concept of organizational climate has its roots in Lewin's (1951) studies of experimentally created social climates, which view the social world as three components comprising behaviors, the environment, and the person. The person, by definition, is analytically separated from the social context. The subjects of the social system, most often employees, are the primary focus of climate studies. Concerned with the impact that organizational systems have on groups and individuals, climate is reflected in members' overall perceptions and sense making of policies, practices, goals, and goal attainment in an organization. Thus, climate research focuses on aspects of the environments that are consciously perceived by organizational members (Hall, 2005).

Organizational climate is conceptualized as a psychological approach focusing on the individual and seeking to understand the cognitive processes and behavior. The organizational climate, broadly speaking, is related to the work atmosphere, which consists of methods of organizational functioning undertaken by the organizational members. It has been widely defined as the shared perceptions of employees regarding organizational functioning and practices (Yahyagil, 2006). Organizational climate is defined 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 (Campbell, Dunnette, Lawler & Wick, 1970). Climate has been described as "the way things are around here" and represents the "shared perceptions of organizational policies, practices, and procedures, both formal and informal" (Reichers & Schneider, 1990, p. 22). Organizational climate is reflected in members' overall perceptions of policies, practices, goals, and methods of goal attainment in an organization. Climate represents how things are done and the way things are in an organization (Reichers & Schneider, 1990). Organizational climate

perceptions are seen as crucial determinants of individual behavior in organizations by mediating the relationship between objective characteristics of working conditions (organizational policies, practices, and procedures) and an individual's working behavior (Campbell, et al., 1970).

Schein's definition of the climate concept is "the feeling that is conveyed in a group by the physical layout and the way in which members of the organization interact with each other, with customers, or with other outsiders" (1992, p. 9). Hellriegel and Slocum (2001) asserted that organizational climate refers to the perceptions about an organization that may be deduced from the way the organization deals with their employees and environment. Peterson and White (1992) presented another view of organizational climate; they defined organizational climate as the common patterns of an institution and its employees' perceptions of and attitudes toward the institution. They emphasized that the climate of an organization is a shared sense of how members perceive their roles in their institution and how members feel about their institution. Additionally, Peterson and White reported that, as institutional change occurs, perceptions of the climate of an organization often change as a result.

Dimensions of Organizational Climate

Litwin and Stringer (1968) conceptualized and operationalized climate by presenting six dimensions reported by organizational member perceptions. Their studies were rigorously designed, and the dimensions they proposed are widely used by climate researchers. They used the term "dimension" as an aid in visualizing and conceptualizing the construct. The dimensions they isolated and defined center on an organizational task or a group of tasks. These dimensions are structure and constraint, emphasis on individual responsibility, warmth and support, reward and punishment / approval and disapproval, conflict and tolerance for conflict, and performance standards and expectations. Perceptions of climate are assumed to act as a psychological utility,

which serves as a frame of reference for guiding appropriate behavior (Schneider, 1975). In other words, the events in the organization, as observed by the individual, can serve as signals which indicate the key priorities that are valued by the organization. Therefore, climate is considered to be a perceptual medium through which the effects of the organizational context are translated into the employee's behavior. Climate has been described as an experientially based description of the work environment and, more specifically, employees' perceptions of the formal and informal policies, practices, and procedures in their organization (Schneider, 2000).

There are two distinct approaches to the study of organizational climates:

1. The individual unit of analysis, measuring the group member's perception, interpretation, personal meaning, and valuation of the organization's attributes. Organizational climate in this approach is considered to be an individual attribute and is also called psychological climate.
2. The organizational unit of analysis, using the employees' collective perceptions and interpretations of the organization's attributes. In this perspective, organizational climate is considered to be an organizational attribute (Brown & Leigh, 1996).

James and Jones (1974) reviewed all the previous relevant research, definitions, conceptual frameworks, and measurement approaches and differentiated them into three principal categories. According to them, all the major theoretical concerns and relevant research related to organizational climate can be divided into three approaches: perceptual measurement-individual attribute approach, multiple measurement-organizational attribute approach, and perceptual measurement-organizational attribute approach.

Perceptual measurement-individual attribute approach: this approach is named as psychological climate. Psychological climate refers to the perceptual and experiential

components of a reciprocal interaction between the organizational environment and the employee (Michela, Lukaszwski & Allegrante, 1995). It has been conceptualized as a construct ‘‘comprising an individual’s psychologically meaningful representations of proximal organizational structures, processes, and events’’ and as ‘‘a means of explaining an individual’s motivational and affective reactions to change’’ (Parker et al., 2003, p. 390).

Multiple measurement-organizational attribute approach and perceptual measurement-organizational attribute approach are characterized as organizational climate. Just as an organization has multiple cultures, multiple climates may also exist, such as a climate for service, caring, teaching, or safety (Schneider, Bowen, Ehrhart & Holcombe, 2000; Zohar, 1980). In summary, organizational climate is the characteristic behavioral processes in an institution at one particular point in time.

Similarities Between Organizational Climate and Organizational Culture

Organizational climate and organizational culture share the common ground of trying to describe and explain the relationships that exist among groups of people who share some sort of common situations/experiences (Payne, 2000). Denison (1996) thoroughly reviewed the historical, theoretical, and research traditions of the organizational climate and organizational culture constructs and found that differences were more a matter of perspective than substance.

Both constructs are multidimensional and associated with the ways in which people make sense of their environment. Both perspectives attempt to address the problem of social contexts simultaneously being the product of individual interaction and a powerful influence on individual interaction (Denison, 1996). In addition, both climate and culture are transmitted through socialization processes for new employees. Both are also concerned with identifying how the environment affects people’s behavior (Reichers & Schneider, 1990). When the culture

researchers would choose to describe culture in terms of comparative traits or dimensions, the content of the culture domain begins to take a strong resemblance to the topics that climate researchers have been concerned with for decades (Denison, 1996). Finally, both constructs can vary in terms of their strength, meaning their ability to drive individual behavior and organizational outcomes (Payne, 2000). Table 1 highlights similarities between organizational culture and organizational climate.

Table 1

Similarities Between Organizational Climate and Organizational Culture

Relationships	To describe the relationships that exist among groups of people who share some sort of common situation/experiences.
Dimension	Both constructs are multidimensional and associated with the ways in which people make sense of their environment.
Social contexts	Both perspectives attempt to address the problem of social contexts
Behavior	Identifying how the environment affects people's behavior.
Socialization	Transmitted through socialization processes for new employees.

Differentiation Between Organizational Climate and Organizational Culture.

The primary difference between organizational culture and organizational climate lies in the focus of culture being on shared values and assumptions and the focus of climate being on perceptions, shared or not. In addition, individuals' personalities, needs, abilities, job satisfaction, and goals directly affect their perceptions of the work environment. Culture and climate both emerged from the social sciences but have different theoretical bases. The concept of culture arose from anthropology and the study of social systems, while climate emerged from social psychology, where it was assumed possible to separate the effect of individual actions and the environment on behavior (Denison, 1996). Culture, therefore, is concerned with evolving social systems (Glendon & Stanton, 2000), while climate examines the impact of organizational systems on individuals and groups (Denison, 1996). Culture is frequently defined as the shared and taken-for-granted values, beliefs, norms, meanings, assumptions, myths, and rituals of a group that result from socialization processes within an organization (Glendon & Stanton, 2000; Reichers & Schneider, 1990; Scott, Mannion, Davies, & Marshall, 2003). Culture is thus an

abstract construct that is embedded in an organization and is relatively resistant to change (Denison, 1996; Guldenmund, 2000). Culture has been suggested as "a metaphor for understanding how organizations work and why they respond in particular ways to environmental influences" (Glendon & Stanton, p. 195). Organizational climate, on the other hand, is linked to situations and how they are experienced by workers; thus, climate may change more easily than culture (Denison, 1996).

Differences exist between the research methodologies used to study organizational culture and climate. Because the two constructs arise from different research traditions, the goals of research in the two traditions vary (Denison, 1996; Guldenmund, 2000; Reichers & Schneider, 1990). As a result, methods of studying the two constructs differ, with a qualitative approach used to investigate culture and a quantitative one used to examine climate. Observation, interviews, ethnographic, and case studies are the methods of culture research, while cross-sectional surveys are the norm in climate research. Culture investigations are concerned with providing thick, rich descriptions that promote understanding, while effectiveness is the issue in studies of organizational climate (Reichers & Schneider, 1990). Climate studies take a comparative approach, while culture investigations avoid comparison and take a postmodern tactic that emphasizes understanding social contexts. Climate, with its origins in the Lewinian social psychology and hence a positivist paradigm, employs questionnaires to directly assess member perceptions of organizational events but does not attempt to interpret the meaning of those events (Rentsch, 1990). However, now that organizational culture studies are using quantitative methods of survey data collection, the research is becoming virtually indistinguishable from climate studies. For example, Cooke & Rousseau (1988) used a quantitative approach to assess a specific aspect of organizational culture, the shared norms and

expectations that guide the thinking and behavior of members. The measurement instrument utilized in this study was the Organizational Culture Inventory (OCI), which is designed to be used for intra- as well as inter-organizational comparisons in research and for promoting cultural change through survey-guided organization development programs.

Ironically, culture researchers originally ignored quantitative methodologies, stating that quantitative methods were unable to uncover the true meaning of the culture (Denison, 1996). Sleutel (2000) used *emic* and *etic* perspectives to differentiate culture and climate and proposed using quantitative methodology for the study of climate and qualitative methodology for the study of culture. However, as more and more studies are using the quantitative method to provide evidence of organizational culture, Sleutel's (2000) suggestion of *emic/etic* differentiation on research methodology becomes inadequate. Reichers and Schneider (1990) also support this viewpoint and suggest that shared meaning and assumptions can be accurately assessed by the quantitative methodology. Some culture investigators have used triangulation methods. On the other hand, some climate researchers have taken a qualitative approach. For example, Nicklin & McVeety (2002) conducted a study to explore Canadian nurses' perceptions of patient safety in hospitals. The authors used focus groups and interviews to conduct the research over a three-month time frame. Denison (1996) notes that investigators frequently remain committed and devoted to the research tradition of their construct. Table 2 highlights the differences between organizational climate and organizational culture.

Table 2

Differences between Organizational Culture and Organizational Climate

Focus	Organizational Culture	Organizational Climate
Concern	Shared Values & Assumptions	Perception
Orientation	Description of one organization	Comparison of organizations
Theoretical Foundation	Social construction	Lewinian theory
Philosophical perspective	Postmodern paradigm	Positivist paradigm
Point of view	Emic point of view	Etic point of view
Methodology	Qualitative field work	Quantitative survey
Time perspective	Evolving social system	Impact of organization system (snapshot)
Discipline	Anthropology and Sociology	Psychology

Safety Culture

The term safety culture was introduced by the International Atomic Energy Agency (IAEA) as a result of their first analysis into the nuclear reactor accident at Chernobyl (Lee, 1998). A number of definitions have been developed since that time. There are two dominant definitions of safety culture. The first definition, developed by the IAEA in the context of the Chernobyl disaster, defined safety culture as '…assembly of characteristics and attitudes in organizations and individuals which established that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance' (IAEA, 1991; p. 1). The second dominant definition of safety culture was developed by the Advisory Committee on the Safety of Nuclear Installations (ACSNI), which states:

> The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures. (HSC, 1993; p. 23)

Wiegmann, Zhang, von Thaden, Sharma & Gibbons (2004) report thirteen different, yet complementary, definitions of safety culture. The commonalities across these definitions include the following: (1) Safety culture is a concept defined at the group level or higher, which refers to the shared values among all the group or organization members; (2) Safety culture is concerned with formal safety issues in an organization and is closely related to, but not restricted to, the management and supervisory systems; (3) Safety culture emphasizes the contribution from everyone at every level of an organization; (4) The safety culture of an organization has an impact on its members' behavior at work; (5) Safety culture is usually reflected in the contingency between reward systems and safety performance; (6) Safety culture is reflected in an organization's willingness to develop and learn from errors, incidents, and accidents and (7) Safety culture is relatively enduring, stable, and resistant to change.

Understanding the safety culture of an organization, work site, or work-group as a whole may be difficult, but identifying and understanding the dominant safety norms may be a more manageable method of attending to specific issues. A safety culture is a subset of the organization's overall culture. It identifies the actions of the organization and its members. It defines the characteristics and attitudes of the members which determine how members' actions

impact their safety. A safety culture is the shared set of beliefs and attitudes by employees concerning the prioritization of safety issues and the maintenance of safe working conditions within the organization.

Safety Climate

The concept of safety climate was first proposed by Zohar (1980), who defined it as "…a summary of molar perceptions that employees share about their work environments" (p. 96). Yule, Flin & Murdy (2001) defined safety culture as the product of employee perception and attitudes about the current state of safety initiatives at their place of work.

Safety climate contributes to the organization's underlying safety culture through employee safety behaviors and expressed attitudes (Mearns, Whitaker & Flin, 2001). Furthermore, safety climate can be thought of as the measure of safety culture derived from the attitudes and behavior of the organization's members at a point in time (Flin, Mearns, O'Connor & Bryden, 2000). An operational definition of safety climate is that it includes the collective attitudes and behaviors associated with the state of safety at a particular moment. Safety climate is relatively unstable and subject to change, depending on current conditions, and is considered a temporal state of measure of safety culture.

Wiegmann, et al. (2004) reported commonalities across the definitions of safety culture, including the following: (1) Safety climate is a psychological phenomenon, which is usually defined as the perceptions of the state of safety at a particular time; (2) Safety climate is closely concerned with intangible issues, such as situational and environmental factors and (3) Safety climate is a temporal phenomenon - a "snapshot" of safety culture -that is relatively unstable and subject to change. The safety climate of an organization is the perception of the members of the organization, as well as external observers, as to how the organization behaves and reacts to

safety issues that confront the organization; it is, therefore, a view of how people perceive the organization.

Safety Culture and Climate Differentiated

Despite agreement that culture and safety are related, there has been disagreement among researchers about the terms safety culture and safety climate. Cox and Flin (1998) claim that as a concept, culture has no clear definition or measurement. Furthermore, they contend that although safety climate has often been used interchangeably with culture, the distinction between them is one of belief versus practice, stating that "climate reflecting attitudes, perception, and beliefs while culture is more complex, reflecting values and norms and being evident in safety management practices" (p. 19). Cheyne, Oliver, Tomas, & Cox (2002), however, make no distinction between safety culture and safety climate, and they maintain that the terms can be used interchangeably. According to Guldenmund (2000), a distinction can be drawn between safety climate and culture, with the former represented by safety attitudes and the latter represented by strong convictions or dogmas that underlie safety attitudes. He reviewed the literature about safety culture and safety climate and contended that the current literature of safety culture and safety climate has shown the following:

1. The concept of safety culture and safety climate are still ill-defined and not well worked out; the relationship between them is unclear.
2. There is a considerable confusion about the cause, the content, and the consequences of safety culture and safety climate; i.e.:
    - the cause of safety culture and safety climate has not been addressed seriously
    - there is no consensus on the content of safety culture and safety climate
    - the consequences of safety culture and safety climate are seldom discussed

3. There is no satisfying model of safety culture or safety climate.
4. The issue, level of aggregation, has not received the attention it warrants.

Zhang, Wiegmann, von Thaden, Sharma, and Mitchell (2002) emphasize the temporal distinction between the terms, viewing safety culture as the enduring value and priority placed on worker and public safety by everyone in every group at every level of an organization. It refers to the extent to which individuals and groups will commit to personal responsibility for safety, that is, act to preserve, enhance and communicate safety concerns. On the other hand, safety climate is viewed as the temporal state of measure of safety culture subject to commonalities among individual perceptions of the organization. It is, therefore, situationally based, refers to the perceived state of safety at a particular place and time, is relatively unstable, and is subject to change depending on the features of the current environment or prevailing conditions. Generally, safety culture is viewed as a more embracing concept than safety climate. While safety culture is considered a special kind of organizational culture that is focused on safety and inherits the complex nature of organizational culture (Guldenmund, 2000), safety climate is usually viewed as the safety attitudes of the members of the organization and as the surface manifestations of safety culture (Flin, et al., 2000). It is also commonly accepted that safety climate provides an indicator of the underlying safety culture (Cox & Flin, 1998).

Patient Safety Culture

Patient safety culture is a subset of organizational culture relating specifically to the values and beliefs concerning patient safety (Feng, Bobay & Weiss, 2008). Kizer (1998) defines a patient safety culture as the "shared beliefs and values about the healthcare delivery system with patient safety in mind" (p. 31). Mustard (2002) defines the patient safety culture as "a product of social learning; ways of thinking and behaving that are shared and that work to meet

the primary objective of patient safety" (p. 112). Nieva and Sorra (2003) define safety culture as a "performance shaping factor that guides the many discretionary behaviors of healthcare professionals towards viewing patient safety as one of the highest priorities" (p. 17).

According to the Association of Perioperative Registered Nurses (AORN) (2006), patient-centric safety culture consists of five major subcultures: reporting, flexible, learning, wary and just. Reporting culture is a culture in which all members of the team readily report errors and near misses. A reporting culture can be assessed by the types of errors reported by staff. As the safety culture matures, there is increased risk-taking associated with errors reported. In a true reporting culture, individuals report events in order to allow all staff members in the organization to learn from the experience. A flexible culture is a culture that is nimble enough to keep pace with the rapid changes in health care. A learning culture is a culture that is capable and ready to gain knowledge from experiences and data and is willing to implement major changes as indicated from safety information systems. A learning culture is informed and learns from incidents and near misses. A wary culture is a culture in which all the members of the team are continually aware of the unexpected. Being vigilant is a healthy state that is a combination of being informed and aware that, at any given moment, an untoward event can occur. A just culture is a culture that provides an environment of trust, where all members of the team are encouraged to provide safety-related data and are acutely aware of the distinction between acceptable and unacceptable behavior. Errors and mistakes must be evaluated in a manner such that contributing factors are reviewed first, and then accountability is determined in relation to actions (AORN, 2006).

To summarize, after reviewing the organizational culture and organizational climate constructs, it appears that the distinction between culture and climate is not sharp. Rather, it is

largely related to somewhat different research traditions. Culture theorists tend to apply qualitative methods, and climate theorists will typically apply quantitative methods including, in particular, questionnaire survey techniques. The debate about the distinction between climate and culture has not been made any clearer by the fact that neither notion has anything that looks like a standard definition. However, the exact distinction between culture and climate remains a matter of debate in the organizational studies literature (Ashkanasy, Wilderom & Peterson, 2000).

The purpose of this study is to investigate the nurses' perceptions about patient safety at the hospital setting. It can be argued that patient safety perceptions can be studied using either a culture-based approach or a climate-based approach. The two terms were used interchangeably in this study. However, it is strongly believed that the climate-based approach is the more appropriate approach. The following section explains the reasons behind choosing the climate-based approach to study the patient safety from nurses' perceptions.

Organizational climate appears to be closer to operations, and is characterized by day-to-day perceptions concerning the working environment, working practices, organizational policies, and management. These dimensions were the core of this study. According to Payne (2000), organizational climate provides a useful description of a single organization and even more useful comparison with other organizations. This study aims to describe the perceptions of registered nurses at King Fahad Medical City (KFMC), which is considered to be a single organization. In addition, KFMC consists of four large 'hospitals' with a total of 1159 beds, so it will be useful to draw comparisons between the hospitals. This study was a cross-sectional survey designed to examine nurses' perceptions of the existing climate of patient safety at KFMC. A cross-sectional design was used because there is a lack of prime results regarding

patients' safety climate in Saudi hospitals, and the result of this proposed research will provide a baseline for patient safety practice in Saudi hospitals. Survey research is one of the most common methods used to conduct quantitative research, which is the typical approach to studying organizational climate. Traditionally, organizational climate aims to capture a snapshot of an organization at one point in time. Therefore, this study was designed to provide a snapshot of how nurses perceive patient safety at a specific time.

Influences of Demographic Factors on the Perception of Patient Safety Culture

Some major demographic variables do appear to influence the nurse's perception of patient safety culture. These significant variables include work experience (Yoon & Cho, 2004; Lim & Yi, 2004; Cho & Jeong, 1999; Hamers, Abu-Saad & Halfens, 1994; Lamond, Crow, Chase, Doggen & Swinkels, 1996). Ingersoll, Wagner, Merck, Kirsch, Hepworth & Williams (2002) found that educational background influenced nurse's perceptions about patient safety culture, but Kratina (1990) suggested no difference in perception of patient safety culture between nurses with different educational levels. The influence of the type of nursing unit on nurse's perception of patient safety culture is controversial across studies. Ingersoll, et al. (2002) found different perceptions across departments. Nurses working in surgical units perceived a higher level of supportive culture than those working in critical care units (Kratina, 1990). The step-down units scored the highest on both aggressive-defensive and the passive-defensive cultures (Seago, 1996). Wright (1992) claimed that nurses working in different nursing units perceived organizational climate differently. Mayo (2004) reported that nurses from different work settings presented different perceptions to three subscales of organizational climate: autonomy, workload stress, and interpersonal interaction.

The ethnicity of nurses was found to influence the perception of the organizational culture. Nurses of color were prone to perceive the hospital culture as approval, avoidance, and competitive (Seago, 2000). Caucasian nurses perceived less managerial control than non-Caucasian nurses (Staten, Mangalindan, Saylor & Stuenkel, 2003). There was no difference in perception of managerial control between the Filipino/Asian and non-Filipino/Asian nurses (Staten, Mangalindan, Saylor & Stuenkel, 2003). On the other hand, some demographic variables do not appear to influence the nurse's perception of patient safety culture. These nonsignificant variables include age (Kratina, 1990; Hoffman, Donoghue & Duffield, 2004; Staten, Mangalindan, Saylor & Stuenkel, 2003) and gender (Hoffman, Donoghue & Duffield, 2004; Seago, 2000).

Dimensions Affecting Nurses' perceptions of Patient Safety

A significant number of dimensions related to patient safety in healthcare organizations and affecting nurses' perceptions of patient safety are explored in the literature reviews (Feng, Bobay & Weiss, 2008; Flin, 2007; Flin, Mearns, O'Connor & Bryden, 2000; Guldenmund, 2000; Flin, Burns, Mearns, Yule & Robertson, 2006; Singla, Kitch, Weissman & Campbell, 2006; Sorra & Nieva, 2004).

Sorra & Nieva (2004) conducted a pilot test through a hospital survey on patient safety culture, which tested 1,437 hospital employees from 21 hospitals in the United States. The authors found a significant number of dimensions related to patient safety in healthcare organization, as follows: communication openness, feedback and communication about error, handoffs and transitions, management support for patients, non-punitive response to errors, organizational learning, staffing, supervisor/manager expectations and actions promoting safety, and teamwork across and within the organization.

Flin and colleagues (2000) examined 18 safety culture and climate instruments used in the industry and then extracted the following dimensions: management/supervision (especially in relation to perceived commitment to safety), safety system (procedures, practices, and equipment), risk (attitudes to risk taking), work pressure (work place production vs. safety), competence (knowledge, skills, training), and procedures/rules. Flin and associates (2006) identified similar dimensions in safety culture within health care organizations, which included: management/supervisors, safety systems, risk perception, job demands, reporting/speaking up, safety attitudes/behaviors, communication/feedback, teamwork, personal resources (e.g. stress), and organizational factors.

Singla, Kitch, Weissman and Campbell (2006) developed a list of safety culture dimensions which have been proposed in the literature and include: (1) management and institutional commitment to safety, (2) overall perception of safety, (3) frequency of event reporting, (4) organizational learning, (5) teamwork, (6) communication openness, (7) feedback and communication about errors, (8) non-punitive response to errors, (9) staffing, (10) management support for patient safety, (11) handoffs and transitions, (12) working conditions, (13) stress recognition, (14) job satisfaction, (15) hazard detection and (16) measuring safety.

Feng, Bobay & Weiss (2008) analyzed the concept and dimensions of patient safety culture. The authors reviewed 45 papers, three books, and three theses to analyze the dimensions of patient safety culture. The four sub-dimensions of patient safety culture were synthesized as the system sub-dimension, the personal sub-dimension, the task-associated sub-dimension and the interactive sub-dimension. The two major components of system sub-dimension of patient safety culture are system integrity and management support. The two attributes of patient safety culture at the personal level are personal competence and personal commitment. The task-

associated sub-dimension includes the nature of the task, task complexity, work environment characteristics, and feasibility of implementation; and the interactive sub-dimension includes communication and partnership. In the following section, these dimensions are explored in detail.

Leadership Support for Patient Safety

Leadership support for patient safety plays an important role in the approach to understanding errors and patient safety. Leadership support for patient safety is critical for a successful program and is evident in the type of resources allocated, the analysis of processes, the implementation of changes, the response to error reporting, and the use of evidence-based practice (Byers & White, 2004). Senior leaders have both the responsibility and the authority to position safety as a strategic priority in an organization. If safety is to be seen as a strategic priority for all staff, then leadership must make it a key focus of their attention.

Support from the leader is an important aspect of creating and shaping patient safety in the work environment. Safety values can be conveyed to group members by the leaders communicating that patient safety is the first priority. Organizational leaders can promote patient safety by articulating shared values, modeling appropriate behaviors, and establishing expectations for staff (Stevens & Mattow, 2006). However, words alone are an ineffective leadership tool. Effective leaders "walk the walk" and achieve safety by modeling the behavior that is expected of their membership. Given the comprehensive changes that will be necessary to bring about patient safety, now more than ever, good leadership from both clinical and non-clinical arenas is an essential prerequisite to transforming an organization’s safety (Spath, 2000). Improvement in safety does not occur unless there is a commitment by the organization’s governing body and senior management and an overt, clearly defined, and ongoing effort on the

part of hospital leaders, physicians, managers, and employees to sustain the organization's interest and focus on patient safety. Management must 'manage' for patient safety just as they manage for efficiency and profit maximization. Additionally, safety must become part of the standard upon which a hospital or health care organization prides itself (Leape & Berwick, 2005).

Characteristics of an organization with a pervasive commitment to patient safety include how the organization articulates patient safety as a specific aim and then determines how to translate that goal into processes and procedures supporting the delivery of patient care. Also, the organization establishes patient safety programs with defined executive responsibilities supporting strong, clear, visible organizational commitment and attention to safety. Meaningful safety programs should include senior-level leadership, defined program objectives and plans, dedicated personnel resources, a budget, collection and analysis of data, and monitoring of progress to key board committees and the board of directors (Pennsylvania Patient Safety Collaborative, 2009).

Leadership safety rounds, in which senior leaders meet with staff in front-line areas to discuss safety concerns, are another element that can be incorporated to enhance the patient safety in organizations (Frankel, Graydon-Baker & Neppl, 2003). Aiken and colleagues (2002) found that the lack of organizational and managerial support for the nurses produced negative consequences such as dissatisfaction with the job and burnout. In contrast, hospitals with the most organizational and managerial support reported less dissatisfaction and burnout, which ultimately positively affects the safety of the patients. The setting for this study was in adult acute care hospitals in Pennsylvania, Canada, England, and Scotland. There were 10,319 nurses working on medical and surgical units in 303 hospitals across these various locations.

Nurse leaders from the bedside to the boardroom in health care organizations must lobby to ensure that patient safety is the key focus on the healthcare delivery and policy agenda and that it is supported by vision, policies, strategies, practices, and resources. The IOM report, "*Keeping Patients Safe*" (2004), indicates that when leaders are committed to patient safety practice, the result is a safer environment for the patients as well as an equal balance between safety and production. Nurses are fully engaged in the process of detecting high risk situations before errors occur. Leadership commitment is evident in actions such as ensuring safety training across all levels, developing a strategic safety plan and providing safety policies and procedures that clearly delineate accountability, including patient safety as a standing agenda item at meetings, encouraging a questioning approach by staff, monitoring safety trends, recognizing the contributions of safety achievers at the front line, and establishing short term safety goals.

Hospital leadership benefits patients in a number of ways. Leaders who set an example of focusing on patient safety will create a workplace where safety consciousness is the norm. It takes leaders promoting it and encouraging and rewarding nurses who improve it to make awareness of patient safety part of the structure of a unit. Leaders must make the case for patient safety. Discussing adverse events that have occurred in the institution is one way to make the case. Leaders also can do this by highlighting the gap in the organization's performance between where it is and where it needs to be (Botwinick, Bisognan & Haraden, 2006).

In conclusion, developing and transitioning to a culture of safety requires strong, committed leadership by executives, hospital boards, and staff. According to the IOM, the essential elements of an effective safety culture include the commitment of leadership to safety and empowering and engaging all employees in ongoing vigilance through communication,

nonhierarchical decision making, constrained improvisation, training, and rewards and incentives (IOM, 2004).

Communication

Communication is one of the key areas that healthcare organizations should maintain in order to create a safe environment for patients. The ability to transmit information between patients and providers and among caregivers is central to the provision of safe, quality, medical and nursing care. Frequent and open communication between caregivers and across organizational levels has been set forth as a key characteristic of patient safety practice (Singer, Gaba, Geppert, Sinaiko, Howard & Park, 2003). Communication failures are the root cause of the majority of malpractice claims and major patient safety issues, including errors resulting in patient death. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO, 2007) has found communication failures to be the primary root cause of more than 60% of sentinel events reported.

Bender (2000) notes the problems of errors between care settings and argues that a major factor is the inherently greater complexity of health care compared with other industries. Poor communication between and among health care providers and patients are one of the consequences of complexity leading to errors. Gui, Cheruvu, Subak-Sharpe, Shiew, Bidlake & Fiennes (1999) discuss weaknesses in communication between hospitals and general practitioners after day case surgery and point out that they often lead to patient safety problems. Cook, Render and Woods (2000) argue that fragmentation leads to poor continuity of care and assert that this is a major cause of problems of patient safety. Parisi (2003) emphasized the importance of correct communication of patient identifiers. She noted that many health care facilities have had difficulties in developing standard methods of identification for various

reasons, including an underestimation of the risks. Nicklin and McVeety (2002) conducted focus groups comprised of Canadian nurses and found they were overwhelmingly of the view that risks to patient safety were increasing. The main factors were increased workloads and nursing shortages, and communication problems between clinical professions and with patients.

Communication breakdowns in healthcare occur in various ways. For example; there can be communication failures during patient handoffs (i.e., transfer of responsibility for patients between caregivers, such as during a change of shift or upon patient discharge from the hospital). Communication breakdowns can also occur within the team of caregivers treating a patient in a particular setting (i.e., the operating room), between a patient's attending physicians and consulting physicians, or even between the physician and the patient. On the other hand, organizations with a positive safety practice are characterized by communications founded on mutual trust (Cooper, 2000). Improving the effectiveness of communication among caregivers is one of the National Patient Safety Goals and it is a requirement for organizations seeking accreditation by JCAHO. Addressing defects in communication, which affect collaboration, information exchange, appreciation of roles and responsibilities, and direct accountability for patient care, are key components of any patient safety program.

Achieving positive patient safety requires effective channels for top-down, bottom-up and horizontal communication on safety matters. With regard to top-down communication, effective communication from management to staff is the key to providing successful health and safety leadership. This can be achieved through a visible safety policy statement and newsletters or memos describing safety news, safety issues, and major accident risks. As concerns safety reporting, communicating a problem or concern is only one step on the route towards ideal patient safety. Feedback mechanisms should be in place to respond to the reporter (if required)

concerning any actions taken. In the case of horizontal communication, the organization should provide a system for the effective transfer of information between individuals, departments, and teams. In practice, appropriate safety information should be available when required (Feng, Bobay & Weiss, 2008). Communication plays a significant role in all aspects of error. Firstly, improving the quality of communication among health-care workers and between patients and health-care workers can help prevent errors. Secondly, good communication is imperative when dealing with errors once they have occurred. Changing the way healthcare professionals communicate is a daunting task because it impacts organizational culture and individual style. However, this change is a necessary one in order to advance the work of patient safety.

At the 2006 Agency for Healthcare Research and Quality Patient Safety and Health Conference, Elizabeth Dayton and Kerm Henriksen identified five factors that impede effective communication. First, interruptions can disrupt work flow and cause a negative impact on the safe, effective completion of tasks. Second, physicians and nurses are educated in separate silos. This can hinder effectiveness of communication between the two disciplines because of differences in the "implicit assumptions" of the two professions. Third, authority gradients may exist in which health care providers are afraid to "speak up." This is particularly evident in a hierarchical structure that impedes both upward communication and dissemination of critical information that could prevent an error from occurring. Fourth, given the complexity of today's health environment, it is not always clear who is responsible for what. This adds to the confusion and places patients at risk for needs not being addressed in a timely manner. Fifth, the multiple transitions which occur across the health care continuum are a high-profile factor increasing the risk of miscommunication (Dayton & Henriksen, 2006).

Finally, it is important for health care organizations to assess possible setups for poor communication and be diligent about offering programs and outlets to help foster collaboration. By addressing communication issues, health care organizations have an opportunity to greatly enhance their clinical outcomes and improve patient safety culture.

Nursing Work Environment

Healthcare delivery is a complex system, and patient safety must be improved on multiple levels. One critical area is the nursing care environment. The work environment of nurses should be made more efficient by reducing commission of errors and providing greater opportunity to detect and remedy errors when they occur. Although nurses do act as a last barrier to harm, much improvement in their work environment is needed in order to promote safety. The IOM has reported that the work environment for nurses needs to be substantially transformed to better protect patients from healthcare errors (National Academies News, 2003). The IOM documented the need for improvement of nurses' working environments in order to promote safe patient care (2000, 2004).

A number of studies provide evidence that nurses spend a significant portion of their time in activities that are inefficient and which decrease the amount of time they have available to monitor patient status, provide therapeutic patient care, and educate patients. In a survey of 50% of RNs living in Pennsylvania, 34.3% of hospital nurses reported performing housekeeping duties, 42.5% reported delivering and retrieving food trays and 45.7% reported that their duties included the transportation of patients. Of these same nurses, 27.9% and 12.7%, respectively, reported leaving patient/family education and patient/family preparation unfinished at the time of discharge (Aiken, et al., 2001).

An effective hospital nurse work environment is one in which nurse leadership provides the right structures, practices, and people. This enables clinical nurses to do the right things correctly, thus producing desired outcomes for patients, staff, and the organization. Researchers of magnet hospitals have identified the following factors in a positive nursing environment: leadership attributes of nursing administrators (e.g., vision and responsiveness), professional attributes of the staff nurses (e.g., nurse autonomy and control, ability to establish and maintain therapeutic nurse–patient relationships, and collaborative nurse–physician relationships), and an environment that supports professional practice (Scott, Sochalski & Aiken, 1999). Kazanjian, Green, Wong & Reid (2005) conducted a systematic review of studies linking nursing work environment characteristics to patient mortality and concluded that the evidence from 27 studies supported a link between inpatient mortality and variables such as autonomy, good nurse/physician relationships, reasonable workloads, care based on nursing standards, positive manager attributes, and professional development opportunities.

The IOM report, "*Keeping Patients Safe*" (2004), recommends these strategies to help with building an excellent and safe nursing work environment: directly involving workers throughout the design process; simplifying and standardizing common work procedures and equipment; avoiding reliance on individual worker memory; decreasing interruptions, distractions, and interferences; instilling redundancy and back-up systems; using constraint and forcing functions; and avoiding reliance on individual vigilance. Finally, improving the nursing environment requires a broad approach in order to benefit patient safety. By treating the work environment as a complex system, approaches can result in greater nurse professionalism and patient safety.

Organizational learning

Organizational learning is defined as the capacity within organizations to maintain or improve performance based on (their own or another's) experience. A learning organization is an organization "skilled at creating, acquiring, and transferring knowledge and at modifying its behavior to reflect new knowledge and insight" (Garvin, 1993, p. 80). A learning culture is demonstrated by the organization's willingness and ability to draw the correct conclusion from safety data and the responsibility to implement the needed strategies for reform. In health care, harmful adverse events do not need to be experienced to learn from them. By making an effort to learn from the mistakes of others, organizations have the opportunity to improve care without the human toll associated with actual events (Stevens, Matlow and Laxer, 2006).

Organizations learn by creating opportunities for information flow and knowledge creation using a wide range of learning mechanisms such as after action reviews, audits, problem investigations, performance appraisals, simulation, and benchmarking (Popper & Lipshitz, 1998). Hospital leadership must provide resources and time to improve safety and foster an organizational culture that encourages recognition and learning from errors. Evidence-based practices and continued safety research contribute to an environment that fosters learning. Learning is enhanced by an open interdisciplinary discussion of unfortunate events by all members of the medical team. The learning organization focuses on what can be learned from errors, not on where to find fault and place blame. Analysis focuses on systems rather than individuals and is non-punitive. Analysis should include trend and aggregate data (Spath, 2000).

Learning organizations do not passively wait for knowledge to present itself, but rather they actively manage the learning process by taking advantage of all sources of knowledge, using systematic experimentation to generate new knowledge internally and transferring

knowledge quickly and efficiently throughout the organization (Garvin, 1993). These processes are used to create better work tools, processes, systems, and structures in order to improve the organization's production processes (DeLong and Fahey, 2000). Continuous organizational learning has also been documented as playing a central role in the development and maintenance of safety in organizations (IOM, 2004). Learning systems are designed to foster continuous improvements in care delivery by identifying themes, reducing variation, facilitating the sharing of best practices, and stimulating system-wide improvements. Following careful expert analysis of underlying causes, recommendations are made for system redesign to improve performance and reduce errors and injuries (WHO, 2005).

Safety has been described as the final result of a process of organizational learning that involves all elements of an organization working collectively towards this end (Gherardi & Nicolini, 2000). All errors are considered learning opportunities in organizations with strong safety cultures. Any event related to safety, particularly due to human or organizational error, should be viewed as a valuable opportunity to improve the safety of operations through feedback (IOM, 2004).

The most important knowledge in the field of patient safety is how to prevent harm to patients during treatment and care. The fundamental role of patient safety reporting systems is to enhance patient safety by learning from failures of the health care system. Adverse events and errors reporting should be examined to learn from mistakes. The goal of a reporting system is to analyze the information gathered via errors reporting and identify ways to prevent future errors from occurring. The goal is not data collection. Through reporting systems we can learn for the benefit of future patients. Collecting reports and doing nothing with the information serves no useful purpose (IOM, 2000).

Errors Reporting

The Institute of Medicine report, “To Err is Human”, defined error as “Failure of a planned action to be completed as intended or use of a wrong plan to achieve an aim; the accumulation of errors resulting in accidents” (p. 210). Medical errors include medication errors, surgical errors, and diagnostic errors. Medication error will be used as an example for those errors.

Medication error. The literature shows that barriers to reporting medication administration errors include administrative response, disagreement over error, fear, and reporting effort. The underlying reasons for not reporting can be categorized into individual factors and organizational (or system) factors, which can be considered as origins of barriers to Medication Administration Errors (MAEs) reporting.

Individual factors. Fear is one of the foremost individual factors impeding voluntary reporting. Researchers conducted a descriptive correlational study using self-reported questionnaires to collect data from 402 healthcare professionals (Wolf, Serembus, Smetzer, Cohen & Cohen, 2000).They reported that fear of disciplinary action and punishment related to making medication errors was a greater concern for nurses compared to physicians and pharmacists. Based on these findings, the researchers proposed that a punitive environment could result in unreported medication errors. An additional study investigated nurses’ perceptions of medication errors and appropriate reporting (Osborne, Blais & Hayes, 1999). In this study, researchers administered self-report questionnaires (10 items) to medical-surgical staff nurses to survey causes of medication errors, perceptions of reporting medication errors (5 items), and responses to medication errors that should be reported (5 items). The results from 57 nurses (61.9% response rate) indicated that the perceived reasons for not reporting MAEs were personal

fear (86%) and the idea that the errors were not serious (57.9%). This study also showed that one-quarter of the 57 staff nurses had failed to report MAEs because of fear of repercussions. Another study found that nurses did not report MAEs because they were afraid of being blamed for MAEs (24%; n=597), coworkers' and managers' reactions, and the reporting process itself (Chiang & Pepper, 2006).

Organizational factors. Management reaction and reporting efforts are considered to be organizational or system factors for not reporting MAEs. Administrators' attitudes and responses to medication errors, such as focusing on learning rather than blaming, and providing incentives for reporting, can enhance nurses' reporting of MAEs candidly (Wakefield, Wakefield, Uden-Holman, Borders & Vaughn, 1999). In other words, nurses are willing to report MAEs when they believe administrative responses are supportive and encouraging. Two studies indicated that 63% and 84% of nurses did not report MAEs because of manager and peer responses (Antonow, Smith & Silver, 2000; Osborne, et al., 1999). While administrator and peer negative responses create barriers to MAE reporting, a cumbersome reporting effort is another reason for a lack of reporting. Reporting procedures and processes could determine the willingness of healthcare professionals to report medical errors (Lawton & Parker, 2002). The time involved in documenting incident reports and the extra work involved in reporting were reported as barriers to MAE reporting among nurses (Uribe, Schweikhart, Pathak, Dow & Marsh, 2002; Wakefield, et al., 1999).

Organizations should focus on breaking down these barriers in order to improve the reporting situation. For example, administrators should be educated to focus on the system as a potential cause of the error rather than focusing on the individual. Emphasis on medical error as a measure of quality of nursing care should be limited in order to encourage staff to report errors.

Policies and procedures should clearly define medication errors, and these manuals should be readily available to all staff. Errors cannot be eliminated completely; however, learning from past errors should be the strategy to prevent more dramatic errors from happening in the future. Specific strategies for encouraging staff to give voice to their errors include starting each unit meeting with the question, “What went wrong this month?” Each staff member is asked to recall one error and share it with the group. Another approach would be to bring up a list of errors and discuss how they occurred and how they might have been averted. Or one failure every month could be selected to complete a more in-depth root cause analysis and generate ideas for reducing the possibility of the failure recurring. This idea can be utilized in shift reports as well. During shift reports each day, five minutes could be utilized to debrief and discuss any situations that occurred that resulted in an error or could have resulted in an error (Kalisch & Aebersold, 2006).

This concept, if understood by mangers and staff, may limit staff fear of reporting errors. If reporting errors is time and effort consuming in an organization, relatively easy and less time consuming methods should be the target of the organizations' management. According to the Pennsylvania Patient Safety Collaborative (2009), some characteristics of an organization with a blame-free environment are:

- The organization embraces the concept that those under its employ or who practice in their facility do not purposely seek to create errors and that most errors occur as a result of ineffective, improperly designed, or flawed systems.
- The organization seeks to develop human resource and medical staff policies and procedures which support the realization that most errors are not the result of individual

failure, but system failure. The organization develops ways to reward rather than discourage reporting of errors or patient safety concerns.

- The organization celebrates success at improving the reporting of patient safety concerns and errors as well as how such disclosure has been used to make improvements in systems to prevent the future possibility of error.
- The organization purposely works to alter its mindset about errors and its behavior with respect to errors, possibly by changing the language it uses to address patient safety and errors.
- The organization seeks to engender an environment where the timely and open reporting of medical errors and patient safety is the norm through actively creating an environment where practitioners and employees do not fear retribution for raising concerns or reporting errors.
- The organization implements methods of feedback to learn from errors.

Teamwork

Teamwork in health care institutions refers to the process whereby small groups of individuals work together throughout the health care community, whether in intensive care units (ICU), operating rooms, labor and delivery wards, or family-medicine practices. Physicians, nurses, pharmacists, technicians, and other health care professionals must coordinate their activities if safe and efficient patient care is to be a priority (Xyrichis & Ream, 2008). Teamwork is endemic to a system in which all employees are working for the good of a goal, who have a common aim, and who work together to achieve that aim (Deming, 1986). Researchers and medical professionals agree that patient treatment and safety is most effectively improved

through interdisciplinary teamwork. Policymaker and professional bodies have also been promoting teamwork as the preferred model of practice (Leonard, Graham and Bonacum, 2004).

Teamwork is important to patient safety because healthcare is better when it is delivered by a team. Teams have greater knowledge and skills than a single person and allow us to catch errors before they occur, learn why errors happen so that we can do our jobs better, focus on our patients instead of on our tasks, and provide support for each other (Flin, Yule, McKenzie, Paterson-Brownand & Maran, 2006). When considering a teamwork model in health care, an interdisciplinary approach should be applied. Unlike a multidisciplinary approach, in which each team member is responsible only for the activities related to his or her own discipline and formulates separate goals for the patient, an interdisciplinary approach is a joint effort on behalf of the patient with a common goal from all disciplines involved in the care plan (Nelson, King & Brodine, 2008).

The lack of adequate teamwork among the staff is another dimension leading to problems with patient safety. Teams make fewer mistakes than do individuals, and this is especially true when every member of a team is as aware of their teammates' responsibilities as they are their own (IOM, 2004). Fewer medical errors occur when teamwork is strong because processes are planned and standardized. Each member knows his own responsibilities as well as those of his teammates, members look out for each other and notice errors before they happen, and members trust one another's judgments and attend to one another's safety concerns (IOM, 2000). When teamwork is strong on a patient unit, one team member may detect an error of another team member before an adverse event occurs. They are aware of the strengths and vulnerabilities of one another and are cognizant of the activities of the other team members. However, if teamwork is poor, nurses work in psychological isolation or with other team members who do not

recognize their vulnerabilities and need for assistance or feel no responsibility for the work of their teammates (Kalisch & Aebersold, 2006). Greater teamwork is essential if patient safety is to be achieved. Hospitals need to invest in teamwork training and follow-up coaching with a special emphasis on conflict management and giving feedback.

The IOM report recommends, among other things, that health care organizations implement patient safety programs that "promote team functioning" and that "train in teams those who are expected to work in teams" (IOM, 1999). Other evidence of the growing support for greater interdisciplinary teamwork is the Joint Commission on Accreditation of Healthcare Organizations requirement of evidence of interdisciplinary collaboration and the report by the President's Advisory Committee on Consumer Protection and Quality in the Health Care Industry, which explicitly states that "the training of physicians, nurses, and other health care workers should provide those individuals with greater experience in working in interdisciplinary teams" (Drinka & Clark, 2000).

Nursing Staffing

Nursing staffing is defined as “the provision of the appropriate amount and type of care by persons possessing the requisite skills to the largest number of patients possible in the most cost efficient and humanly effective manner consistent with desired patient outcomes and personnel needs for satisfaction” (Hall, 2005, p. 11). Nursing staffing has also been described as the process of determining the appropriate number and mix of nursing resources to meet the workload demand for nursing care on the patient care unit (Jelinek & Kavois, 1992). The connection between nursing work and patient safety is affirmed by research linking nurse staffing levels to patient outcomes.

Rogers, Hwang, Scott, Aiken, & Dinges (2004) found critical care nurses who worked more than 12.5 consecutive hours demonstrated a three-fold increased risk in medical error (mostly medication related). Within the same cohort, 65% reported difficulty keeping awake and 20% said they fell asleep at least once during the 28 day study. Aiken, et al., (2002) concluded that registered nurse staffing levels may be associated with mortality. In 168 hospitals with a mean nurse to patient ratio between 4:1 and 8:1, each additional surgical patient per nurse was associated with a 7% higher likelihood of the patient dying within 30 days of hospital admission and a 7% higher likelihood of failure to rescue.

Sochalski (2004) analyzed data from a 1999 statewide survey of 8,670 inpatient staff nurses working in acute care hospitals. Quality of nursing care ratings were significantly associated with the number of patients nurses cared for, rates of unfinished care for those patients, and the frequency of patient safety problems. Unfinished care had the strongest relationship of all, with over 40% of the variation in quality ratings associated with the number of tasks undone. When patients received a higher overall number of nursing hours, and when a higher proportion of that care was provided by RNs, the length of time patients spent in the hospital was shortened. They had fewer complications, such as urinary tract infections and upper gastrointestinal bleeding (Needleman, Buerhaus, Mattke, Stewart & Zelevinsky, 2002). A higher proportion of hours of care provided by RNs in the staff mix were associated with a lower 30-day mortality rate for selected medical and surgical hospitalized patients (Tourangeau, Giovannetti, Tu & Wood, 2002). A 10% increase in the proportion of nurses holding a bachelor's degree was associated with a 5% decrease in both the likelihood of surgical patients dying within 30 days of admission and the odds of failure to rescue (Aiken, Clarke, Cheung, Sloane & Silber, 2003). An increase of one hour worked by RNs per patient day was associated with an 8.9%

decrease in the odds of the patient contracting pneumonia (Cho, Ketefian, Barkauskas & Smith, 2003). More RN direct care time per resident per day was associated with fewer pressure ulcers, hospitalizations, and urinary tract infections (UTIs); less weight loss, catheterization, and deterioration in the ability to perform activities of daily living (ADLs); and greater use of oral standard medical nutritional supplements (Horn, Buerhaus, Bergstrom & Smout, 2005). Based on those studies, it can be concluded that improving nurses' working conditions will improve patient safety.

The evidence is strong that adequate staffing is necessary for patient safety. When healthcare leaders become more aware of the impact of understaffing on working conditions and on staff performance, they will be able to design a safer system of patient care.

Hospital handoffs

The hand-off or transfer of patients from nurse to nurse, shift to shift, unit to unit, and from one health care organization to another health care organization has also been identified as a potential dimension of patent safety within nursing practice (Cook, Render, & Woods, 2000). The Institute of Medicine (2001) reported that "it is in inadequate handoffs that safety often fails first" (p. 45). There are a number of terms used to describe the handoff process, such as handover sign-out, sign over, cross-coverage, and shift report. Researchers have identified the hand-off as an important and vulnerable point in the patient care process that may affect subsequent clinical decision-making and quality of care (Borowitz, Waggoner-Fountain, Bass and Sledd, 2008; Stevens, 2008; Sanfey, Stiles, Hedrick and Sawyer, 2008; Patterson, 2008).

Ineffective handovers can lead to wrong treatment, delay in diagnoses, severe adverse events, patient complaints, increased healthcare costs, and length of stay (Australian Council for Safety and Quality in Health Care, 2005). The definition of hospital handoff is provided by the

Australian Medical Association and is defined as the transfer of professional responsibility and accountability for some or all aspects of care for a patient or group of patients to another person or professional group on a temporary or permanent basis. The primary objective of a “hand-off” is to provide accurate information about a patient’s care, treatment, and services as well as current condition and any recent or anticipated changes.

By improving the accuracy, structure, and communication processes of handoffs, continuity and quality of patient care will be dramatically enhanced. Patient transfers from one caregiver to another are an area of high safety consequence, as is evident by the Joint Commission on Accreditation of Healthcare Organization's Patient Safety Goals. Joint Commission National Patient Safety Goal-2E states: implement a standardized approach to “hand-off” communications, including an opportunity to ask and respond to questions (JCAHO, 2008). Patterson and colleagues (2004) provided recommendations to improve hand-off procedures such as the use of structured tools that can facilitate consistency in communication exchanges. Examples include, but are not limited to, the “I PASS THE BATON,” ”I-SBAR,” “PACE,” or the “Five-Ps.” Each mnemonic is developed to guide medical hand offs and optimize information transfer through the use of a system, checklist, template, or mnemonic that includes updated information, recent changes in condition or circumstances, and any anticipated changes or aspects of care that need to be observed or watched. Finally, by improving the accuracy, structure, and communication processes of handoffs, continuity and quality of patient care will be dramatically enhanced.

The Joint Commission International Center for Patient Safety (2005) provided strategies to improve hospital handoffs, recommending the use of clear language and the avoidance of the use of abbreviations or other terms which can be misinterpreted. Furthermore, this study

provided suggestions for the use of effective communication techniques, recommended the standardization of reporting from shift to shift and unit to unit to assure smooth handoffs between settings, and emphasized the use of appropriate technology in order to enhance communication. Ineffective handoffs can lead to a host of patient safety problems. Additional research and development of strategies designed to reduce these problems are required (Bomba & Prakash, 2005).

CHAPTER 3

METHODOLOGY

The purpose of this research is to identify the systems factors that Registered Nurses perceive as contributing to a culture of patient safety and that affect participation and engagement in the patient safety culture change at King Fahad Medical City (KFMC) in Riyadh, Saudi Arabia. This chapter addresses the research design, setting of the research population and sample to be studied, the research instrument, the data collection process, the plan for protecting the human rights of the participants, and the data management and analysis.

Design

This study employs a cross-sectional descriptive/correlational design to examine nurses' perceptions of the existing culture of patient safety at KFMC. Cross-sectional design was used due to a lack of prime results regarding patient's safety culture in Saudi hospitals, and the result of this proposed research will provide a baseline for patient safety practices in Saudi hospitals. This research design is cross-sectional because the data are collected from participants at a single point in time or during a single, relatively brief time period, and comparisons are made across the variables of interest.

Population and Sample

The study population of this research was registered nurses who are currently licensed at KFMC. A convenience sampling methodology was used to recruit registered nurses working in KFMC. Attempts to reduce the limitation of the sampling method and to increase appropriate representation was made to ensure the inclusion of a wide range of registered nurses across the hospitals. For example, the surveys were distributed to all of the patient care units across the hospitals and to different shifts.

An effort was made to collect data from at least 300 registered nurses. This sample size is based on a 0.05 margin of error and a 95% confidence interval. The target population for the analysis was more than 1,000 staff nurses working in inpatient units.

Inclusion Criteria

Registered Nurses (RN) must meet the following criteria for inclusion in this study:

- The RN should be working on an inpatient unit, not on an outpatient unit, as the AHRQ patient safety measures focus on and are more appropriate for acute settings than primary care settings.
- The RN must have occupied the position for at least six months, as he/she needs to be familiar with the KFMC system.
- The research was conducted in English, so participants must be able to understand, speak and write English. English is the official language of KFMC.

Setting

The sample for the research was recruited from KFMC. KFMC is a tertiary care center which supports health services research. It consists of a general hospital, maternity hospital, pediatric hospital, rehabilitation center, and primary care clinics with a total of 1,160 beds. In addition to the hospitals, there are a burn unit, kidney center, intensive care facilities, and spinal cord injury treatment unit. This facility was selected because it has an affiliation with and support from the Ministry of Health, thereby having the potential to impact healthcare in Saudi Arabia.

Procedure of Data Collection

Participants were recruited from KFMC through the nursing department. The first phase was meeting with the nursing department director to describe the purpose and aims of the

research. A memorandum was sent from the nursing department director to RNs. The purpose of this memorandum was twofold - to explain the purpose of this study and confirm management approval to conduct this study. A packet containing a description of the research and instructions were attached to each survey. The investigator went to each nursing unit at different time intervals that were mutually convenient for the staff. Locked drop boxes were placed at each unit in order to protect the individual identity of each participant.

Measurements

The Hospital Survey on Patient Safety Culture (HSOPSC) instrument was used to measure perceptions of nurses on patient safety culture.

Hospital Survey on Patient Safety Culture

HSOPSC is a self-administered tool developed by the Agency for Healthcare Research and Quality (AHRQ). HSOPSC is designed to assess the patient safety culture of a healthcare organization as a whole or to assess units within the hospital. HSOPSC consists of 42 questions and measures 14 dimensions. It was developed by Westat under contract with AHRQ. The survey was developed after conducting an extensive review of the literature pertaining to safety, accidents, medical errors and reporting, safety climate and culture, and organizational climate and culture. The survey is also derived from other instruments, including the Veterans Health Administration Patient Safety Questionnaire and the Medical Event Reporting System for Transfusion Medicine, a safety culture instrument developed for use intransfusion medicine. HSOPSC was pilot tested on 1,437 hospital employees from 21 hospitals in the United States. HSOPSC has been administered in 24 countries including Serbia, Saudi Arabia, Korea, Brazil, and Spain (Battles, Sorra & Nieva, 2008).

An exploratory factor analysis was conducted to explore the dimensionality of survey data. Principle components analysis and varimax rotation were used to maximize the independence of factors. The analysis revealed 14 factors with 18 values greater than or equal to 1.0. The total variance explained by the 14 factors was 64.5%, with most of the factors loading on 1 factor (Sorra & Nieva, 2004). The draft pilot survey contained items on a five-point Likert response scale and included two single-item measures of outcomes and 12 patient safety dimensions. Confirmatory factor analysis was then conducted to determine how well the posited factor structure conformed to the data. After analysis of several confirmatory factors, a final confirmatory factor analysis model was determined by the researchers, which provided a good fit with the data.

Reliability

Reliability means that the instrument is measuring what it is intended to measure. An instrument is reliable to the extent that it provides consistent measures across subjects and is stable over time (Streiner & Norman, 2003). In addition, reliability is often expressed as a coefficient of correlation. An instrument with perfect reliability has a coefficient of 1.00. A coefficient of at least 0.90 is recommended for achievement and aptitude tests, whereas a coefficient of at least 0.80 is acceptable for personality measures.

Internal consistency reliabilities were examined for the final 12 dimensions of patient safety culture identified in the confirmatory factor analysis. The survey included both positive and negatively worded items so the negative items were reverse coded. Each of the 12 patient safety dimensions was found to have acceptable reliability with Cronbach alpha greater than or equal to 0.60 (Sorra & Nieva, 2004). Reliability coefficients ranged from 0.63 to 0.84. The safety culture dimensions included in the final survey are shown below, with reliabilities in

parentheses. The two outcome dimensions (multiple-item scales) were: (1) overall perceptions of safety (0.74) and (2) frequency of event reporting (0.84). The 10 safety culture dimensions (multiple-item scales) were: (1) Supervisor/manager expectations and actions promoting patient safety (0.75), (2) Organizational learning—Continuous improvement (0.76), (3) Teamwork within units (0.83), (4) Communication openness (0.72), (5) Feedback and communication about error (0.78), (6) Non-punitive response to error (0.79), (7) Staffing (0.63), (8) Hospital management support for patient safety (0.83), (9) Teamwork across hospital units (0.80), and (10) Hospital handoffs and transitions (0.80) (Sorra & Nieva, 2004).

Construct Validity.

Validity is the extent to which an instrument reflects the concept being examined. There are three ways in which validity can be measured. In order to have confidence that an instrument is valid, all three kinds of validity evidence should be considered. Content validity is a systematic assessment of the content of an instrument to ensure that it adequately represents or includes the entire content area, or domain, specified. Construct validity is an estimate of how well a particular instrument measures a theoretical construct. Concurrent validity indicates an individual's current standing on a criterion measure related to the construct of interest (Kerlinger & Lee, 2000).

Validity analysis was conducted by creating composite scores for the 12 patient safety dimensions, by obtaining the mean of the responses to items in each dimension and then correlating them with one another (Sorra & Neiva, 2004). Construct validity was determined by looking at the correlations of the 12 dimensions. Correlations ranged between 0.23 and 0.60 and indicated that no two patient safety dimensions measured the same construct. A one-way analysis of variance (ANOVA) was conducted on each of the 12 patient safety dimensions and the two

outcome measures in order to establish the extent to which the composite scores differentiated among hospitals. All ANOVAs found response variability with statistical significance on the patient safety dimensions between hospitals and within hospitals (Sorra & Nieva, 2004). There were a total of 42 items for the HSOPSC instrument. The tool measures seven unit-level aspects of safety culture: (1) Supervisor/manager expectations and actions promoting safety (4 items); (2) Organizational learning - Continuous improvement (3 items); (3) Teamwork within units (4 items); (4) Communication openness (3 items); (5) Feedback and communication about error (3 items); (6) Non-punitive response to error (3 items); and (7) Staffing (4 items). In addition, the survey measured three hospital-level aspects of safety culture: (1) Hospital management support for patient safety (3 items); (2) Teamwork across hospital units (4 items); and (3) Hospital handoffs and transitions (4 items). Finally, four outcome variables were included: (1) Overall Perceptions of safety (4 items); (2) Frequency of event reporting (3 items); (3) Patient safety grade of the hospital unit (1 item); and (4) Number of events reported (1 item) (Sorra & Nieva, 2004).

Data Management and Analysis

Microsoft Excel was utilized for data entry. Error checking routines were created as part of the database application. Data was double-entered and cross-checked. Data files were backed up and password protected. The Statistical Program for Social Sciences (SPSS, Version 17) was used for data analysis. Data analysis began with preparatory activities such as the treatment of missing data, identification of outliers, and other data cleaning tasks. The distributions of all obtained measures were plotted graphically for visual inspection regarding deviation from normality, and appropriate quantitative tests were utilized to evaluate possible deviations. A detailed descriptive analysis of all quantitative data was performed, involving the summarization

of data and the use of inferential and graphical exploratory data analytic techniques. The information obtained from this preliminary investigation was used to: (1) describe univariate and bivariate sample distributions of the data, (2) identify the interrelationships between variables and (3) check for the violation of assumptions underlying identified statistical techniques. Preliminary analysis examined (1) population representation of the sample because of exclusions or dropouts, (2) patterns of missing data and (3) the internal consistency and validity of established scales. The randomness of missing data between subjects and within a given subject was investigated using available information on subject characteristics to help discern patterns in the missing data and to identify missing data mechanisms. The internal consistency of scales was estimated using Cronbach's coefficient alpha or, if items were binary, Kuder-Richardson formula 20.

Statistical Analysis

Research Question #1: What are nurses' perceptions of patient safety culture?

Research Question #2: How do nurses perceive the assessment of the frequency of medical error reporting?

To address Questions #1 & 2, descriptive statistics were used to describe the nurses' perceptions of patient safety culture and nurses' perceptions of the assessment of the frequency of medical error reporting. The descriptive statistics included measures of central tendency (mean, median, and mode) and dispersion (range, variance, and standard deviation) for continuous variables and frequency distributions for the categorical variables.

Research Question #3: What is the relationship among selected demographic variables and nurses' perceptions of patient safety culture?

Analysis of frequency (chi-square test) was used to determine the relationship between the categorical variables. If the parametric assumptions were met, Pearson correlation coefficient was utilized to determine the relationship between variables measured on ratio or interval scales; otherwise, the Spearman correlation coefficient was used.

Research Question #4: What are the relationships among safety culture dimensions?

The safety culture dimensions at unit and hospital levels and outcome dimensions are shown in Table 3. To address Research Question 4, analysis of frequency (chi-square test) was used to determine the relationship between the categorical variables. If the parametric assumptions were met, Pearson correlation coefficient was utilized to determine the relationship between variables measured on ratio or interval scales; otherwise, the Spearman correlation coefficient was used.

Research Questions #5: To what extent do safety culture dimensions (unit level and hospital level) predict nurses' perceptions of patient safety culture outcome dimensions?

To address Research Question 5, four multiple regression equations were utilized to evaluate the potential impact outcome dimension variables on the culture safety variables listed for the unit and hospital levels (Table 3). Crude (unadjusted) regression coefficients were estimated as well as adjusted regression coefficients based on multivariate modeling of multiple factors. Residual analysis was conducted to identify sources of model misspecification, outliers, and possible influential observations. Sensitivity analyses were performed to discern the impact of influential cases on the results. Higher order effects for the continuous factors and interaction effects among factors were considered. In predicting the outcome dimensions, step-type regression analysis was used to obtain the optimal models. In addition, to determine the strength of the overall relationships between safety culture and outcome dimensions, canonical

correlation analysis was used. Canonical correlation analysis is a multivariate statistical model that facilitates the study of interrelationships among sets of multiple dependent variables and multiple independent variables. Whereas a multiple regression predicts a single dependent variable from a set of multiple independent variables, a canonical correlation predicts multiple dependent variables from multiple independent variables. In particular, canonical redundancy analysis was performed and a redundancy index was computed. Canonical redundancy analysis indicates the proportion of variance in outcome variables explained by a linear composite of the safety culture variables. The redundancy index is the equivalent of computing the squared multiple correlation coefficient between the total independent set and each variable in the dependent set, and then averaging these squared coefficients to arrive at an average explained variation for the set of dependent variables (Hair, Anderson, Tatham & Black, 1998).

Table 3

Safety Culture Dimensions at Unit and Hospital Levels

Safety Culture Dimensions (Unit Level)	**Safety Culture Dimensions (Hospital Level)**	**Outcome Dimensions**
1. Supervisor/Manager Expectations & Actions Promoting Safety	8. Hospital Management Support For Patient Safety	11. Frequency of Event Reporting
2. Organizational Learning-Continuous Improvement	9. Teamwork Across Hospital Units	12. Overall Perceptions of Safety
3. Teamwork Within Units	10. Hospital Handoffs and Transitions	13. Patient Safety Grade (of The Hospital Unit)
4. Feedback and Communication about Error		14. Number of Events Reported
5. Nonpunitive Response to Error		
6. Staffing		
7. Communication Openness		

Ethical Consideration

Approval was obtained from the Institutional Review Boards of Wayne State University and King Fahad Medical City prior to beginning the study. Participation in the study was voluntary, and the participants were anonymous. The survey cover letter outlined the purpose and importance of the survey and stated that the data will be reported only as an aggregate. The cover letter explained that once the survey was returned, it would not be possible for the participant to withdraw because there was no way to identify which survey the participant had completed. Participants were instructed not to place personal identifiers on the survey itself. Instructions on how to complete the survey were included at the top of the survey. Details of the individual responses were not able to be used to identify individual participants. Any publication of reports or articles will not include any information containing personal identifiers.

The participants were not in any danger of physical/psychological risk or physical discomfort. They had the opportunity to contact the researcher for further information related to the results of the research. Completion and return of the survey was indicated as consent to participate in this research study. This was communicated to the participants in the cover letter.

CHAPTER 4

RESULTS

The purpose of this research is to identify the systems factors that RNs perceive as contributing to a culture of patient safety and to study the effects these perceptions have on nurses' participation and engagement in the patient safety culture at King Fahad Medical City, Saudi Arabia. The purpose of this chapter is to describe the research participants, response rate, instrument reliability, and the results of data analysis, organized according to the research questions.

Description of the Sample

The sample of this study was registered nurses at KFMC, Saudi Arabia. Copies of the surveys were distributed to a total of 600 RNs. A total of 500 questionnaires were returned. Among these returned questionnaires, 55 were excluded because they had missing responses on more than one complete section of the questionnaire. The total response rate for this study was 83%.

Reliability Testing for the Hospital Survey on Patient Safety Culture (HSOPSC)

Table 4 summarizes the results of Cronbach's alpha for Hospital Survey on Patient Safety Culture (HSOPSC). The Cronbach's alpha for the total scale (44 items) was 0.88.

Demographics Data

The results of demographic data analysis were obtained from 445 subjects, as shown in Table 5. The majority of nurses were female (87.4%, n=389). The age of respondents ranged from the 20's to the 50's; the most common age range was 31 to 40 years (40.9%, n=182) while 20 to 30 was 31.7% (n=141). Only 17.1% (n=76) were 41 to 50 and 10.3% (n=46) were 55 to 60. Regarding the education level of the participants, there was a large number of baccalaureate

degree nurses (85.4%, n= 380). Less than 8.5% (n=38) of nurses had an associate degree and 3.1% (n=14) had a masters degree. There was one respondent who had a Doctorate (0.2%). With regard to the length of time nurses worked in the nursing profession, 31.2% (n=139) worked six to ten years, 24% (n=107) worked eleven to fifteen years, 19.1% (n= 85) worked between one to five years, 11.5% (n= 51) worked between sixteen to twenty years, and 13.9% (n=62) worked more than 21 years. The staff positions of the participants included staff nurses (83.8%, n=373), charge nurses (9.9 %, n= 44), head nurses (2.2 %, n=10), educators (2.9%, n=13), and three participants (0.7%) did not specify their position. The respondents came from nine units located at four hospitals within King Fahad Medical City.

The nurses' main areas of work included medical/surgical (10.6%, n=47), maternity (19.3%, n=86), pediatric (13%, n=58), rehabilitation (12.8%, n=57), critical care (13.9%, n=62), cardiac (10.1%, n=45) and oncology (6.3%, n=28). Responses by which hospital nurses were currently assigned to work were as follows: main hospital (46.1%, n=205), women's hospital (22.5%, n=100), children's hospital (17.5%, n=78), and rehabilitation hospital (13.7%, n=61).The length of time nurses worked at the current hospital ranged from less than one year to more than five years. More than half of the nurses (53.9%, n=240) had worked from two years to five years, 24.5% (n=109) worked one to two years, and 20% (n=89) worked more than five years. Regarding the language spoken, 87% (n=387) of the nurse respondents were non-Arabic speaking, while 13% (n=58) were Arabic speaking. In relation to the shifts nurses usually worked, almost half the respondents worked day shift (47%, n=209), 44% (n=196) worked both day and night shifts, and 8.3% (n=37) reported working night shift.

Table 4

Reliabilities for Hospital Survey on Patient Safety Culture (HSOPSC)

Patient safety culture dimensions	**Number of items**	**Cronbach's Alpha**
Supervisor/manager expectations & actions promoting patient safety	4	0.61
Organizational learning-continuous improvement	3	0.64
Teamwork within units	4	0.72
Feedback and communication about error	3	0.76
Non-punitive response to error	3	0.61
Staffing	4	0.34
Communication openness	3	0.53
Hospital management support for patient safety	3	0.59
Teamwork across hospital units	4	0.62
Hospital handoffs and transitions	4	0.70
Frequency of events reported	3	0.87
Overall perceptions of safety	4	0.15
HSOPSC total scale	**42**	**0.88**

Table 5

Frequencies and Percentages of Demographics Variables

Demographic variables			Frequency	Percent
Gender	Male		55	12.4
	Female		389	87.4
		Total	**444**	**99.8**
Age	20-30 years		141	31.7
	31-40 years		182	40.9
	41-50 years		76	17.1
	51-60 years		46	10.3
		Total	**445**	**100**
Level of education	Associates degree		38	8.5
	Baccalaureate degree		380	85.4
	Master degree		14	3.1
	Doctoral degree		1	0.2
		Total	**433**	**97.3**
Years in nursing profession	1-5 years		85	19.1
	6-10 years		139	31.2
	11-15 years		107	24
	16- 20 years		51	11.5
	21 years or more		62	13.9
		Total	**444**	**99.8**
Hospital currently assigned to work	Main hospital		205	46.1
	Women hospital		100	22.5
	Children hospital		78	17.5
	Rehabilitation hospital		61	13.7
		Total	**444**	**99.8**
Nursing unit currently assigned to work	Medical /Surgical		47	10.6
	Maternity		86	19.3
	Pediatric		58	13
	Rehabilitation		57	12.8
	Critical Care		62	13.9
	Cardiac		45	10.1
	Oncology		28	6.3
	Neurosciences		18	4
	Renal dialysis unit		8	1.8
	Other		34	7.6
		Total	**443**	**99.6**
Position	Staff Nurse		373	83.8
	Charge Nurse		44	9.9
	Head Nurse		10	2.2
	Educator		13	2.9
	Other		3	0.7
		Total	**443**	**99.6**

Table 5. continued

Demographic variables			Frequency	Percent
Arabic speaking	Yes		58	13
	No		387	87
		Total	**445**	**100**
Shift you usually work	Day		209	47
	Night		37	8.3
	Day/Night		196	44
		Total	**442**	**99.3**
Length of time working at current hospital	Less than one year		7	1.6
	More than one year to two years		109	24.5
	More than two year to five years		240	53.9
	More than five years		89	20
		Total	**445**	**100**

Results of Research Questions

This section presents the results of the data analysis in relation to the research questions noted in the previous chapter. A variety of statistical techniques were applied to compute the findings from the survey data. Details are provided in a question-by-question format below.

Research Question #1: What are nurses' perceptions of patient safety culture?

To answer research question #1 "What are nurses' perceptions of patient safety culture?", descriptive statistics were used to describe the nurses' perceptions of patient safety. The descriptive statistics included computing frequency and percentage of positive, neutral and negative responses for each of the 42 survey items. In order to report the overall percentage of positive responses for each of the 12 dimensions, the item level percentage of positive responses was calculated by first dividing the number of positive responses by the total number of positive, neutral, and negative responses to those items for each item in a dimension. The composite score

on each dimension is the overall average percentage of positive responses to each item in that dimension (see Table 6).

For positively worded items, the percent of positive responses is the combined percentage of respondents within a hospital who answered “Strongly agree” or “Agree,” or “Always” or “Most of the time,” depending on the response categories used for the item. For negatively worded items, the percent of positive responses is the combined percentage of respondents within a hospital who answered “Strongly disagree” or “Disagree,” or “Never” or “Rarely,” since a negative answer on a negatively worded item indicates a positive response (Soora & Nieva, 2004).

The percentages of the positive responses for each of the 12 patient safety culture dimensions were as follow: (1) Supervisor/manager expectations and actions promoting safety = 49%, (2) Organizational learning - Continuous improvement = 82%, (3) Teamwork within units = 70%, (4) Feedback and communication about error = 67%, (5) Non-punitive response to error = 49%, (6) Staffing = 54%,(7) Communication openness = 36%, (8) Hospital management support for patient safety = 90%, (9) Teamwork across hospital = 55%, (10) Hospital handoffs and transitions = 22%, (11) Frequency of event reporting = 61%, and (12) Overall perceptions of safety = 52%.

Based on the positive responses for each of the 12 patient safety culture dimensions, it can be indicted that two areas were identified as areas of strength, Hospital management support for patient safety and Organizational learning-Continuous improvement. The remaining dimensions were considered for potential improvement (see Table 6).

Positive Response Rate Comparison between KFMC and US Hospitals

AHRQ has established the Hospital Survey on Patient Safety Culture Comparative Database as a central repository for survey data from hospitals that have administered the AHRQ patient safety culture survey instrument. The database serves as an important resource for hospitals wishing to compare their patient safety culture survey results to those of other hospitals in support of patient safety culture improvement (AHRQ, 2009).

Table 7 summarizes dimension positive response rates with comparison to normative data from US hospitals that measured patient safety culture using the HSOPSC (AHRQ, 2009). For purposes of comparison, Table 7 contains the average positive response rates for each of the 12 dimensions measured at KFMC and at US hospitals.

Table 6

Average Percentages of Positive Responses on the Patient Safety Culture Dimensions

Patient safety culture dimensions	**Number of items**	**Average % of positive responses**
Supervisor/manager expectations & actions promoting patient safety	4	49%
Organizational learning-continuous improvement	3	82%
Teamwork within units	4	70 %
Feedback & communication about error	3	67%
Nonpunitive response to error	3	49%
Staffing	4	54%
Communication openness	3	36%
Hospital management support for patient safety	3	90%
Teamwork across hospital units	4	55%
Hospital handoffs & transitions	4	22%
Frequency of events reported	3	61%
Overall perceptions of safety	4	52%

Table 7

Comparison of Positive Response rate For Each Dimension at KFMC to Average in US Hospitals

	Average % of positive responses	
Patient safety culture dimensions	**US hospitals**	**KFMC**
Supervisor/manager expectations & actions promoting patient safety	75%	49%
Organizational learning-continuous improvement	71%	82%
Teamwork within units	79%	70 %
Feedback & communication about error	63%	67%
Nonpunitive response to error	44%	49%
Staffing	55%	54%
Communication openness	62%	36%
Hospital management support for patient safety	70%	90%
Teamwork across hospital units	57%	55%
Hospital handoffs & transitions	44%	22%
Frequency of events reported	60%	61%
Overall perceptions of safety	64%	52%

Research Question #2: How do nurses' perceive the assessment of the frequency of medical error reporting?

To answer research question #2: How do nurses' perceive the assessment of the frequency of medical error reporting?, descriptive statistics were used to describe the nurses' perceptions of the assessment of the frequency of medical error reporting. There were seven questions on the survey to address this research question. The descriptive statistics included computing frequency, percentage of nurses' responses, and neutral and negative responses for each of the 7 survey items.

Question D1: When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? There were 437 responses which break down as follows: 58.6% (n=256) responded "most of the time/always", a positive response; 21.6% (n=96) responded "sometimes", a neutral response; and 19.4% (n=85) responded "rarely/never", a negative response.

Question D2: When a mistake is made, but has no potential to harm the patient, how often is this reported? There were 437 responses which break down as follows: 55.3% (n=246) responded "most of the time/always", a positive response; 24.3% (n=108) responded "sometimes", a neutral response; and 18.6% (n=83) responded "rarely/never", a negative response.

Question D3: When a mistake is made that could harm the patient, but does not, how often is this reported? There were 437 responses which break down as follows: 68.1% (n=303) responded "most of the time/always", a positive response; 14.6% (n = 65) responded "sometimes", a neutral response; and 15.5% (n=69) responded "rarely/never", a negative response.

Question A8: Staff feel like their mistakes are held against them. There were 433 responses that break down as follows: 44.1% (n=196) responded “strongly agree/agree”, a negative response; 28.8% (n=128) responded “neither”, a neutral response; and 25.4% (n=109) responded “disagree/strongly disagree”, a positive response.

Question A12: When an event is reported, it feels like the person is being written up, not the problem. There were 436 responses that break down as follows: 44.5% (n=198) responded “strongly agree/agree”, a negative response; 27% (n=120) responded “neither”, a neutral response; and 26.5% (n=118) responded “disagree/strongly disagree”, a positive response.

Question Al6: Staff worry that mistakes they make are kept in their personnel file. There were 442 responses that break down as follows: 65.6% (n=292) responded “strongly agree/agree”, a negative response, 20.7% (n=92) responded “neither”, a neutral response and 13% (n=58) responded “disagree/strongly disagree”, a positive response.

Question G: In the past six months, how many event reports have you filled out and submitted? Total respondents were 434. There were 51% (n=248) that responded they did not fill out and submit any event reports, 28% (n=136) responded that they filled out and submitted 1 to 2 event reports, 10% (n=50) responded that they filled out and submitted 3 to 5 event reports, and 4% (n=19) responded that they filled out and submitted 6 event reports or more (Figure 3).

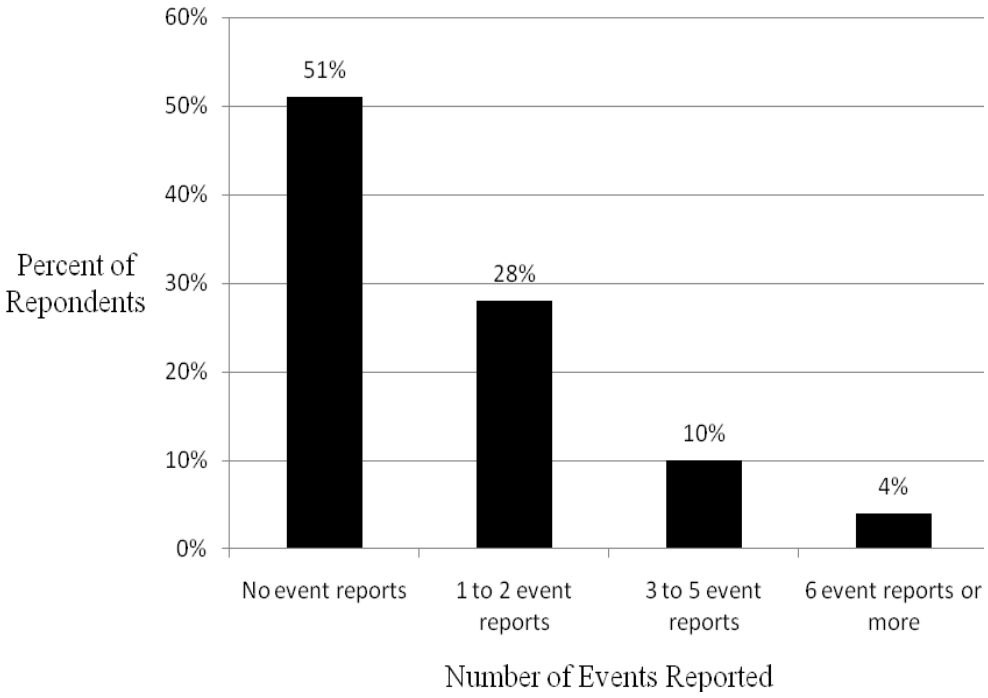

Figure 3. Event Report Distribution

Research Question #3: What is the relationship among selected demographic variables and nurses' perceptions of patient safety culture?

To answer this research question, analyses of frequency (chi-square test) were used to determine the relationship between the categorical variables. If the parametric assumptions are met, Pearson correlation coefficients were utilized to determine the relationship between variables measured on ratio or interval scales; otherwise, the Spearman correlation coefficients were used.

As indicated in Table 8, there were significant differences in supervisor/manager expectations, organizational learning, feedback and communication about error, non-punitive response to error, communication openness, management support for patient safety, teamwork across hospital units, and hospital handoffs and transitions, between male and female nurses.

As shown in Table 9, there were statistically significant correlations between nurse age and the following patient safety culture dimensions: supervisor/manager expectations, organizational learning, feedback and communication about error, hospital management support for patient safety, and hospital handoffs and transitions.

The results shown in Table 10 revealed that the level of education was not significantly correlated to any of the patient safety culture dimensions.

As indicated in Table 11, using Kruskal-Wallis test, there were statically significant differences in four patient safety culture dimensions and nurses with different years of experiences. The patient safety culture dimensions were: supervisor/manager expectations, organizational learning, teamwork within units, and feedback and communication about error.

Table 12 illustrates the relationship between the patient safety culture dimensions and Arabic and non-Arabic speaking nurses, using Man-Whitney test. In all patient safety culture

dimensions, there were statically significant differences in scores between Arabic and non-Arabic speaking nurses. The scores of the patient safety culture dimensions were higher for non-Arabic speaking nurses than Arabic speaking nurses.

Table 13 represents the relationship between the patient safety culture dimensions and the type of shift nurses usually work. Organizational learning (p=0.028), and hospital management support for patient safety (p=0.014) were statistically significant with the shifts nurses usually work.

Research Question # 4: What are the relationships among safety culture dimensions?

A correlation matrix among dimensions of patient safety culture was built to address Research Question #4. The Spearman correlation coefficient was used to determine the relationships among patient safety culture dimensions. The analysis revealed a significantly positive correlation among dimensions of patient safety culture. Staffing was the only dimension that was significantly negatively correlated with some of the patient safety culture dimensions (see Table 14).

Table 8

Summary Measures and Test of Significance of the Patient safety culture dimensions between Male and Female

Patient safety culture dimensions	Gender	N	Mean	Std. Deviation	z value	p-value
Supervisor/manager expectations	Male	53	13.60	2.429	-2.095	0.036
	Female	367	14.26	2.684		
Organizational learning	Male	54	10.94	2.004	-4.389	0.0001
	Female	379	12.09	1.612		
Teamwork within units	Male	53	15.42	2.568	-1.797	0.072
	Female	382	15.92	2.373		
Feedback & communication about error	Male	54	10.41	2.574	-3.460	0.001
	Female	376	11.66	2.224		
Nonpunitive response to error	Male	54	7.22	2.353	-2.130	0.033
	Female	369	7.95	2.234		
Staffing	Male	54	10.37	2.284	-.699	0.485
	Female	364	10.62	2.413		
Communication Openness	Male	54	9.20	2.565	-2.523	0.012
	Female	377	10.02	2.221		
Hospital management support	Male	55	10.45	2.115	-2.861	0.004
	Female	376	11.26	1.973		
Team work across hospital units	Male	54	12.78	2.312	-3.625	0.0001
	Female	375	14.11	2.658		
Hospital Handoffs	Male	52	12.65	2.757	-2.966	0.003
	Female	366	13.82	2.763		

Table 8 continued

Patient safety culture dimensions	Gender	N	Mean	Std. Deviation	z value	p-value
Frequency of Event reported	Male	53	10.58	2.885	-1.167	0.243
	Female	380	10.98	3.017		
Overall perceptions of safety	Male	53	13.00	2.295	-1.735	0.083
	Female	361	13.41	2.020		

Table 9

Summary Measures and Test of Significance of the Patient Safety Culture Dimensions among the Different Age Groups

Patient safety culture dimensions	Age group	N	Mean	std. deviation	F value	p-value
Supervisor/manager expectations	20-30	137	13.60	2.436	3.906	0.009
	31-40	173	14.31	2.417		
	41-50	72	14.79	2.838		
	51-60	39	14.54	3.626		
Organizational learning	20-30	139	11.55	1.823	4.522	0.004
	31-40	175	12.08	1.577		
	41-50	75	12.07	1.703		
	51-60	45	12.47	1.632		
Teamwork within units	20-30	139	15.43	2.447	2.457	0.062
	31-40	178	15.94	2.093		
	41-50	74	16.11	2.777		
	51-60	45	16.36	2.681		
Feedback & communication	20-30	135	10.99	2.369	3.562	0.014
	31-40	177	11.66	2.088		
	41-50	76	11.83	2.419		
	51-60	43	11.91	2.524		
Nonpunitive response to error	20-30	136	7.66	2.012	1.031	0.379
	31-40	170	7.89	2.193		
	41-50	75	7.87	2.575		
	51-60	43	8.35	2.627		
Staffing	20-30	137	10.40	2.194	2.422	0.065
	31-40	173	10.43	2.268		
	41-50	72	10.92	2.862		
	51-60	37	11.41	2.598		
Communication Openness	20-30	136	9.65	2.152	2.309	0.076
	31-40	176	9.91	2.334		
	41-50	76	9.93	2.294		
	51-60	44	10.68	2.310		
Hospital management support	20-30	136	10.76	1.860	3.304	0.020
	31-40	175	11.23	1.833		
	41-50	76	11.62	2.052		
	51-60	45	11.27	2.742		

Table 9 continued

Patient safety culture dimensions	Age group	N	Mean	std. deviation	F value	p-value
Team work across hospital units	20-30	136	13.60	2.504	1.467	0.223
	31-40	175	14.02	2.574		
	41-50	74	14.38	2.476		
	51-60	45	14.00	3.503		
Hospital Handoffs	20-30	130	13.15	2.807	2.676	0.047
	31-40	173	14.06	2.674		
	41-50	72	13.67	2.823		
	51-60	44	13.68	2.963		
Frequency of Event reported	20-30	136	10.61	2.979	0.787	0.501
	31-40	178	11.09	2.884		
	41-50	75	11.12	3.004		
	51-60	45	10.98	3.474		
Overall perceptions of safety	20-30	132	13.28	1.871	0.903	0.440
	31-40	168	13.26	1.952		
	41-50	75	13.71	2.167		
	51-60	40	13.35	2.760		

Table 10

Summary Measures and Test of Significance of the Patient Safety Culture Dimensions among Nurses with Different Education Background

Patient safety culture dimensions	Level of Education	N	Mean	std. deviation	Chi-Square	p-value
Supervisor/manager expectations	Associates	34	13.32	2.332	5.31	0.070
	Baccalaureate	363	14.21	2.551		
	Master	13	13.85	4.634		
Organizational learning	Associates	38	11.84	1.603	4.78	0.092
	Baccalaureate	369	11.96	1.691		
	Master	15	10.87	2.200		
Teamwork within units	Associates	37	15.62	2.165	1.65	0.439
	Baccalaureate	373	15.83	2.403		
	Master	15	16.00	2.878		
Feedback & communication	Associates	34	11.91	1.602	1.97	0.373
	Baccalaureate	372	11.46	2.322		
	Master	13	10.38	3.150		
Nonpunitive response to error	Associates	32	7.38	2.028	2.51	0.284
	Baccalaureate	366	7.85	2.180		
	Master	15	7.93	2.939		
Staffing	Associates	36	10.25	2.116	1.31	0.520
	Baccalaureate	357	10.60	2.386		
	Master	14	10.43	2.821		
Communication Openness	Associates	36	9.64	2.497	0.64	0.726
	Baccalaureate	369	9.91	2.241		
	Master	15	9.60	2.197		
Hospital management support	Associates	35	11.03	1.871	1.83	0.400
	Baccalaureate	371	11.15	1.978		
	Master	15	10.40	3.066		

Table 10 continued

Patient safety culture dimensions	Level of Education	N	Mean	std. deviation	Chi-Square	p-value
Team work across hospital units	Associates	36	13.89	2.713	2.71	0.258
	Baccalaureate	369	13.98	2.608		
	Master	13	12.54	3.503		
Hospital Handoffs	Associates	34	14.32	2.358	3.62	0.163
	Baccalaureate	361	13.66	2.721		
	Master	14	12.36	4.378		
Frequency of Event reported	Associates	36	11.42	3.426	3.11	0.211
	Baccalaureate	371	10.88	2.926		
	Master	15	10.20	3.877		
Overall perceptions of safety	Associates	34	13.29	1.784	2.405	0.301
	Baccalaureate	355	13.35	1.994		
	Master	15	12.53	2.949		

Table 11

Summary Measures and Test of Significance of the Patient Safety Culture Dimensions among nurses with different years of experiences

Patient safety culture dimensions	Years of experiences	N	Mean	std. deviation	Chi-Square	p-value
Supervisor/manager expectations	1 to 5	81	13.67	2.366	14.84	0.005
	6 to 10	135	13.84	2.453		
	11 to 15	101	14.69	2.675		
	16 to 20	49	14.65	2.562		
	21 years or more	55	14.42	3.337		
Organizational learning	1 to 5	83	11.70	1.737	13.31	0.010
	6 to 10	136	11.67	1.734		
	11 to 15	102	12.18	1.607		
	16 to 20	51	12.14	1.732		
	21 years or more	61	12.34	1.652		
Teamwork within units	1 to 5	84	15.40	2.504	15.43	0.004
	6 to 10	137	15.47	2.104		
	11 to 15	104	16.28	2.270		
	16 to 20	49	16.18	2.555		
	21 years or more	61	16.26	2.816		
Feedback & communication	1 to 5	82	11.15	2.389	13.72	0.008
	6 to 10	132	11.28	2.080		
	11 to 15	106	11.89	2.140		
	16 to 20	50	11.14	2.799		
	21 years or more	60	12.13	2.340		
Nonpunitive response to error	1 to 5	82	7.96	1.815	3.93	0.415
	6 to 10	131	7.66	2.063		
	11 to 15	102	7.71	2.516		
	16 to 20	48	7.88	2.256		
	21 years or more	60	8.35	2.680		
Staffing	1 to 5	85	10.36	1.975	1.87	0.759
	6 to 10	131	10.41	2.126		
	11 to 15	102	10.82	2.550		
	16 to 20	48	10.60	3.113		
	21 years or more	52	10.92	2.641		

Table 11 continued

Patient safety culture dimensions	Years of experiences	N	Mean	std. deviation	Chi-Square	p-value
Communication Openness	1 to 5	81	9.75	1.914	2.49	0.647
	6 to 10	135	9.76	2.251		
	11 to 15	104	9.95	2.479		
	16 to 20	51	9.90	2.394		
	21 years or more	60	10.37	2.329		
Hospital management support	1 to 5	83	10.86	1.719	8.38	0.078
	6 to 10	133	10.96	1.944		
	11 to 15	103	11.33	1.927		
	16 to 20	51	11.37	2.097		
	21 years or more	61	11.43	2.453		
Team work across hospital units	1 to 5	84	13.71	2.563	5.92	0.205
	6 to 10	132	13.69	2.345		
	11 to 15	103	14.17	2.804		
	16 to 20	50	14.38	2.364		
	21 years or more	60	14.08	3.310		
Hospital Handoffs	1 to 5	81	13.14	2.558	5.48	0.241
	6 to 10	126	13.58	2.908		
	11 to 15	104	14.21	2.665		
	16 to 20	49	13.53			
	21 years or more	58	13.72	3.013		
Frequency of Event reported	1 to 5	83	10.67	2.812	2.23	0.692
	6 to 10	134	10.95	2.946		
	11 to 15	106	11.01	2.952		
	16 to 20	50	11.28	3.104		
	21 years or more	60	10.97	3.257		
Overall perceptions of safety	1 to 5	81	13.22	1.732	1.39	0.845
	6 to 10	127	13.29	1.894		
	11 to 15	101	13.55	2.170		
	16 to 20	48	13.29	2.073		
	21 years or more	57	13.42	2.598		

Table 12

Summary Measures and Test of Significance of the Patient Safety Culture Dimensions between Arabic and Non Arabic Speaking Nurses.

Patient safety culture dimensions	Arabic	n	Mean	Std. Deviation	z value	p-value
Supervisor/manager expectations	Arabic	58	13.47	2.249	-2.53	0.011
	Non Arabic	363	14.29	2.701		
Organizational learning	Arabic	57	11.16	1.953		
	Non Arabic	377	12.07	1.637	-3.24	0.001
Teamwork within units	Arabic	58	14.91	2.379		
	Non Arabic	378	15.99	2.384	-3.30	0.001
Feedback & communication about error	Arabic	58	10.41	2.636		
	Non Arabic	373	11.67	2.203	-3.70	0.0001
Nonpunitive response to error	Arabic	57	7.46	1.843		
	Non Arabic	367	7.92	2.311	-1.18	0.238
Staffing	Arabic	57	10.65	2.482		
	Non Arabic	362	10.58	2.389	-0.75	0.452
Communication Openness	Arabic	58	9.38	2.270		
	Non Arabic	374	9.99	2.272	-2.27	0.023
Hospital management support	Arabic	58	10.40	2.110		
	Non Arabic	374	11.27	1.969	-3.07	0.002
Team work across hospital units	Arabic	56	12.86	2.438		
	Non Arabic	374	14.11	2.648	-3.39	0.001
Hospital Handoffs	Arabic	54	12.33	2.754		
	Non Arabic	365	13.87	2.743	-3.71	0.0001

Table 12 *continued*

Patient safety culture dimensions	Arabic	n	Mean	Std. Deviation	z value	p-value
Frequency of Event reported	Arabic	58	10.59	2.609		
	Non Arabic	376	10.99	3.053	-1.46	0.145
Overall perceptions of safety	Arabic	54	12.94	1.975		
	Non Arabic	361	13.42	2.064	-1.54	0.123

Table 13

Summary Measures and Test of Significance of the Patient Safety Culture Dimensions among Nurses working different shifts

Patient safety culture dimensions	Type of Shift	N	Mean	std. deviation	Chi-Square	p-value
Supervisor/manager expectations	Day	200	14.27	2.796	0.53	0.77
	Night	35	14.17	2.503		
	Day& Night	184	14.08	2.549		
Organizational learning	Day	206	11.76	1.772	7.15	0.09
	Night	36	11.72	1.701		
	Day& Night	189	12.19	1.623		
Teamwork within units	Day	207	15.60	2.459	4.75	0.09
	Night	34	16.18	1.946		
	Day& Night	192	16.04	2.413		
Feedback & communication	Day	202	11.28	2.382	3.47	0.18
	Night	36	11.97	1.905		
	Day& Night	190	11.65	2.276		
Nonpunitive response to error	Day	203	7.94	2.351	0.19	0.91
	Night	35	7.86	2.225		
	Day& Night	185	7.77	2.173		
Staffing	Day	200	10.79	2.443	1.71	0.43
	Night	35	10.23	2.327		
	Day& Night	182	10.45	2.356		
Communication Openness	Day	202	9.84	2.350	0.79	0.67
	Night	36	9.97	2.311		
	Day& Night	191	9.98	2.208		
Hospital management support	Day	204	10.85	2.058	8.53	0.01
	Night	35	11.29	1.690		
	Day& Night	190	11.45	1.975		

Table 13 continued

Patient safety culture dimensions	Type of Shift	N	Mean	std. deviation	Chi-Square	p-value
Team work across hospital units	Day	203	13.76	2.633	3.71	0.17
	Night	36	14.19	2.459		
	Day& Night	188	14.10	2.721		
Hospital Handoffs	Day	197	13.43	2.886	3.22	0.20
	Night	37	13.51	2.490		
	Day& Night	182	13.93	2.743		
Frequency of Event reported	Day	203	10.78	3.025	1.82	0.40
	Night	36	10.97	2.923		
	Day& Night	193	11.12	2.948		
Overall perceptions of safety	Day	196	13.51	2.027	4.78	0.092
	Night	34	13.74	1.880		
	Day& Night	185	13.13	2.104		

Table 14

Correlation Matrix Among Dimensions Of Patient Safety Culture

	1	2	3	4	5	6	7	8	9	10	11	12
1. Supervisor/manager expectations	1.000											
2. Organizational learning	0.283**	1.000										
3. Teamwork within units	0.331**	0.465**	1.000									
4. Feedback & communication about error	0.288**	0.469**	0.361**	1.000								
5. Nonpunitive response to error	0.323**	0.081	0.150**	0.124*	1.000							
6. Staffing	0.227**	-0.157**	0-.010	-0.034	0.223**	1.000						
7. Communication openness	0.371**	0.425**	0.372**	0.567**	0.267**	0.046	1.000					
8. Hospital management support	0.397**	0.457**	0.416**	0.439**	0.241**	-0.021	0.423**	1.000				
9. Teamwork across hospital units	0.371**	0.406**	0.475**	0.430**	0.259**	0.045	0.420**	0.572**	1.000			
10. Hospital handoffs	0.346**	0.272**	0.336**	0.277**	0.264**	0.061	0.374**	0.500**	0.568**	1.000		
11. Frequency of events reported	0.160**	0.183**	0.170**	0.271**	0.143**	0-.044	0.178**	0.131**	0.197**	0.134**	1.000	
12. Overall perceptions of safety	0.293**	0.259**	0.165**	0.335**	0.274**	0.158**	0.315**	0.375**	0.343**	0.314**	0.167**	1.000

Research Questions #5: To what extent do patient safety culture dimensions (unit level and hospital level) predict nurses' perceptions of patient safety culture outcome dimensions?

To address Research Question 5, step-type (backward, forward, and step-wise) regression analysis was used.

Table 15. *Predicting Frequency Events Reported Dimension*

Variables	**Parameter Estimate**	**t value**	**P-value**
Teamwork within units	0.152	2.090	0.037
Feedback and communication about error	0.396	4.739	0.000
Non-punitive response to error	0.150	2.024	0.044
Communication openness	-0.177	-2.027	0.044

The optimal model consisted of Teamwork within units, Feedback & communication about error, Non-punitive response to error, and Communication openness dimensions in predicting Frequency events reported (Table 15).

Table 15 indicates that 10% (Adjusted R square = 0.10, F=10.3, p = 0.0001) of the variance in the dependent variable (frequency events reported) was explained by the independent variables (teamwork within units, feedback and communication about error, non-punitive response to error, and communication openness) and all those independent variables have a significant effect on the dependent variable .

Table 16. *Predicting Overall Perception of Safety Dimension*

Variables	**Parameter Estimate**	**t value**	**P-value**
Organizational learning	0.134	2.204	0.028
Feedback and communication about error	0.124	2.652	0.008
Non-punitive response to error	0.197	4.677	0.000
Staffing	0.124	3.245	0.001
Hospital management support	0.163	2.820	0.005
Hospital handoffs	0.090	2.451	0.015

The optimal model consisted of the organizational learning, feedback & communication about error, non-punitive response to error, staffing, hospital management support, and hospital handoffs dimensions in predicting overall perception of safety (Table 16).

Table 16 shows that 32% (Adjusted R square = 0.32, F=26.7, p = 0.0001) of the variance in the dependent variable (overall perception of safety) was explained by the independent variables (organizational learning, feedback & communication about error, non-punitive response to error, staffing, hospital management support, and hospital handoffs) and all those independent variables have a significant effect on the dependent variable.

Table 17. *Predicting Patient Safety Grade Dimension*

Variables	**Parameter Estimate**	**t value**	**P-value**
Organizational learning	-0.081	-3.169	0.002
Teamwork within units	-0.032	-1.711	0.088
Communication openness	-0.036	-1.927	0.055
Hospital management support	-0.061	-2.574	0.011
Teamwork across hospital units	-0.044	-2.503	0.013

The optimal model consisted of the organizational learning, teamwork within units, communication openness, hospital management support, and teamwork across hospital units dimensions in predicting patient safety grade (Table 17).

Table 17 shows that 28% (Adjusted R square = 0.28,F=25.7, p = 0.0001)) of the variance in the dependent variable (patient safety grade) was explained by the independent variables (organizational learning, teamwork within units, communication openness, hospital management support, and teamwork across hospital units) and all those independent variables have a significant effect on the dependent variable.

Table 18. *Predictors Events Reported Past 6 Month*

Variables	**Parameter Estimate**	**t value**	**P-value**
Supervisor/manager expectations	0.057	2.723	0.007
Organizational learning	-0.062	-2.020	0.044
Hospital management support	-0.073	-2.396	0.017
Hospital handoffs	-0.044	-2.255	0.025

The optimal model consisted of supervisor/manager expectations, organizational learning, hospital management support, and hospital hand offs dimensions in predicting events reported past 6 month (Table 18).

Table 18 shows that 0.07% (Adjusted R square = 0.07, F=7.07, p = 0.0001) of the variance in the dependent variable (Events Reported Past 6 Month) was explained by the independent variables (supervisor/manager expectations, organizational learning, hospital management support, and hospital handoffs) and all those independent variables have a significant effect on the dependent variable .

CHAPTER 5

DISCUSSION

Chapter 5 discusses interpretation of research results, recommendations, and implications for nursing practice, administration, education, and research.

Summary of Research Findings

The purpose of this research is to identify the systems factors that Registered Nurses perceive as contributing to a culture of patient safety and to study the effects these perceptions have on nurses' participation and engagement in the patient safety culture at King Fahad Medical City, Saudi Arabia.

Summarization and interpretation of research findings are organized by research question.

The following research questions were addressed:

Research Question 1: What are nurses' perceptions of patient safety culture?

Research Question 2: How do nurses' perceive the error reporting status?

Research Question 3: What is the relationship among selected demographic variables and nurses' perceptions of patient safety culture?

Research Question 4: What are the relationships among safety culture dimensions?

Research Question 5: To what extent do safety culture dimensions (unit level and hospital level) predict nurses' perceptions of patient safety culture outcome dimensions?

Research Question 1: What are nurses' perceptions of patient safety culture?

Sorra & Nieva (2004) defined patient safety culture areas of strengths as those survey dimensions where the overall mean positive response rate to items in the dimension was 75% or more, indicating that respondents answered "Strongly Agree/Agree" or "Most of the time/Always", or when 75% or more of respondents disagreed (strongly disagree/disagree) with

negatively worded items. Individual survey items within dimensions can also be considered areas of strength where the item positive response rate was 75% or greater. Similarly, areas needing improvement are identified as those items where 50 percent or more of respondents did not answer positively (they either answered negatively or “Neither” to positively worded items, or they agreed with negatively worded items).

According to Sorra & Nieva (2004), the 75 and 50 percent cutoff is somewhat arbitrary, and the researcher may choose to report strengths and areas needing improvement using a higher or lower cutoff percentage. The reader should note that dimensions or individual items with positive response rates between 50%-75% do not fit AHRQ's criteria for either area of strength or area needing improvement. AHRQ recommends that these dimensions and items be evaluated by individual organizations with respect to other dimension or item scores to decide what actions need to be taken.

For the purpose of this study, the dimensions with positive response rates that fall in the middle (between 50%-75%) were not covered. This is because of the notion that a hospital can only focus on improving a few areas at a time. Hospitals can't improve everything at once. This is especially true when resources are scarce. Moreover, the hospital should allocate time and resources to improve areas that need more attention, that are considered area of weakness, those that fall below 50%.

Based on the positive responses for each of the 12 dimensions of the patient safety culture dimensions, results suggest that two areas were identified as areas of strength: *hospital management support for patient safety* (90%) and *organizational learning* (82%); and the following dimensions met AHRQ's definition of areas needing improvement: *hospital handoffs*

and transitions (22%), *communication openness* (36%), *non-punitive response to error* (49%), and *supervisor/manager expectations and actions promoting patient safety* (49%)

The following sections discuss areas of patient safety culture strengths and areas for improvement identified from findings in this study. The researcher compares KFMC study findings to findings in US hospitals using HSOPSC.

Areas of Strength

Hospital management support for patient safety

For this study, the overall positive response rate on *hospital management support for patient safety* was 90%. This response rate was higher than the average positive response rate of US hospitals (70%), which indicated areas needing improvement for US hospitals.

The finding of this study was similar to those reported by Abbas, Bassiuni and Baddar (2008) which showed that respondents perceived a significantly stronger commitment to patient safety from hospital management. This study included 400 front-line clinical staff members working in general medical and surgical wards, intensive care units (ICUs), and paramedical departments at Alexandria Main University Hospital. Similarly a survey of nurses working in 26 nursing homes in Ohio showed clear management support and communication of safety goals. Approximately 40% of nursing staff indicated that management seriously considered staff suggestions to improve resident safety (Hughes & Lapane, 2006).

Cultural differences between nurses and hospital management may have contributed to this high perception. Most of the hospital management leadership positions at KFMC are occupied either by physicians or nurses who are from the Far East (Philippines, India, and South Africa), who mainly follow traditional style beliefs, i.e., nurses follow physician’s orders.

Based on the positive response rate to hospital management support for patient safety, nurses and nurses managers will not hesitate to request or ask for supplies, equipment, and training that leads to improved patient safety. Furthermore, management encourages the hospital staff to participate in patient safety strategies. Hospital management support for patient safety confirms the creation of an organizational culture that puts patient safety at the forefront of KFMC's value system.

Although there was a 90% positive response toward the hospital management's support for patient safety, the implementation of regulations such as patient safety leadership rounds may enhance this positive perception. KFMC leaders should visit patient care units to ask staff about their patient safety concerns, ensure follow-up to improve quality of care, and continue support for patient safety.

Overall, KFMC leaders have both the responsibility and the authority to position safety as a strategic priority. Patient safety was one of the strategic goals for KFMC. The researcher anticipated the positive response rate of nurses toward hospital management support for patient safety because patient safety was among the organization's stated strategies goals. KFMC strategic goals are abbreviated as S.U.C.C.E.S.S, which stands for Strategy focused, Utilization, Collaboration, Competence, Empowerment, Safety and Systems.

Finally, the essential elements of successful patient safety culture include the commitment of leadership to empowering and engaging all employees in ongoing watchfulness through communication, nonhierarchical decision making, constrained improvisation, training, rewards and incentives.

Organizational learning

The overall positive response rate for this study on organizational learning was 82%. This response rate was higher than the average positive response rate of US hospitals (score of 71%), which indicated an area needing improvement for US hospitals.

Ninety-one percent of KFMC nurses agreed that the organization was actively doing things to improve patient safety. Similarly, 80% of nurses at KFMC agreed that mistakes have led to positive changes. Finally, 83% of nurses at KFMC agreed that after changes are made to improve patient safety, they evaluate their effectiveness. High scores in organizational learning might have been the result of the KFMC environment providing organizational learning skills. Another explanation might be that KFMC administration highly values and supports the nurses' education and development.

Management deals with errors at KFMC as an opportunity for improvement and efforts are made to encourage staff to learn from those incidents. Since the perception of nurses regarding organizational learning is high (82%), this indicates that staff learn from each other's mistakes. This is expected to lead to lower numbers of causes related to the same risk.

This finding is consistent with prior studies. For example, Tucker and Edmondson (2003) linked a lack of organizational learning to poor nursing and patient outcomes. Tucker and Spear (2006) studied nurses' work and found that organizational and quality improvements impact nurse and patient outcomes for the better. In the perinatal setting, Draycott, et al. (2006) associated organized training practices among physicians and nurses with improved infant outcomes.

According to IOM, organizational learning has been documented as playing a central role in the development and maintenance of safety in organizations (IOM, 2004). In order to improve

patient safety, organizational cultures are needed which enable learning to take place at every level, particularly learning which arises from occasions where errors occur or care could be improved. Improvement in patient safety results primarily from organizational and individual learning that takes place within organizations, which results in changes in organizational culture that create more openness and accountability (Firth-Cozens, 2001).

Areas For Improvement

Hospital handoffs & transitions

The overall positive response rate for this study on hospital handoffs and transitions was 22%. This response rate was much lower than the average positive response rate of US hospitals (a score of 44%), indicating an area needing improvement for both US hospitals and KFMC.

Findings from this study indicate that the *hospital handoffs and transitions* dimension seems to have been a negative issue for the majority of respondents and warrants further evaluation of the contribution to patient safety culture. Nurses at KFMC come from different cultures and speak different languages. They tend to speak their native languages, which can lead to suspicion from other members of the team at their unit. Based on that, there is high risk for nurses to miss information and data related to patients' situations.

KFMC mandates that patient handoffs and charting be conducted in the English language, which may contribute to inefficient communication during the handoffs. This finding has a great negative impact on patient safety at KFMC, because patients are at high risk of medical errors due to poor handoffs.

KFMC management needs to implement a standardized approach to communication between staff at change of shifts and between different patient care units in the course of patient

transfers. KFMC should incorporate training on effective handoff communication into the educational curricula and continuing professional development for healthcare professionals.

This finding is relevant and consistent with other researchers who found that *hospital handoffs and transitions* have an impact on patients' safety (Borowitz, Waggoner-Fountain, Bass & Sledd, 2008; Stevens, 2008; Sanfey, Stiles, Hedrick & Sawyer, 2008; Patterson, 2008).

Studies that have analyzed near misses and adverse events have implicated handoffs in a number of cases (McCann, McHardy & Child, 2007; Schultz, Carayon, Hundt & Springman, 2007). One study of 889 malpractice claims found that information transfer breakdowns at the handoff contributed to errors in 19% of the cases involving medical trainees and 13% of the cases involving non-trainees (Singh, Thomas, Petersen & Studdert, 2007). One study of 134 post-operative sign-outs in a pediatric intensive care unit checked for 18 categories of information deemed critical. Researchers found miscommunication occurred in 100% of the cases, with a median of 5 items missing (Castledine, 2006). The malpractice sample studied by Greenberg, et al. (2007) also found many cases involving handoffs, and highlighted especially the role of status asymmetry.

Results of this study suggest that KFMC leaders need to implement strategies that improve the handoffs system. This system might include accuracy, structure, and communication processes of handoffs. As a result of that, continuity of care will be enhanced and patient safety will be dramatically improved.

Communication openness

The overall positive response rate for the *communication openness* dimension was 36%, lower than the positive response rate mean (62%) for US hospitals, and therefore a patient safety

area for improvement. Study findings indicate that the nursing staff is not able to speak freely to discuss safety issues, or raise concerns related to mistakes or errors that may affect patient safety.

Cultural and language differences among staff may contribute to the poor communication openness. The relationship between nurses and their direct managers doesn't seem to be conducive to open communication. This may be due to poor communication and lack of support expected from direct managers. Nursing workload definitely affects the time that a nurse can allot to various tasks. Under a heavy workload, nurses may not have sufficient time to communicate with their managers or even with other nurses in the same unit.

Poor communication can directly impact patient safety at KFMC. Technology can be utilized to improve communication and reduce the gap between the nurses and management. For example, using electronic mail and networking may improve communication among nurses and mangers and also improve team relationships. KFMC may try other communication modalities, such as voice mail, especially in areas with high nursing workloads, which may increase communication openness.

Better communication between workers at KFMC is needed to increase the quality of work and the effectiveness of patient safety cultures. Standardized communication can enhance communication among healthcare providers and improve patient safety. The importance of human factors in the communication process must be considered by KFMC. The education process needs to prepare healthcare providers at KFMC to work collaboratively and respectfully together to enhance open communication.

According to JCAHO, two-thirds of the root causes of sentinel events in the period 1995-2005 were communication-related. A sentinel event is defined by the JCAHO as any unanticipated event in a healthcare setting resulting in death or serious physical or psychological

injury to a person or persons, not related to the natural course of the patient's illness (JCAHO, 2007).

Communication openness is both an antecedent and attribute of a patient safety culture; it is crucial in ensuring patient safety. Studies show that communication in organizations with a positive patient safety culture tends to be more open, less blameful and more supportive (Milstead, 2005; Hoban, 2006; Kalisch &Aebersold, 2006). Murphy (2006) demonstrated that many errors in organizations were unreported simply because of fear of blame or punishment by the manager as well as by peers. This would clearly lead to potential injury to patients and influence learning from experience by the team.

Researchers in other high risk industries report that lack of communication leads to unsafe worker behaviors including errors, policy and procedure violations, and not reporting events or any problems that may affect patient health conditions (Hoffman, Donoghue & Duffield, 2004; Zohar, 1980). Better communication between workers is needed to increase the quality of work and the effectiveness of patient safety cultures.

Non-punitive response to error

The overall positive response rate for this study on the *non-punitive response to error* dimension was 49%, higher than the positive response rate (44%) for US hospitals, but still an area for improvement for both US hospitals and KFMC. Parenthetically, results from the AHRQ studies indicated that most US hospitals (2009) reported *non-punitive response to error* as the lowest dimension.

This negative response wasn’t anticipated due to the positive responses rate of nurses to hospital management support for patient safety (90%). However, the existing environment creates a fear of reporting. Nurses at KFMC are afraid of the consequences of poor performance

and may associate it with loss of their jobs. If this problem can be overcome, there is a great potential for nurses to benefit from their mistakes.

Findings from this study also indicate that nurses do not feel free to report errors or issues related to patient safety. This may be due to many reasons, such as fear of punishment, blame, and potential for shame, which are reasons documented in the literature related to error reporting (Hughes & Lapane, 2006; Kapp, 2003; Lawton & Parker, 2002; Wagner, Capezuti & Ouslander, 2006).

These results suggest that a non-punitive environment has not yet been established at KFMC. KFMC should focus on the barriers for not reporting the errors to improve patient safety. Administrators, for example, should be educated to focus on the system as a potential cause of the error rather than focusing on the individual. Policies and procedures should clearly define medical errors and these manuals should be available to all staff. Medical error definitions should be agreed upon through all levels of management in healthcare organizations. Errors cannot be totally eliminated under any and all circumstances; however learning from these errors should be the strategy to prevent more dramatic errors from happening. This concept, if understood by mangers and staff, may decrease staff fear of reporting errors. If reporting errors is time and effort consuming in an organization, relatively easy and less time consuming methods should be the target of the organizations' management. This problem is more prominent when contacting physicians and, thus, physicians should be educated about the need to respond to such reports quickly to help improve the reporting situation. Patient safety concepts should be included in healthcare curriculums, because team members' knowledge and attitude toward medical error, human factors, and safety climate play a key role in fostering a non-punitive error reporting system. The following information could serve as educational content:

- Nurse's perceptions of error reporting barriers have multiple facets including organization, system, individual, and culture.
- Barriers are affected by organizational and individual factors simultaneously.
- Without reporting barriers, learning from errors is promoted.

Supervisor/manager expectations & actions promoting patient safety

The overall positive mean response rate of the supervisor expectations and actions promoting patient safety dimension was (49%), lower than the average positive response rate of the US hospitals score of 75%.

This finding is relevant since research strongly suggests that supervisor communication is critical for creating, developing, and maintaining an effective safety culture (O'Toole, 2002; Flin, Mearns, O'Connor & Bryden, 2000).

The findings of this study were similar to those reported by Scherer & Fitzpatrick (2008) which showed there were significant differences between physicians and RNs in the safety culture dimensions of "supervisor/manager expectations and actions promoting safety" and "feedback and communication about error".

In more effective patient safety cultures, supervisors had more supportive styles of leadership, initiated discussions about safety, and provided positive feedback on safety issues (Hoffman, Morgeson & Gerras, 2003; Hoffman & Morgeson, 1999). Additionally, research shows that where supervisors have ongoing communication with nursing staff about issues related to patient safety, nurses speak up freely to share their thoughts and ideas, and have reduced anxiety and fear about reporting mistakes and errors (Zohar, 2002a; 2003). Findings from this study also suggest that KFMC leaders may want to consider implementing strategies to

teach and facilitate supervisor behaviors that encourage the nursing staff to report information about safety, and to contribute and participate in safety initiatives.

Research Question #2: How do nurses perceive the assessment of the frequency of medical error reporting?

The results of this study revealed that if a mistake is made, caught and corrected before reaching the patient, or if there is no potential harm from the mistake, errors are more likely to be reported. As the potential for harm increases, the more likely errors are to be reported even if they do not cause harm. This was apparently due to the fact that harm to the patient was possible but had not yet occurred and therefore was still preventable. Results of this study indicate that nurses were reporting when a mistake was almost made but was caught or corrected, or when the mistake did not harm the patient.

Apparently staff did not feel the need to report when an outcome was already clear. However, learning from near misses can be very important to increasing patient safety. The IOM (2004) defined near misses as “any event that could have had adverse consequences but did not, and was indistinguishable from fully-fledged adverse events in all but outcome.” (IOM, 2000, p. 294). Thus, reporting should include those situations where an error was “caught”.

Forty-four percent perceived that mistakes were held against them, and they perceived the culture to be punitive in nature when it comes to making mistakes. The nurses are written up, rather than the problem and they worry that the mistake will be kept in their personnel file.

The findings for this dimension may be due to factors similar to those that influenced responses to items on the non-punitive response dimension. Reasons for nurses not reporting errors may be due to fear of punishment and losing their jobs. Results of this study suggest that KFMC leaders need to implement strategies that support and encourage nursing staff to report

errors or any near misses for purposes of learning about how errors occur, and for improving the quality of care and patient safety. KFMC needs to provide policies and processes for reporting errors that include a clear definition of a reportable error. Special consideration might be given to whether all errors need to be formally reported with incident reports.

Research Question 3: What is the relationship among selected demographic variables and nurses' perceptions of patient safety culture?

The relationship between nurses' perceptions of patient safety culture and selected demographics (gender, age, level of education, years of experience, Arabic vs. non-Arabic speaking, and length of shift) was analyzed. For gender, there were significant differences in supervisor/manager expectations, organizational learning, feedback and communication about error, non-punitive response to error, communication openness, management support for patient safety, teamwork across hospital units, and hospital handoffs and transitions between male and female nurses. Female nurses evaluated their patient safety culture more positively than male nurses.

This finding may have to do with gender differences in looking at things. Females may be more optimistic than males, or this could be due to the belief that females are generally more passionate when compared to males. This also could also be attributed to the culture itself; that being female is associated with caring behaviors and the expectation society attaches to females as caregivers.

There were statistically significant correlations between nurse age and the following patient safety culture dimensions: supervisor/manager expectations, organizational learning, feedback and communication about error, hospital management support for patient safety, and hospital handoffs and transitions. Nurses in their forties and fifties evaluated patient safety

culture more positively than did those in their twenties and thirties. Based on this finding, it could mean that younger nurses put less emphasis on patient safety issues than senior nurses. This could be attributed to professional responsibility, maturity and accountability, as nurses in the forties and fifties understand the roles and responsibilities of patient safety more than younger nurses. Age and professional maturity makes them understand the problems associated with poor care and negligence and the consequent ramifications associated with professional responsibility. Senior nurses may tend to view issues more objectively. Therefore the senior nurses should be utilized as mentors and role models for younger nurses regarding patient safety initiatives.

For *level of education*, the results were not significantly correlated to any of the HSOPSC dimensions. Surprisingly, the level of nursing education did not make much difference in perception of nurses on patient safety culture. This finding is congruent with a study done by Kratina (1990), which suggested no difference in perception of patient safety culture between nurses with different educational levels. This result might be related to a lack of clear leveling of the educational content on patient safety in the baccalaureate and associate degree nursing educational programs. More research is needed to compare the content of different levels of nursing education on patient safety, patient safety culture, and their impact on students' perceptions and patient care outcomes.

There were statically significant differences in *years of experience* and the four patient safety culture dimensions of supervisor/manager expectations, organizational learning, teamwork within units, and feedback and communication about error. Work experience was significantly associated with perception of the patient safety culture. Nurses who had worked at nursing more

than 11 years gave more positive answers. On the other hand, nurses who had worked at nursing from 1 to 5 years showed the worst perception of the patient safety culture.

This finding may be attributed to the fact that more experienced nurses have a broader perspective and better understanding of patient care than less experienced nurses. In addition, less experienced nurses need more time to learn about patient safety issues. This corresponds with findings from previous studies showing that work experience affects the clinical decision-making process (Cho & Jeong, 1999; Hamers, Abu-Saad & Halfens, 1994; Lamond, Crow, Chase, Doggen & Swinkels, 1996; Noyes, 1995).

The findings of this study regarding more negative attitudes found in nurses with less than 11 years of work experience support the findings of previous studies (Lim & Yi, 2004; Park, et al., 2001). Some studies have explained these negative attitudes as being caused by high levels of work-related stress and lower job satisfaction (Byun & Hong, 2002; Holden, Watts & Walker, 2009; Yoon & Cho, 2004).

In all patient safety culture dimensions, there were statically significant differences in scores between Arabic and non-Arabic speaking nurses. Non-Arabic speaking nurses evaluated their patient safety culture more positively than Arabic speaking nurses.

This finding was not anticipated, because Arabic nurses speak the same language as the patients at KFMC. This finding may be due to different training and education systems, which may affect patient safety perception positively or negatively. Therefore, it seems that Arabic nurses should be exposed to more education and training related to patient safety issues.

For the type of shifts nurses usually work, the *organizational learning* and *hospital management support for patient safety* dimensions were statistically significant. Nurses working

the day shift evaluated their patient safety culture more positively than those working nights or night/day.

This finding can be attributed to day shift nurses being more involved in the patient safety activities and initiatives that normally do take place during the day. Day shift nurses have more contact with managers, which may improve their awareness and perception. Finally, day shift nurses have more resources than night shift nurses because of their exposure to multidisciplinary teams such as quality team, risk management, and infection control. To improve the night shift nurses' perceptions about patient safety, work schedules could be alternated between day and night shifts to give the chance for the night shift staff to have more exposure to patient safety activities and initiatives. In addition, night shift nurses should be encouraged to attend more in-services education and training programs related to patient safety.

Research Question 4: What are the relationships among safety culture dimensions?

This study revealed a significantly positive correlation among dimensions of patient safety culture. *Staffing* was the only dimension that was significantly negatively correlated with some of the patient safety culture dimensions. The high inter-correlation between *teamwork across hospital units* and *hospital management support for patient safety* was ($r = 0.57$, $p < .001$). This finding points to the important role that hospital management plays in the advancement of patient safety culture. Nurses gave their units higher patient safety marks when they felt the hospital management actively supported safety.

On the other hand, researchers report teamwork across hospital units and familiarity with co-workers as relatively important among workers (Rudman, Bailey, Garrett, Peden, Thomas & Brown, 2006), and that knowing what to expect from colleagues is very important to maintaining safety in work. For example, aviation researchers found that staff who had flown together for

several days made fewer errors than teams who had not worked together, and teamwork is widely reported as an essential factor in sustaining and increasing safety (Baker, Gustafson, Beaubien, Salas & Barach, 2005). Overall, research on healthcare teams suggests that effective teamwork contributes to reducing errors and mistakes, higher levels of job satisfaction, higher quality of care, an increase in patient safety, greater patient satisfaction with care, increased productivity, and decreased stress levels (Kalisch, Landstrom & Hinshaw, 2009; Rudman, Bailey, Garrett, Peden, Thomas & Brown, 2006).

Interestingly, *teamwork within units* had the lowest relationship with staffing. Findings from this study indicate that staffing and workload factors seem to have been a negative issue for the majority of respondents and warrant further evaluation for their contribution to patient safety culture. This finding is relevant and consistent with other researchers who found that staffing and workload had an impact on patients' health conditions (Aiken, Clarke, Sloane, Sochalski & Silber, 2002; Needleman, Buerhaus, Mattke, Stewart & Zelevinsky, 2002; Rogers, Hwang, Scott, Aiken & Dinges, 2004). Results of this study and related literature suggest that KFMC leaders need to pay attention to the impact of staffing numbers and workload on the quality of patient outcomes.

Research Question 5: To what extent do safety culture dimensions (unit level and hospital level) predict nurses' perceptions of patient safety culture outcome dimensions?

Results of the multiple regression analysis revealed the most significant safety culture dimensions (unit level and hospital level) (independent variables) that predicted the patent safety outcome. The four patient safety outcome dimensions of HSOPSC were the dependent variables frequency event report, overall perception of safety, number of events reported, and patient safety grade.

For the outcome variable *frequency event report*, four predictors (*teamwork within units*, *feedback and communication about error*, *non-punitive response to error*, and *communication openness*) had a significant effect on the dependent variable. In addition, six predictors (organizational learning, feedback and communication about error, non-punitive response to error, staffing, hospital management support, and hospital handoffs) significantly predict the overall perception of safety.

For the outcome variable *patient safety grade*, five predictors were identified (organizational learning, teamwork within units, communication openness, hospital management support, and teamwork across hospital units) that significantly predict patient safety grade.

Finally, four independent variables (supervisor/manager expectations, organizational learning, hospital management support, and hospital handoffs) significantly predict *number of events reported* in the past 12 months.

There were no similar previous studies that can be used to compare the results of these multiple regressions. However, this question again indicated that the two dimensions, *hospital management support* and *organizational learning* are the most predicting dimensions for projecting patient safety at KFMC.

Conclusion

The purpose of this research is to identify the systems factors that RNs perceive as contributing to a culture of patient safety and to study the effects these perceptions have on nurses' participation and engagement in the patient safety culture at King Fahad Medical City in Saudi Arabia.

Overall, 52% of the nurses positively perceived patient safety culture at KFMC, which is considered an opportunity for improvement according to AHRQ's definition of areas needing improvement. Only 13% (n= 63) gave their work area or unit a safety grade of A (Excellent). Half the respondents gave grade B (Very good) (n= 222), more than one-third gave the grade of C (Acceptable), and only 3% (n=14) gave a grade of D (Poor).

Half of the respondents (51%, n=248) reported no safety events over the past six months, 28% (n=136) responded that they filled out and submitted 1 to 2 event reports, 10% (n=50) responded that they filled out and submitted 3 to 5 event reports, and 4% (n=19) responded that they filled out and submitted 6 event reports or more.

Nurses responded most positively to two dimensions. They were *hospital management support for patient safety* and *organizational learning*. Nurses responded most negatively to the following dimensions: hospital handoffs and transitions, communication openness, non-punitive response to error, and supervisor/manager expectations and actions promoting patient safety.

There were significant differences between nurses' perceptions of patient safety culture and gender, age, years of experience, Arabic vs. non-Arabic speaking, and length of shift. Astonishingly, for the level of education, the results were not significantly correlated to any of the HSOPSC dimensions.

King's Conceptual System was utilized in this research as the theoretical framework within which to study patient safety culture. This is the first study to examine nurses' perceptions about patient safety culture guided by a nursing theory. King's Conceptual System proved to be an excellent theoretical framework. Utilizing King's Conceptual System will not only develop nursing knowledge, but will impact the overall nursing discipline and patient safety culture in Saudi Arabia. King's Conceptual System was useful in guiding this research, which attempts to describe nurses' perceptions about patient safety culture at KFMC. King's Conceptual System supported research findings which indicated that concepts within personal systems were strong (represented by *organizational learning* and *nursing work environment*). Conversely, the results showed weakness within the interpersonal and social systems. Those areas need to be addressed and further studies are needed to expand knowledge in those areas.

The findings from this large study (500 nurses) provide a description of the current status of patient safety in a representative tertiary hospital in Saudi Arabia from the nurses' perspective. The results of this study suggest that KFMC has areas of strength and also areas needing improvement with regard to nurses' perceptions of safety culture on multiple units. The findings will not only provide a baseline from which to work, they will also help raise safety awareness. Results are expected to lead to the development of interventions aimed at improving patient safety.

Implications and Recommendations

Nursing Practice

This study is useful in directing attention to the systems factors that Registered Nurses perceive as contributing to a culture of patient safety. The results of this study suggest there is room to improve patient safety culture. The findings in this study provide important baseline information about nurses' perceptions in Saudi Arabia hospitals. Although data were collected only in one Saudi hospital and the results may not adequately represent the actual situations of other Saudi hospitals, the study generated some meaningful information to understand patient safety culture in Saudi health care settings.

The findings of this study can be translated for clinical use. To build a more positive hospital patient safety culture, nurses must be aware of their position which qualifies them to take a leading role in creating a patient safety culture and can have great impact on improving patient safety. In order for them to do so, the hospital and nursing leader might consider the following strategies:

1) Involve senior nursing managers in the safety culture process and plans.
2) Encouraging nurses to speak up and discuss situations on a regular basis will lead to raising awareness and awakening consciousness of patient safety issues.
3) Nursing mangers should spend time visiting front line situations, meeting with staff on different shifts regularly, and creating appropriate channels for staff to voice safety concerns.
4) Create a non-punitive environment and blame-free culture in which people are prepared to report their errors and near-misses.

5) Establish a reporting culture; an environment of trust in which nurses are encouraged, even rewarded, for providing essential safety-related information—but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior.
6) Hire proper and qualified staffing who have a culture that values patient safety.
7) The autonomy of nurses should be promoted to take action when they encounter unsafe situations.

Nursing Administration

The implications for nursing administration are of even more importance. Changing the culture of patient safety requires a vision and a systematic long-term plan that is well communicated throughout the hospital. More importantly, this vision needs to be mutually shared among all healthcare professions. Using the HSOPSC tool can be helpful in providing a base to assess the status of patient safety culture. It can be helpful in developing strategies and action plans that focus on improving weak areas of patient safety culture. This assessment will enable nursing administrators to evaluate the impact of patient safety interventions and identify barriers to improve efforts, and build related policies or procedures. This assessment needs to be conducted over time to track the ongoing progress and to properly allocate budget, resources, and personnel and develop training. Thus, the nursing leadership role is instrumental in creating a healthy patient safety culture.

Finally, with further investigation and evaluation of nurses' perceptions of patient safety culture, hospital management and nursing leadership could evaluate how well they are getting the message of patient safety across to the direct care provider.

Nursing Education

Based on the findings that there is comparably low error reporting at KFMC, it is necessary to establish an appropriate organizational error reporting policy. Most importantly, it is imperative to educate nurses that reporting errors is not shameful. Organizations need to learn from errors to build a safer health care system.

This study provides important information both for primary nursing education as well as nurses' continuing education. Information can be incorporated in undergraduate and graduate education with related topics such as quality improvement, patient safety, and organizational culture. Content should address the impact of medical errors, the importance of establishing organizational or unit safety culture, and the strategies to build safety culture.

Educational programs could include strategies necessary to build a culture of safety, tools to increase the level of teamwork, practical strategies for high hazard areas, adverse events measurements tools and the design of an internal patient safety plan. It is not only important to educate leadership and staff, but also to provide patient safety education to patients and families. This, in turn, will help reduce the likelihood of an adverse incident. Improvement cannot happen without the involvement, assessment, evaluation and the support of the nursing education programs.

Educational programs regarding behaviors/activities on patient safety culture can raise awareness and provide the opportunity of discussions using hypothetical situations. A more positive, lessons-learned approach can be enforced rather than the old punitive blaming aspects of mistakes.

Nursing Research

Up to now, little research on nursing or other healthcare worker perceptions about patient safety culture has been conducted in Saudi Arabia. Even though the results of this study provide new insight into nursing staff perceptions about safety culture on their respective units in one Saudi Arabia healthcare organization, additional studies are needed.

The following questions are recommended for future study:

- What is the relationship between nurses' perceptions of patient safety and quality and safety indicators such as infection rate, readmission, wrong site surgery and length of stay.
- What is the relationship between nurses' satisfaction and their patient safety perceptions?
- What is the relationship between nurses' perceptions of patient safety and continuous medical education and certifications?

The following are recommendations for future study:

- Further research is needed to replicate this study in other health care systems; data from other health care systems can provide opportunities for statistical testing of differences across individual units, departments, facilities, and organizations within a system.
- Conducting similar researches in other areas of the Saudi Arabia is necessary to determine hospital patient safety culture. This would increase the generalizability and validate the current findings.
- The study findings also offer possible intervention for future research on patient safety. Possible interventions derived from the current study include the enhancement of supervisor/manager safety commitment and strengthening areas of weakness, such as

hospital handoffs procedures, communication openness and non-punitive response to errors.

- Lastly, in order to deliver a high quality of care, it is important to assess patients' perceptions of hospital patient safety culture and compare them with the nurses' perceptions.

APPENDIX A: APPROVAL LETTER FROM KING FAHAD MEDICAL CITY INSTITUTIONAL REVIEW BOARD

Kingdom of Saudi Arabia
Ministry of Health
King Fahad Medical City

المملكة العربية السعودية
وزارة الصحة
مدينة الملك فهد الطبية

Dear Mr. Ahmad Aboshaiqah,

May 3, 2009
ERRC Number: 09-008

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: Patients Safety Culture: A Baseline Assessment of Nurses' Perceptions in Saudi Arabia Hospital.

Please be informed that in conducting this study, you as the Principal Investigator is 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 May 2, 2010 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

APPENDIX B: HIC APPROVAL

WAYNE STATE UNIVERSITY

HUMAN INVESTIGATION COMMITTEE
101 East Alexandrine Building
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu

Full AAHRPP Accreditation

CONCURRENCE OF EXEMPTION

To: Ahmad Aboshaiqah
College of Nursing

From: Ellen Barton, Ph.D. E. Barton /G
Chairperson, Behavioral Institutional Review Board (B3)

Date: June 03, 2009

RE: HIC #: 058309B3X

Protocol Title: Patient Safety Culture: A Baseline Assessment of Nurses' Perceptions in a Saudi Arabia Hospital

Sponsor:

Protocol #: 0905007145

The above-referenced protocol has been reviewed and found to qualify for **Exemption** according to paragraph #2 of the Department of Health and Human Services Code of Federal Regulations [45 CFR 46.101(b)].

- Information Sheet

This proposal has not been evaluated for scientific merit, except to weight the risk to the human subjects in relation to the potential benefits.

- Exempt protocols do not require annual review by the IRB.
- All changes or amendments to the above-referenced protocol require review and approval by the HIC **BEFORE** implementation.
- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the HIC Policy (http://www.hic.wayne.edu/hicpol.html).

NOTE:

1. Forms should be downloaded from the HIC website at each use.
2. Submit a Closure Form to the HIC Office upon completion of the study.

APPENDIX C: HOSPITAL SURVEY ON PATIENT SAFETY CULTURE

INSTRUCTIONS

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital and will take about 10 to 15 minutes to complete.

- *An "event" is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.*
- *"Patient safety" is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.*

HAVE YOU BEEN WORKING AT KING FAHAD MEDICAL CITY MORE THAN 1 YEAR?

○YES ○NO

Demographics characteristics

This information will help in the analysis of the survey results. Mark ONE answer by filling in the circle.

1. What is your gender?

○ a. Male
○ b. Female

2. What is your age?

○ a. 20-30 ○ b. 31-40 ○ c. 41-50 ○ d. 51- 60

3. What is your highest level of education?

○ a. Associates degree ○ b. Baccalaureate degree
○ c. Master degree ○ d. Doctoral degree

4. How long have you worked in nursing profession?

○ a. Less than 1 year ○ d. 11 to 15 years

○ b. 1 to 5 years ○ e. 16 to 20 years
○ c. 6 to 10 years ○ f. 21 years or more

5. Which one of the following hospitals you are working?
○a. Main hospital ○ b. Women hospital
○ c. Children hospital ○ d. Rehabilitation hospital

6. Type of nursing unit currently assigned to work in:
○a. Medical / Surgical ○ c. Pediatrics ○ e. Critical Care ○ g. Oncology
○ b. Maternity ○ d. Rehabilitation ○ f. Cardiac ○ h. Neurosciences
○i. Other, please specify: [ ]

7. What is your position in this hospital? Mark ONE answer that best describes your position.
○ a. Staff Nurse ○ b. Charge Nurse
○ c. Head Nurse ○ d. Educator
○ e. Other, please specify: [ ]

8. Are you from Arabic speaking country?
○ a. YES ○ b. NO

9. Which shift do you usually work?
○ a. Day ○ b. Evening
○ c. Night ○ d. Other

10. Length of time working at current hospital:
○ a. less than one year ○ b. More than one year to two years
○ c. More than two years to five years ○ d. Five years or more.

SECTION A: Your Work Area/Unit

In this survey, think of your "unit" as the work area, department, or clinical area of the hospital where you spend *most* of your work time or provide *most* of your clinical services.

Please indicate your agreement or disagreement with the following statements about your work area/unit. Mark your answer by filling in the circle.

Think about your hospital work area/unit…	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. People support one another in this unit	①	②	③	④	⑤
2. We have enough staff to handle the workload	①	②	③	④	⑤
3. When a lot of work needs to be done quickly, we work together as a team to get the work done	①	②	③	④	⑤
4. In this unit, people treat each other with respect	①	②	③	④	⑤
5. Staff in this unit work longer hours than is best for patient care	①	②	③	④	⑤
6. We are actively doing things to improve patient safety	①	②	③	④	⑤
7. We use more temporary (overtime) staff than is best for patient care	①	②	③	④	⑤
8. Staff feel like their mistakes are held against them	①	②	③	④	⑤
9. Mistakes have led to positive changes here	①	②	③	④	⑤
10. It is just by chance that more serious mistakes don't happen around here	①	②	③	④	⑤
11. When one area in this unit gets really busy, others help out	①	②	③	④	⑤
12. When an event is reported, it feels like the person is being written up, not the problem	①	②	③	④	⑤
13. After we make changes to improve patient safety, we evaluate their effectiveness	①	②	③	④	⑤
14. We work in "crisis mode" trying to do too much, too quickly	①	②	③	④	⑤
15. Patient safety is never sacrificed to get more work done	①	②	③	④	⑤
16. Staff worry that mistakes they make are kept in their personnel file	①	②	③	④	⑤
17. We have patient safety problems in this unit	①	②	③	④	⑤
18. Our procedures and systems are good at preventing errors from happening	①	②	③	④	⑤

SECTION B: Your Supervisor/Manager

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report. Mark your answer by filling in the circle.

	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	①	②	③	④	⑤
2. My supervisor/manager seriously considers staff suggestions for improving patient safety	①	②	③	④	⑤
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	①	②	③	④	⑤
4. My supervisor/manager overlooks patient safety problems that happen over and over	①	②	③	④	⑤

SECTION C: Communications

How often do the following things happen in your work area/unit? Mark your answer by filling in the circle.

Think about your hospital work area/unit…	Never ▼	Rarely ▼	Some-times ▼	Most of the time ▼	Always ▼
1. We are given feedback about changes put into place based on event reports	①	②	③	④	⑤
2. Staff will freely speak up if they see something that may negatively affect patient care	①	②	③	④	⑤
3. We are informed about errors that happen in this unit	①	②	③	④	⑤
4. Staff feel free to question the decisions or actions of those with more authority	①	②	③	④	⑤
5. In this unit, we discuss ways to prevent errors from happening again	①	②	③	④	⑤
6. Staff are afraid to ask questions when something does not seem right	①	②	③	④	⑤

SECTION D: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, *how often are they reported?* Mark your answer by filling in the circle.

	Never ▼	Rarely ▼	Some-times ▼	Most of the time ▼	Always ▼
1. When a mistake is made, but is *caught and corrected before affecting the patient*, how often is this reported?	①	②	③	④	⑤
2. When a mistake is made, but has *no potential to harm the patient*, how often is this reported?	①	②	③	④	⑤
3. When a mistake is made that *could harm the patient*, but does not, how often is this reported?	①	②	③	④	⑤

SECTION E: Patient Safety Grade

Please give your work area/unit in this hospital an overall grade on patient safety. Mark ONE answer.

○	○	○	○	○
A	**B**	**C**	**D**	**E**
Excellent	Very Good	Acceptable	Poor	Failing

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospital. Mark your answer by filling in the circle.

Think about your hospital…	**Strongly Disagree** ▼	**Disagree** ▼	**Neither** ▼	**Agree** ▼	**Strongly Agree** ▼
1. Hospital management provides a work climate that promotes patient safety	①	②	③	④	⑤
2. Hospital units do not coordinate well with each other	①	②	③	④	⑤
3. Things "fall between the cracks" when transferring patients from one unit to another	①	②	③	④	⑤
4. There is good cooperation among hospital units that need to work together	①	②	③	④	⑤
5. Important patient care information is often lost during shift changes	①	②	③	④	⑤
6. It is often unpleasant to work with staff from other hospital units	①	②	③	④	⑤
7. Problems often occur in the exchange of information across hospital units	①	②	③	④	⑤
8. The actions of hospital management show that patient safety is a top priority	①	②	③	④	⑤
9. Hospital management seems interested in patient safety only after an adverse event happens	①	②	③	④	⑤
10. Hospital units work well together to provide the best care for patients	①	②	③	④	⑤
11. Shift changes are problematic for patients in this hospital	①	②	③	④	⑤

SECTION G: Number of Events Reported

In the past six months, how many event reports have you filled out and submitted? Mark ONE answer.

- ○ a. No event reports
- ○ b. 1 to 2 event reports
- ○ c. 3 to 5 event reports
- ○ d. 6 to 10 event reports
- ○ e. 11 to 20 event reports
- ○ f. 21 event reports or more

Your Comments
Please feel free to write any comments about patient safety, error, or event reporting in your hospital.

THANK YOU FOR COMPLETING THIS SURVEY.

APPENDIX D: RESEARCH INFORMATION SHEET

Research Information Sheet

Title of Study: Patients safety culture: a baseline assessment of nurses' perceptions in a Saudi Arabia hospital.

Principal Investigator (PI): Ahmad Aboshaiqah
Wayne State University, College of Nursing
+1313 948 9395

Purpose:
You are being asked to be in a research study of patient safety because you are registered nurse currently working in King Fahad Medical City.

Study Procedures:
If you take part in the study, you will be asked to answer the survey. This survey will take about 10-15 minutes to answer.

Benefits:
As a participant in this research study, there will be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks:
There are no known risks at this time to participation in this study.

Costs:
There will be no costs to you for participation in this research study.

Compensation:
You will not be paid for taking part in this study.

Confidentiality:
All information collected about you during the course of this study will be kept without any identifiers.

Voluntary Participation /Withdrawal:
Taking part in this study is voluntary.

Questions:
If you have any questions about this study now or in the future, you may contact Ahmad Aboshaiqah at the following phone number 966503154993 or +1313 948-9395 or . If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation:
By completing the questionnaire, you are agreeing to participate in this study.

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ABSTRACT

PATIENT SAFETY CULTURE: A BASELINE ASSESSMENT OF NURSES' PERCEPTIONS IN A SAUDI ARABIA HOSPITAL

by

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Patient safety (the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery) has become a major academic and public concern in healthcare. In order to promote and sustain a culture of safety in a healthcare organization, healthcare professionals stress the need to understand both individual and system contributions to error events. However, in Saudi Arabia, little is known about nurses' perceptions of patient safety culture.

The purpose of this research is to identify the systems factors that Registered Nurses (RNs) perceive as contributing to a culture of patient safety and to study the effects these perceptions have on nurses' participation and engagement in the patient safety culture at King Fahad Medical City (KFMC), Saudi Arabia. King's conceptual system was utilized as the theoretical framework for this study.

This study used a quantitative research methodology with a descriptive/correlation design. The sample of this study was registered RNs at KFMC, Saudi Arabia. The Hospital Survey on Patient Safety Culture (HSOPSC) instrument was used to measure perceptions of nurses on patient safety culture.

Copies of the surveys were distributed to 600 RNs. A total of 500 questionnaires were returned. Among these returned questionnaires, 55 were excluded because they had missing responses on more than one complete section of the questionnaire. The total response rate for this study was 83%.

Overall, 52% of the nurses positively perceived patient safety culture at KFMC, which is considered an opportunity for improvement according to AHRQ's definition of areas needing improvement. Nurses responded most positively to two dimensions, *hospital management support for patient safety* and *organizational learning*. Nurses responded most negatively to the dimensions of *hospital handoffs and transitions*, *communication openness*, *non-punitive response to error*, and *supervisor/manager expectations and actions promoting patient safety*.

There were significant differences between nurses' perceptions of patient safety culture and gender, age, years of experience, Arabic vs. non-Arabic speaking, and length of shift; but astonishingly, for *level of education*, the results were not significantly correlated to any of the HSOPSC dimensions.

Findings from this study provide a description of the current status of patient safety at King Fahad Medical City from the nurses' perspective. The findings will not only provide a baseline from which to work, but they will help raise safety awareness throughout the organization and identify areas most in need of improvement. Findings will lead to the development of interventions to improve patient safety in Saudi Arabia hospitals.

AUTOBIOGRAPHICAL STATEMENT

Educational Data

- **PhD in Nursing, College of Nursing, Wayne State University,** GPA 3.92/4, 2006 - 2010.
- **Graduate Certificate in Nursing Education,** College of Nursing, Wayne State University, Michigan, USA, 2009.
- **Master in Health & Hospital Administration,** GPA 4.13/5, King Saud University, Kingdom of Saudi Arabia, June 2005.
- **M.S. in Health Systems Management,** GPA 3.8/4.0, George Mason University, Fairfax, VA, USA, August 2003
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- **B.S. in Nursing,** GPA 3.5/4.0, George Mason University, Fairfax, VA, USA, January 2003
- **B.S. in Health Services Administration,** GPA 3.35/5.0, King Saud University, Kingdom of Saudi Arabia, 1996.

Work Experience

- Nurse Educator \ Nursing Education Department, Academic & Training Affairs, King Fahad Medical City, April 17, 2006 to present.
- Staff Nurse in medical unit King Faisal Specialist Hospital & Research Center, September 2003 to February 2006.
- Ambulatory Care Services Representative, King Faisal Specialist Hospital & Research Center, 1998-2001.
- Medical Supplies Manager at AL Iman General Hospital, Ministry of Health, Saudi Arabia, June 1998 to December 1998.

Professional Achievements

- Certificate of appreciation as a speaker in the symposium of "Nursing Leadership & Management" on January 19, 2004, at the Institute of Health Sciences, Riyadh.
- Appreciation award for contribution to the Customer Service Program as an outstanding Facilitator, given during Celebration of Quality Days, October 11 and 12, 2004, at King Faisal Specialist Hospital & Research Centre
- Certificate of appreciation as a speaker in the symposium of "Education – the route to transforming nursing in Saudi Arabia" on April 20, 2005, at King Fahad Medical City, Riyadh, Saudi Arabia.
- Participated in the College of Nursing's annual research day (March 2009) by submitting a poster which was accepted for presentation entitled "Nurses' perceptions of patient safety culture in Saudi Arabia hospitals."
- Attended the Midwest Nursing Research Society 32rd Annual Research Conference, March 28-31, 2008, in Indianapolis, Indiana.
- Attended the Midwest Nursing Research Society 33rd Annual Research Conference, March 27-30, 2009, in Minneapolis, Minnesota.
- Participated in the Michigan Health & Hospital Association Patient Safety and Quality Symposium by having a poster accepted for presentation entitled "Nurses' perceptions of patient safety culture in Saudi Arabian hospitals", April 14 and 15, 2009, at the Ritz Carlton Hotel in Dearborn, Michigan.