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# Evaluation of an Educational Intervention on Perceptions of a Patient Safety Culture Among Staff in Acute Care Nursing Units

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# EVALUATION OF AN EDUCATIONAL INTERVENTION ON PERCEPTIONS OF A PATIENT SAFETY CULTURE AMONG STAFF IN ACUTECARE NURSING UNITS

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ABSTRACT

**Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units**

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Patient safety has always been a central focus of nursing practice. Current research makes it increasingly clear that what occurs in the surrounding health care environment impacts patient safety. The protracted nursing shortage and nurse turnover may adversely affect patient outcomes and are exacerbated by an environment of disruptive behavior, conflict, and poor communication in the nursing workplace. The Joint Commission has identified these behaviors as key elements that jeopardize the "culture of safety" necessary to assure safe, quality patient outcomes. A culture of safety includes the attributes of teamwork, communication openness, collaboration, and a manager's positive focus on prevention of errors (AHRQ, 2010). There is currently no consensus on the best and practical method of patient safety culture educational interventions for practicing nurses. The purpose of this quasi-experimental, two group pretest/posttest study was to explore the influence of an online educational intervention on nursing staff perceptions of a culture of safety. The study utilized the Department of Defense "Professional Conduct" (2010) online toolkit, and the Hospital Survey on Patient Safety

(HSOPS) to measure changes in nurse perception. The framework for the study is guided by Donabedian's Structure-Process-Outcome (SPO) model. Data were analyzed with independent and paired sample t-tests on the mean total safety scores, as well as repeated measures ANOVA on the mean scores of selected safety dimensions, with within and between groups' variables and exploratory analysis statistics. The final chapter discusses the findings with implications for further research. Recommendations are provided for future research on staff perceptions of their work environment and how to improve that environment. Further research will provide evidence that can help foster continued growth in a culture of safety.

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# CHAPTER 1

Patient safety has always been a central focus of nursing practice. Current research makes it increasingly clear that what occurs in the surrounding health care environment impacts patient safety. The protracted nursing shortage and nurse turnover may adversely affect patient outcomes and are exacerbated by an environment of disruptive behavior, conflict, and poor communication in the nursing workplace. The Joint Commission has identified these behaviors as key elements that jeopardize the "culture of safety" necessary to assure safe, quality patient outcomes.

While most think safety is about preventing errors, a culture of safety "is more than only the absence of incidents" (Reiman, Peitikainen, Oedewald, 2010, p. 1). The Agency for Healthcare Research and Quality has defined a culture of safety as the result of values, attitudes, perceptions, competencies, and patterns of behavior of both individuals and groups that help shape the commitment to, and the style of an organization's health and safety management (ACSNI Report, 1993). In addition, 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 effectiveness of preventive measures (ACNSI Report, 1993). Lastly, a culture of safety includes the attributes of teamwork, communication openness, collaboration, and a manager's positive focus on prevention of errors (AHRQ, 2010).

The relationship between safety educational interventions with nursing staff and the attributes of a culture of safety needs to be studied further. While several studies have assessed a baseline of nursing staff perceptions of a culture of safety, few have focused

on educational interventions with staff. There is also no consensus on the best and most practical method of patient safety culture educational interventions for practicing nurses.

**Background & Significance**

The increased focus upon patient safety began with the release of reports such as the Institute of Medicine (IOM) reports "Medical Errors and the Institute of Medicine" (2001), and "Keeping Patients Safe: Transforming the Work Environment of Nurses" (2003). In 2001, the IOM placed medical error as the main cause of patient deaths between 1996 and 2001, and again in 2003. The primary focus in the IOM report was prevention of medical errors and the fact that conflict in the work environment has a negative impact upon all error prevention plans. These reports focused on the nursing work environment as a major impact on patient safety, which alerted the public and healthcare professionals to the need for a culture of safety healthcare. At that time, the IOM recommended improving patient safety by addressing organizational cultural issues. On the heels of these reports, there was a significant increase in research and publication focused on patient safety.

While the body of patient safety research has increased, it has mainly focused on medical errors and negative outcomes, such as medication errors or intravenous line infections. Relatively few researchers have focused on a culture of safety and the influence of nursing education interventions.

Healthcare quality depends upon patient safety, which relies on high-level competent staff and a culture of safety within staff work environments. The current dynamic and complex healthcare environment, combined with a continuing nursing shortage and nursing staff conflict requires a safer healthcare environment nationwide. Patient safety

and improved work environments are demanded by patients and stakeholders. The importance of this issue continues to be noted in the national news.

### *Nursing Shortage*

National focus on the impending nursing shortage began by the Center for Health Workforce Studies (the Center) at the School of Public Health at the University at Albany, State University of New York under a contract with the Division of Shortage Designation at the Health Resources and Services Administration (HRSA) of the United States Department of Health and Human Services (USDHHS) (Center for Health Workforce Studies, 2007). The United States is projected to have a nursing shortage that will intensify as Baby Boomers age and the need for health care grows. Compounding the problem is the fact that nursing colleges and universities across the country are struggling to expand enrollment levels to meet the rising demand for nursing care (American Association of Colleges of Nursing, 2011).

The Center for Health Workforce Studies (2007) reported that by 2014 it will be necessary to recruit more than 400,000 new registered nurses (RNs) just to replace those RNs older than age 55 who are expected to retire from active nursing practice. In addition, the latest estimates developed by the Bureau of Labor Statistics [BLS, 2006] indicate that the U.S. will require 1.2 million new RNs by 2014 to meet the nursing needs of the country, 500,000 to replace those leaving practice and an additional 700,000 to meet growing demands for nursing services. Buerhaus & Auerbach (2011) reported that the nursing shortage will expand to 260,000 registered nurses by 2020.

In June 2011, Wanted Analytics reported that employers and staffing agencies posted more than 121,000 new job ads for RNs in May, up 46% from May 2010.

About 10% of that growth, or 12,700, were ads placed for positions at general and surgical hospitals, where annual turnover rates for RNs average 14% according to a recent KPMG (Klynveld, Peat, Marwick, & Goerdeler) auditing survey (American Association of Colleges of Nursing, 2011).

Nursing shortage projections increase the concerns about how to best manage the need to attract and retain nurses to ensure a culture of safety and provision of quality care. National organizations have confirmed that a safer social context of the work environment is needed to address the nursing shortage, reduce the loss of nurses due to staffing turnover, and to assure safe patient care (Center for American Nurses, 2006; Institute for Healthcare Improvement, 2009; Institute of Medicine, 2003; Joint Commission, 2008). The nursing shortage is compounded by workplace conflict.

### *Workplace Conflict*

Experts agree that unresolved workplace conflict contributes to occupational stress, poor morale, job dissatisfaction, and staff turnover (Rosenstein, 2009; Johnston, Jones, Charles, McCan, & McKenna, 2012). The following brief review supports this concern. For example, Duddle and Boughton (2007) explored the way nurses relate to and interact with each other in the workplace and factors that influence this, using an explanatory multiple case study design. Thematic analysis was done and a surprising finding was that the nurses had a focus on negative aspects of intraprofessional relationships. The authors had planned to interview staff about "usual" communication, and most staff focused on negative communication. New graduate nurses in particular mentioned difficult interactions at work.

Similarly, Dewitty, Osborne, Friesen, and Rosenkranz (2009) discussed a Conflict Resolution survey conducted by the Center for American Nurses in 2007. Disruptive behavior in the form of lateral violence and bullying in the workplace was reported by most nurses with their supervisor or with other staff. Other studies demonstrated that student nurses also report experiences of bullying in their clinical practice, often due to "professional sabotage and poor nursing role models" (Maben, Latter, & Clark, 2006, p. 470; Magnavita & Heponiemi, 2011; Mamchur & Myrick, 2003). Negative communication patterns are one aspect of a negative work environment involving horizontal or lateral violence which impairs teamwork and compromises patient care (Becher & Visovsky, 2012).

Specific work areas often described as more stressful (such as the ICU and oncology) have also reported nursing conflict (Kelly, 2006; Vivar, 2006). In addition, Cox (2001) studied the effects of unit morale and interpersonal relations on conflict in general nursing units with 141 nurses on 13 inpatient units. In the final model, the unit morale and interpersonal relations dimension of team performance effectiveness was negatively associated with intragroup conflict and anticipated turnover (Cox, 2001).

Other researchers have explored whether leadership skills such as emotional intelligence or certain personality factors assist in managing conflict (Morrison, 2008; Whitworth, 2008). Primary findings were that most nurses have not been taught emotional intelligence (Morrison, 2008), and many use "avoiding" (40%) and "accommodating (59%) behaviors with conflict (Whitworth, 2008, p. 930).

Lastly, Northam (2009) explored nursing conflict and why conflict has become an enormous concern within this profession, and suggested we need to teach nurses skills

surrounding empowered collaborative decision making. Workplace bullying was studied by Cleary, Hunt, and Horsfall (2010) with the primary suggestion of cultivating a positive workplace culture to reduce this behavior. As shown below, workplace conflict has also been a concern that influences staff turnover.

***Staff Turnover***

Several researchers have investigated the risk of turnover among targets of bullying at work with a relationship found between nursing conflict and a higher level of nursing turnover (Hogh, Hoel, & Carneiro, 2011; O'Brien-Pallas, Murphy, Shamian, Li, & Hayes, 2010; Simon, Muller, & Hasselhorn, 2010). Parry (2008) examined the relationship between intention to change profession and intention to change employer among newly graduated nurses, and found a relationship between affective commitment, job satisfaction, and intent to leave the profession in their first year of practice (Parry, 2008, p. 161). Another recent study found that perceived stress was proposed to be linked to job satisfaction and turnover intention, and significant findings confirmed this relationship ($r = 0.55$, $P = .00$; $r = 0.34$, $P = .00$, respectively), and job satisfaction was significantly related, positively, to turnover intention ($r = 0.74$, $P = .00$) (Applebaum et al., 2010, p. 326).

Flinkman, Leino-Kilpi, and Salantera (2010) conducted an integrative review of empirical research on nurses' intention to leave the profession. Of the 31 studies reviewed, there were pronounced differences between countries in intention to leave, and "being young" or having "high level of skills" were associated with greater intention to leave the profession in several studies (Flinkman, Leino-Kilpi, & Salantera, 2010, p. 1428).

Staff turnover not only impacts the day to day shift needs and patient care, but also healthcare organization bottom lines. The overall complexity and rapid pace of care in many nursing care areas contributes to staff stress, which has consequences such as physical, psychological, and social fallout on nurses in these high conflict areas. This increases the turnover of staff and the use of sick time, which then impacts not only care but the organization's profit margin. The impact of conflict, staff stress, and effect on bottom lines will be discussed further in the chapter 2 literature review.

It is clear that we are facing a nursing shortage, and that nurses have reported a stressful work environment and workplace conflict that is reported to influence nursing staff turnover. Each of these issues has serious implications for practice, an organization's bottom line, and how to best integrate a culture of safety into nursing practice. Nurses provide care to patients in hospitals 24 hours each day, and their patients expect them to provide safe and compassionate care during those 24 hours. An absence of a culture of safety in a hospital unit usually means the care is affected by behavior that is not as safe or compassionate as the patient expects. A culture of safety promotes excellent nursing care and means that patients can expect to receive safe and accurate care.

**Problem Statement**

As of January 2009, all accredited hospital nursing units were mandated to implement the components of a culture of safety (Joint Commission, 2008). The mandate addresses the healthcare work environment that is too often characterized as chaotic with inadequate or inappropriate communication and conflict that hinders the culture of safety initiatives. Although the new Joint Commission mandate has been in effect for four

years, there is a lack of research related to the influence of a culture of safety educational interventions among nursing staff. Sorra and Nieva (2004) stated that "healthcare systems must move away from the current 'blame and shame' culture that prevents acknowledgement and obstructs any possibility of learning from error" (p. 17). Therefore, today's nursing scholars are challenged to assess nursing's perspectives on a culture of safety that can prevent adverse events and harm to patients. A culture of safety must be encouraged that changes the social context from an untrusting blame approach to a trusting approach that encourages healthcare staff to share information about safety issues and what can be done to promote a safer healthcare environment.

Nursing practice faces many challenges related to conflict in the work environment and integration of a culture of safety. The literature has shown that issues such as lack of clear communication, lack of evidence of teamwork and collaboration, inadequate management of patient care errors, lack of mutual trust among health care workers and conflict contribute to nurses' job dissatisfaction and feeling overstressed. Ultimately, this, affects their ability to provide safe, quality, and humane care. In addition, the nursing shortage is no secret to stakeholders and has become a larger concern in the past decade, causing hospital administrators and nurse leaders to become more conscious of the quality and safety of the staff work environment and its impact on the workforce. Understanding nurses' perceptions on the current work environment and patient safety is critical in the current healthcare environment, not only for endurance of healthcare agencies, but also in prevention of workplace conflict and bullying, increasing staff retention, and the provision of exceptional and appropriate patient care.

Research into conflict in the workplace environment, as well as rich descriptions of how such conflict is occurring has provided an understanding of the seriousness of the problems in the workplace. However, there is a lack of research upon the influence of an educational intervention on staff perceptions of a culture of safety and their knowledge of safety measures in their own acute care hospital setting. Therefore, research is needed to understand how nursing staff perceive the current work environment as it relates to a culture of safety in clinical practice as well as the efficacy of planned educational interventions.

**Purpose of Study**

The purpose of this study was to explore the influence of an educational intervention on nursing staff perceptions of a culture of safety. In addition, this study would add to our understanding of the efficacy and value of using the Department of Defense "Professional Conduct" (2010) online toolkit as an educational intervention in influencing nurses' perceptions of safety, and promoting safe patient care.

This study has three main objectives: (1) To explore staff nurses' perceptions of a culture of safety in one hospital in the southwest, at two times, with a culture of safety educational intervention done with a randomly assigned convenience sample intervention group, and subsequently with the control group; (2) To compare the difference between the total culture of safety score before and after an educational intervention in both groups, and how these scores compare to the AHRQ benchmark of 61%; (3) To explore the variation in select safety dimensions (such as teamwork, communication, and staffing) between the intervention and control group at Time 1 and Time 2.

**Research Questions**

1. How do the total safety culture scores vary in the intervention group and control group between Time 1 and Time 2?
2. How do the total safety culture scores with the intervention group and control group at Time 1 and Time 2 compare to the AHRQ benchmark of 61%?
3. How do the scores on select safety dimensions vary in the intervention and control groups between Time 1 and Time 2?

# CHAPTER 2

## REVIEW OF RELATED LITERATURE

This chapter provides a comprehensive review of the literature related to a culture of safety. Culture of safety will be defined and any available models or constructs of a culture of safety discussed. Instruments measuring professional staff culture of safety perceptions will be detailed as well as studies of educational interventions conducted that were intended to enhance nursing staff or medical staff competency of a culture of safety in healthcare practice. In addition, this chapter is organized by the concepts that are applicable to a culture of safety and the nursing work environment, including the significant concepts of teamwork and collaboration, communication, nurse staffing, and conflict. The second half of the chapter reviews descriptive studies conducted with the HSOPS instrument, and educational interventional studies, as well as critique of the pros and cons of interventions used.

Initial systematic procedures were utilized in an attempt to locate a representative sample of relevant literature on the "culture of safety." While it is clear that the term "culture of safety" is not solely owned by the nursing or medical professions, literature was limited to samples from healthcare studies. Given that the Joint Commission released their guidelines on a culture of safety in 2008 to be implemented in 2009, and "safety" has been a buzzword in healthcare since the mid-2000s, the search was limited to human subjects' studies published from 2005 to 2012, to explore studies since Joint Commission requirements began. Databases searched were Academic Search Premier (through EBSCO Host), SCOPUS, and the Cumulative Index of Nursing and Allied Health Literature (CINAHL). In addition to safety study searches, the search included

"nursing conflict" and "horizontal violence" AND "nursing" terms via CINAHL and Academic Search Premier, as poor staff communication has been a vital issue in the Joint Commission reports on patient safety. This search included the years 2003 to 2012 to include studies prior to current Joint Commission patient safety reports.

In addition, the literature review included related reports and research publications from agencies or organizations focusing on patient safety or the nursing work environment. These organizations include the Institute of Medicine, the AHRQ, and other related organizations.

The next section defines a "culture of safety" as well as similar terms provided by the Quality of Safety Education for Nursing (QSEN, 2010) to support the concepts focused upon in the literature review and in the current study plans.

**Culture of Safety**

There is not yet firm agreement regarding the use of terms to best describe the culture of safety in healthcare studies. While safety "culture" and "climate" are interlinked concepts, and the terms are often used interchangeably, there is ongoing debate about their differences and similarities (Hartmann et al., 2009). Culture is the underlying, pervasive, and relatively more stable set of assumptions and values that guide beliefs and behavior in an organization (Antonsen, 2009). Climate refers to the more malleable perceptions of an organization's members about predominant beliefs and behaviors that are expected, supported, and/or rewarded with regard to a specific domain of organizational life (Sexton et al., 2011).

The theory and practice of safety climate measurement originated in high-reliability organizations, which are typically found in the aviation, nuclear energy and offshore oil-

drilling industries, among others. Safety *culture* has been defined as "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" (Nieva & Sorra, 2003, p. ii18). In a safe culture, employees are guided by an organization wide commitment to safety, in which each member upholds their own safety norms and those of their coworkers (Zohar et al., 2007). This is further defined as an atmosphere of mutual trust in which all staff members can talk freely about safety problems and how to solve them, without fear of blame or punishment, as well as initiatives to positively manage the work environment (Joint Commission, 2008).

**Quality and Safety Education for Nurses (QSEN)**

The conceptual constructs underpinning this study includes the constructs of patient safety and teamwork and collaboration, as conceptually defined by the Quality and Safety Education for Nurses program (2010). The overall goal for the Quality and Safety Education for Nurses (QSEN) project is to meet the challenge of preparing future nurses who will have the knowledge, skills and attitudes (KSAs) necessary to continuously improve the quality and safety of the healthcare systems within which they work (2010).

The QSEN overall definition of safety is that it minimizes risk of harm to patients and providers through both system effectiveness and individual performance. The selected skills from within the KSAs a graduate nurse must use within a safety practice include: 1) participate as a team member to design, promote and model effective use of technology and standardized practices that support safety and quality; 2) participate as a team member to design, promote and model effective use of strategies to reduce risk of harm to

self and others; and, 3) promote a practice culture conducive to highly reliable processes built on human factors research.

Teamwork and collaboration is defined by QSEN as the ability to function effectively within nursing and inter-professional teams, fostering open communication, mutual respect, and shared decision-making to achieve quality patient care. The selected skills from within the KSAs in teamwork and collaboration include the following: 1) demonstrate awareness of own strengths and limitations as a team member; 2) continuously plan for improvement in use of self in effective team development and functioning; 3) act with integrity, consistency and respect for differing views; 4) communicate with team members; and, 5) adapt own style of communicating to needs of the team and situation.

The next section reviews the nursing work environment by focusing upon nurse staffing and staff communication issues which influence the work context and culture.

**Work Environment & Culture**

This section on the work environment and culture includes studies regarding the context of nursing work areas, which includes: the nursing shortage, teamwork and collaboration, communication, conflict, horizontal violence, and a sense of blame. The review of literature has focused upon information concerning nursing practice, horizontal violence, and patient safety, teamwork and safety, and pre and post-intervention studies in patient safety.

The mention of conflict between nurses working as a team may bring up visions of the notorious "*Mean Girls*" movie adored by teenagers in 2004 (Guinier, Messick, Michaels, Rosner, Shimkin & Waters). Mean girls are known to violate team dynamics

which results in stress, fear, and peers' lack of perceptions of safety in their daily life. However, it is not only the A-list girl cliques who are demonstrating violent team behavior. As most nurses understand, conflict is seen as an inevitable part of life and occurs in all work settings. In the healthcare environment, conflict can occur at many levels with its inherent hierarchical structure, time and economic constraints and patient care and safety concerns (Center for American Nurses, 2007).

Multiple recent studies have focused upon nursing staff behavior and conflict or horizontal violence (HV) in the workplace (Kotzer & Arrellana, 2008; Pauly, Varcoe, Storch, & Newton, 2009; Rice, Rady, Hamrick, Verheijde, & Pendergast, 2008). Inadequate communication, intraprofessional oppression, and lack of collaboration and conflict resolution continue to disempower nurses and hinder improvement of workforce conditions (Latham, Hogan, & Ringl, 2008).

The range of behaviors that nurses have described in the literature as HV include "antagonistic" behaviors we would expect from the "*Mean Girls"* such as: rolling of the eyes, gossiping, unnecessary criticism, innuendo comments, scapegoating, passive aggression, lack of inclusion in lunch or events, and bullying (Almost, 2006; Hinchberger, 2009; Weinand, 2010). This range of behavior is included to assist in understanding the background issues in the review of the work environment.

In 2006, Almost noted that in nursing work environments conflict was becoming "a significant issue resulting in job dissatisfaction, absenteeism, and turnover" (p. 444). Brinkert (2010) agreed that conflict is pervasive in nursing and has many costs, including burnout, higher absenteeism and higher turnover. Smith (2011) presents a case of

breaking the cycle of horizontal violence in nursing aiming her discussion at interpersonal skills for nursing students who practice in current nursing areas.

In an era where focus on productivity is high, resources are scarce, outcomes are measured, and patients are more demanding both clinically and as consumers, the risk for growth in negativity is apparent (Weinand, 2010). She contends that the consequences of workplace sabotage and horizontal violence are immense with profound effects on employees, productivity, patient safety, organizational stability, and professionalism. Low employee morale and high employee turnover are major consequences of horizontal violence (Weinand, 2010). The further consequences of staffing issues are the impact on agencies bottom lines, which is discussed in the safety issues area.

The next section reviews eight recent studies concerning the nursing work environment, particularly staff perceptions of satisfaction, empowerment, or moral distress and conflict or HV in the work environment.

**Staffing Impact on an Organization's Bottom Line**

A literature review of conflict and its costs conducted by Brinkert (2010) reported that many studies cited absenteeism and lower efficiency, which both contribute to the bottom line of hospital costs. As expected, conflict has many costs, both for the staff experiencing the conflict and the hospitals facing the cost of lack of staff. As shown in the outcome literature review, patients also are impacted by conflict and lack of staff.

Research also shows that effective nurse staffing can significantly reduce the risk of adverse events and improve quality of care. The continuing healthcare workforce shortage has been putting increased pressure on organizations financial levels that also are facing federal and state budget issues (Kulma & Springer, 2006). High vacancy and

turnover rates also impact the resources (using travelers and other nurses) for core staffing needs and also impact the requirements for extra staff for exceptional needs such as a high level of patient census.

Evidence suggests that quality, cost of care, safety, length of stay, readmission rates, patient, physician and staff satisfaction, and turnover and vacancy rates have an impact on operational and financial performance and are linked to staffing (Douglas, 2008). According to recent studies, efficient staffing levels and the right mix of skill and training can reduce the risk of adverse events (Needleham, Buerhaus, et al., 2006; Aiken et al., 2010).

While three recent studies focused on surveys regarding the work environment and staff satisfaction, five studies focused primarily on psychological violent behavior in the work area. All three work environment studies involved surveys mailed out to nurses, with the samples as small as 300 and as large as 1,508. Significant findings include: overall empowerment was positively related to overall Magnet hospital characteristics ($r$ = 0.72; $P$ = .0001), while patient safety climate scores were moderate ($M$ = 3.59, SD = 0.72) (Armstrong, Laschinger, & Wong, 2009), a model of various work attitudes explained 54% of the variance in work satisfaction (Kovner, Brewer, Wu, Cheng, & Suzuki, 2006), and recent graduates (less than 5 years) indicated a need for more management/leadership as part of their educational preparation (Bowles & Candela, 2008).

Limitations of these studies include operationalizing concepts by surveys that do not provide the study constructs (Armstrong et al., 2009), a low response rate and sample from only one state (Bowles & Candela, 2008), and that few hospitals are able to apply

for the Magnet level in the Armstrong et al. (2009) study (such as professional staff levels, education on safety programs, and high level staff survey findings for multiple years).

The samples in the studies on horizontal violence ranged from 126 nursing students to 551 new graduates and from 198 to 476 working nursing staff. Significant findings from the five studies include finding a tool appropriate for further study of workplace violent behavior perceptions (Dilek & Aytolan, 2008), that covert interpersonal conflict was common, with more than 50% of the sample reported being undervalued by other nurses, and 188 experiencing statements that were rude, abusive, humiliating, or involved unjust criticism (McKenna, Smith, Poole, & Coverdale, 2003). Nurses over 34 years of age found futile care distressing and employment greater than 3 years was related to moral distress with physician practice and deception (Rice, Rady, Hamrick, Verheijde, & Pendergast, 2008), 28% of surveyed staff had been the target of violence in the past year, 22 (11% of the total and 39% of those experiencing violence) reported being injured from that violence, and 114 (58%) reported being the target of verbal aggression" (Spector, Coulter, Stockwell, & Matz, 2007, p. 123). Lastly, 100% of nursing student subjects had experienced some type of workplace violence with 50% of this from staff nurses, 69% as verbal abuse and 21% as bullying (Hinchberger, 2009, pp. 42-43).

The primary limitations in the HV studies include lack of understanding circumstances surrounding HV and the imprecise nature of assessment of HV (McKenna et al., 2003), use of a tool primarily intended for non-healthcare employees with nursing students (Hinchberger, 2009), and generalization from small sample sizes.

**Nurse Staffing and Patient Outcomes**

The next five studies add to our understanding of the importance of staff satisfaction, by focusing on nurse staffing and nurse turnover and its impact upon patient outcomes. This section includes research studies as well as integrative literature reviews.

Two recent studies explored the relationship between nursing unit communication and patient safety and quality outcomes (Effken et al., 2011; Unruh & Zhang, 2012). While Effken et al. (2011) noted communication patterns were correlated with falls and medication errors, Unruh and Zhang (2012) found that patient safety indicators (PSIs) were negatively and significantly related to RN staffing measures.

Limitations of these two studies include generalization due to sample size and homogeneity of the sample, and that ORA was not defined until the authors mentioned the instrument used (organizational network analysis), which made it difficult to follow their study design (Effken et al., 2011), and the use of large hospital-level data sets to establish links between unit-level or hospital-level nurse staffing and patient outcomes (Unruh & Zhang, 2012).

Three recent studies on the impact of nursing turnover or work conditions on patient outcomes involved secondary analysis or integrative literature reviews (Bae, Mark, & Fried, 2010; Bae, 2011; Ridley, 2008). Bae et al. (2010) found that nursing units with moderate levels of turnover were more likely to have lower levels of workgroup learning (continuous quality improvement) compared those with no turnover ($p < .01$), and that workgroup cohesion and relational coordination had a positive impact on patient satisfaction ($p < .01$) and increased workgroup learning led to fewer occurrences of severe medication errors ($p < .05$) (p. 40).

Bae (2011) found in the 11 studies she reviewed (spanning 2000 to 2009) that increased attention has been drawn to nurse working conditions resulting from nursing shortages, while Ridley (2008) found that while the majority of studies found no significant association between either the RN skill mix or RN dose and inpatient mortality, 30-day mortality was consistently found to have a significant inverse relationship with RN skill mix or RN dose from studies published between 1992 to 2005.

Limitations of these studies included the length of time necessary for turnover data (Bae et al., 2010), the variation in outcomes measured in studies and difficulty using search terms on work conditions and outcomes (Bae, 2011), and lastly, difficulty finding a relationship between nursing education levels and patient safety (Ridley, 2008).

***Summary of Literature on the Work Environment***

The literature reviewed regarding nursing conflict and the work environment topics were nine descriptive studies, and four secondary analyses of literature. For the primary studies, the sample sizes ranged from 153 to 1,508, and from single sites to multiple states. The research findings as well as the secondary analysis outcomes provided updates of nursing satisfaction and communication or conflict, and the impact of these issues on patient safety or care outcomes.

Negative staff behavior is not new, but has reached a level requiring discussion by other healthcare leadership organizations. The Education Planning Commission for the LEAD Summit held in 2007 in Texas, provided educational sessions targeting strategies to address conflict productively in the nursing workforce and healthcare (Center for American Nurses, 2006). The Institute of Medicine (IOM) report *Keeping Patients Safe*, also stressed the need for effective communication and conflict management skills to

assure a safe work environment (2003). The primary focus in the IOM report was prevention of medical errors and the fact that conflict in the work environment has a negative impact upon all error prevention plans. A key IOM recommendation includes hospitals conducting an annual, confidential survey of nursing and other health care workers to assess the extent to which a culture of safety exists. Disruptive staff behavior undermines the emerging patient safety initiatives, causing healthcare organizations and the industry as a whole to re-examine their long-standing tolerance of broadly disruptive behaviors affecting clarity of communication and teamwork.

In July of 2008, the Joint Commission wrote a policy statement essentially specifying the appropriate way to behave, in this case, adult nurses. This Sentinel Event Alert (2008) was titled "Behaviors that undermine a culture of safety." According to the Joint Commission (2008) nursing team dynamics that lead to conflict and negatively impact patient safety will no longer be tolerated and may result in financial sanctions upon a hospital showing evidence of such behaviors.

Recognizing that poor workplace environments affect safety and care outcomes, the Joint Commission required all accredited hospital nursing units as of January 2009 to implement the components of a culture of safety (Joint Commission, 2008). To address the culture of safety, two new Joint Commission leadership elements of performance (EP) standards went into effect January 1, 2009 that address disruptive and inappropriate behaviors in all accreditation programs. These two standards included: EP 4: The hospital/organization has a code of conduct that defines acceptable and disruptive and inappropriate behaviors, and EP 5: Leaders create and implement a process for managing disruptive and inappropriate behaviors (Joint Commission, 2008). In addition to the 2009

mandates, the 2010 and 2011 National Patient Safety Goals for Hospitals each included a patient safety goal that calls upon hospital staff to "improve the effectiveness of communication among caregivers" (Joint Commission).

To reach the components of the Joint Commission patient safety goals, hospitals must assess the work environment for the culture of safety. As will be discussed next, various instruments have become available to assess hospital areas regarding a culture of safety.

**Culture of Safety Instruments**

During the extensive culture of safety literature review, it became apparent that questionnaire surveys remain the dominant method for assessing staff perceptions of safety culture, safety climate, or a culture of safety. This section of the paper briefly reviews five (5) surveys used predominantly in studies with acute care staff.

**Hospital Survey on Patient Safety (HSOPS)**

The HSOPS, developed by Sorra and Nieva (2004), has remained the primary instrument used for studies in acute care hospitals regarding their current "culture of safety" level (AHRQ, 2008). The instrument has been used in hundreds of hospitals since its first availability in 2004, and is available free of charge. There are 42 items on this instrument, with 12 dimensions of safety, and one open-ended question. The seven unit-level dimensions include: (1) supervisor/manager expectations and actions promoting safety, (2) organizational learning—continuous improvement, (3) teamwork within units, (4) communication openness, (5) feedback and communication about error, (6) non-punitive response to error, and (7) staffing. Three hospital-level aspects of safety are measured by (1) hospital management support for safety, (2) teamwork across hospital units, and, (3) hospital handoffs and transitions. The four outcome variables

include: (1) overall perceptions of safety, (2) frequency of event reporting, (3) patient safety grade (of the hospital unit), and, (4) number of events reported (Sorra & Nieva, 2004). The final open-ended question allows narrative comments to be added.

On this instrument, Sorra and Nieva (2004) stated that all dimensions were shown to have acceptable levels of reliability (defined as Cronbach's alpha equal to or greater than .60), with reliability coefficients ranging from .63 to .84. Reliability refers to the consistency of an instrument's ability to measure an attribute. It can be measured by three estimates: stability, internal consistency, and equivalence (Polit & Beck, 2008). Sorra & Nieva (2004) stated that the correlations between the safety culture composites or scales ranged from .23 (between Non-Punitive Response to Error and Staffing or Frequency of Event Reporting) to .60 (between Hospital Management Support for Patient Safety and Overall Perceptions of Safety).

More recently, Sorra and Dyer (2010) reported on the psychometric properties of the AHRQ HSOPS with a dataset of 331 hospitals, 2,267 units, and 50,513 hospital staff respondents. Within this dataset, 58% used paper forms, 23% used the web survey form, and 19% used both paper and web format (Sorra & Dyer, 2010). Multiple analysis methods the researchers used, such as confirmatory factor analysis and similar tests, showed that the survey dimensions are reliable and assess patient safety culture.

**Patient Safety Climate in Health Care Organizations (PSCHO)**

This instrument is used to measure staff perceptions of their "safety climate." The PSCHO instrument contains 42 five-point neutral mid-point, Likert-type response scale items (strongly disagree, to strongly agree) related to safety climate, plus six demographic items. "The PSCHO instrument is scored to highlight conditions

antithetical to safety by computing the fraction of questions answered indicating an absence of safety climate—the percentage of *problematic response*" (Hartmann et al., 2009, p. 326). Thus, a lower percentage of problematic responses on the PSCHO survey indicates the perception of a higher level of safety climate and emphasizes identification of weaknesses in safety climate that represent opportunities for improvement. Validity and reliability of the PSCHO have been established in the Veteran's Administration healthcare system (Hartmann et al., 2009, p. 325).

### Safety Attitudes Questionnaire (SAQ)

The Safety Attitudes Questionnaire (SAQ) is a modification of the Intensive Care Unit Management Attitudes Questionnaire, which was derived from a questionnaire broadly used in commercial aviation, the Flight Management Attitudes Questionnaire (FMAQ) (Sexton et al., 2006). The SAQ is a validated instrument used to measure six safety related domains regarding attitudes and perceptions in healthcare (Sexton et al., 2006). The six factor domains are: Teamwork Climate, Safety Climate, Perceptions of Management, Job Satisfaction, Working Conditions, and Stress Recognition. The SAQ is a single page (double sided) questionnaire with 60 items and demographics information (age, sex, experience, and nationality) (Sexton et al., 2006) and takes approximately 10 to 15 minutes to complete. Each of the 60 items is answered using a five-point Likert-type scale (Disagree Strongly, Disagree Slightly, Neutral, Agree Slightly, Agree Strongly), and some items are negatively worded. There is an open-ended section for comments: "What are your top three recommendations for improving patient safety in this clinical area?"

Composite scale reliability for the SAQ has been assessed via Raykov's ρ coefficient. The ρ value for the SAQ scale reliability level in one reported sample was .90, indicating strong reliability of the SAQ (Sexton et al., 2006). The survey has been adapted for use in multiple care areas, including ICUs, operative areas, and acute care areas.

**Safety Climate Scale (SCS)**

The safety climate scale originated in the aviation industry where it was used for flight staff perceptions of status hierarchies, leadership styles, stress, and interpersonal skills, and has been adapted for use in many medical areas (Pronovost et al., 2005). This 10-item survey is answered using a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree) and assesses the extent to which staff perceive a strong and proactive organizational commitment to patient safety. The 10 items in this survey are statements that measure leadership initiatives, such as "leadership is driving us to be a safety-cultured institution" (Pronovost et al., 2005, p. 37). None of the statements surround personal perceptions regarding teamwork, communication, or staffing. "Scales and individual items from the SCS surveys have demonstrated good reliability and internal consistency" (Sexton et al., 2006, p. 6).

**Nursing Climate Scale (NCS)**

The NCS is a two-part scale referring to hospital- and unit-level climates. Hospital nursing climate includes "20 items with a 5-point rating scale (completely agree to completely disagree)" (Zohar et al., 2007, p. 1313). The items identify policies and practices indicative of the senior nursing managers' commitment to the three caring dimensions (Zohar et al., 2007). The three caring dimensions are not defined in the study but alluded to prior to the first time mentioned as "the key dimensions of the nursing role

(i.e., patient orientation, professional development, and teamwork)" (Zohar et al., 2007, p. 1313).

Unit nursing climate includes 30 items accompanied by the same 5-point rating scale, and items for this scale were developed in parallel to its companion, following the same procedure. The items identify unit-level practices of the nurse manager and professional peers concerning the same three caring dimensions. A recent study tested measurement reliability by comparing the stability of successive samples, using pairwise correlation with (Rs =.85) (Zohar et al., 2007).

***Summary of Culture of Safety Instruments***

In summary, a few instruments have been prepared for measuring staff perceptions of a culture of safety and related safety concepts, while other instruments focus more on measuring leadership initiatives surrounding patient safety. In addition, some of the current safety culture instruments were adapted from non-healthcare areas, such as aviation. While nursing staff have been studied with several different types of culture of safety instruments, as noted above, some tools only address one component of staff's concerns regarding safety, such as teamwork culture or the manager's communication style. Other instruments focus on a limited number of dimensions or were designed for use with one specific population, such as the ICU. Furthermore, many instruments have not been described by the authors with clear reliability or validity. Specific limitations concerning the individual instruments are discussed next.

With the PSCHO survey literature it is not apparent how a lack of "problematic responses" demonstrates a higher level of safety. As research authors have mentioned in recent safety studies (please see this chapter's literature review area), some cultural

groups do not feel comfortable mentioning problems at work verbally or even on a survey. Therefore, their survey answers may demonstrate fewer problematic responses.

A limitation of the SAQ is the fact that the survey requires adaptation before it can be used in non-intensive care units, and the fact it was changed from aviation research use into ICU use first. Also, the 60 items may fatigue staff or have them hurrying to answer the questions if given a hard copy survey to complete at work (which is usually done per current publications).

As compared to the other safety culture instruments, the SCS with only 10 items seems too brief to measure perceptions of safety. Also, this survey does not include dimensions regarding teamwork, communication, and staffing concerns that are clearly used in the HSOPS, and partially used in the SAQ.

Similarly to the SCS, a limitation of the NCS survey is that is does not measure teamwork, communication, staffing, or similar dimensions which are current acute care staff concerns. In addition, the caring dimensions used by the researchers were not clearly defined, which affects comparative analysis with further studies.

Due to limitations of the four instruments reviewed along with the HSOPS survey, the HSOPS instrument will be used by this researcher, particularly because of the domains measured by this survey. Selecting the HSOPS was done after careful review of other instruments.

In a review of nine safety climate surveys, Colla, Bracken, Kinney, and Weeks (2005) found that they varied considerably with regard to general characteristics, dimensions covered, psychometrics performed, and uses in studies. The authors contended that achievement of a culture conducive to patient safety may be an “admirable goal in its

own right, but more effort should be expended on understanding the relationship between measures of patient safety climate and patient outcomes" (Colla et al., 2005, p. 365).

Due to the variation in surveys, the Agency for Healthcare Research and Quality (AHRQ) sanctioned the HSOPS instrument after development and extensive use in 2004, to allow hospitals to use the survey and compare findings to others who have used the survey with healthcare staff. A comparative database is funded by the AHRQ and hospitals voluntarily submit their HSOPS findings at the AHRQ website. Therefore, this survey was selected due to its continued use in U. S. hospitals, and documented reliability and validity, and to add to our knowledge of staff perceptions.

The following literature review section first examines five (5) research studies conducted with the HSOPS instrument, and then seven (7) studies that used the other safety surveys or a non-defined survey (not mentioned in the research article). Lastly, the literature review examines11 educational intervention studies on a culture of safety, to provide a review of where the profession is at this time with staff safety education interventions.

**Research on a Culture of Safety**

Studies on a culture of safety have utilized various instruments, as indicated above. This section reviews literature regarding the use of the HSOPS survey in non-interventional studies, as well as studies conducted with other safety instruments. Of the non-interventional studies utilizing the HSOPS, several were from large sample sizes (larger than 300), and a few from samples of less than 200 subjects. Given that the following studies used the HSOPS, findings regarding teamwork, communication, and staffing will be included if mentioned within the studies.

Two small-scale studies were conducted in a single hospital, with one site focused entirely on nursing staff (Halbesleben et al., 2008), and one small-scale study surveyed nurse and physicians in a perioperative area (N=83) (Scherer & Fitzpatrick, 2008), while three surveyed both nurse and physicians in large-scale designs (Bodur & Feliz, 2010; El-Jardali, Dimassi, Jamal, Jaafar, & Hernadeh, 2011).

The two small-scale studies found that a mean of 2.56 for the overall patient safety grade was given by the nursing staff, while the authors did not report other domains, such as teamwork across units (Halbesleben et al., 2008), and an independent t-test sample found that nurses reported a higher perception of safety and communication than did the physicians, with "Teamwork within units" at 75%, "Communication openness" at 68%, and "staffing" at 56% (Scherer & Fitzpatrick, 2008, p. 169). Limitations of these studies include limiting convenience samples to one hospital and one area (perioperative, for example).

The three large-scale studies primarily found an overall patient safety score of 44%, considerably lower than the average AHRQ benchmark score of 61%, and "teamwork within units" at 62%, and "staffing" at 44% (Bodur & Feliz, 2010), "teamwork across units" at 94%, "communication openness" at 58% and "staffing" at 39% (Chen & Li, 2010), and overall perceptions of safety were 3.80 for nurses, and 3.69 for physicians, and 80% of the nurses rated "staffing" at the lowest level and "teamwork within units" at the highest level (El-Jardali et al., 2011).

Limitations of these studies included authors' concerns regarding bias when staff use self-report instruments (Bodur & Feliz, 2010; El-Jardali et al., 2011), and cultural

hesitancy in discussing adverse events and errors (Chen & Li, 2010). In addition, the lack of similar reporting of the instrument dimensions impacts comparison.

### *Summary of Research with HSOPS Instrument*

The five studies conducted with the HSOPS instrument from 2008 to 2011 ranged from 83 subjects in one OR site and 148 staff in one hospital, to 6,807 in 68 different hospitals in Lebanon. Each of the studies were entirely descriptive in nature. The descriptive studies conducted with the HSOPS instrument provide a baseline of staff perceptions in various countries and work areas. For those reporting findings of "teamwork" and "staffing" dimensions, teamwork consistently received a high score while staffing consistently received the lowest score. These findings support the current research regarding staffing issues in the nursing work environment, and the importance of teamwork within nursing work areas.

### Non-interventional Studies with other Safety Instruments

Several recent hospital-based studies have used other safety survey instruments with no intervention conducted. In these surveys, the domains are different than the 12 main HSOPS survey domains, and cover several types of safety areas. The significant findings of their safety topics are discussed in the reviews, as are study limitations.

Three recent studies used an unnamed instrument with small groups of nursing staff (Benn et al., 2009; Holman, Ellison, Maghsoodloo, & Thomas, 2010); and leadership/management staff (Ginsburg et al., 2010). Significant findings included scores had moved from zero with 41 participants from 24 acute hospitals (Benn et al., 2009), Alabama nurses listed bathroom transfers as the most difficult (Holman et al., 2010), and in Ontario, Canada, managers felt that informal safety champions exist but are only

somewhat influential at driving patient safety (mean = 2.34) (Ginsburg et al., 2010). Limitations of these studies with unnamed surveys include limited sample sizes, self-selected samples, and informal leaders who may have influenced study outcomes, such as in the Ginsburg et al. (2010) study.

Two recent studies used the SAQ to survey large samples (greater than 1,500) (France et al., 2010; Patterson et al., 2010). France et al. (2010) found that "teamwork climate: was 72% positive across the ICUs they studied, while "working conditions" were 59%, while Patterson et al. (2010) noted wide variation in scores across EMS agencies, for example, safety climate of 74.5% (min 49.9, max 89.7) and Teamwork climate of 71.2% (min 45.1, max 90.1), and with air medical EMS agencies demonstrating higher scores across all domains. Limitations of the SAQ studies include sample sizes and influence on positive responses, and the large number of emergency agencies (61) and lack of social context descriptions of these agencies in the Patterson et al. (2010) study.

The final two studies used more uncommon surveys with patient safety topics, including the Organization and Management Survey (OMS) in the nursing home setting (Scott-Cawiezell et al., 2006), and the Nursing Climate Scale (NCS) in 69 inpatient units (Zohar, Livne, Tenne-Gazit, Admi, & Donchin, 2007). The OMS findings showed that nurses primarily reported a sense of blame if they reported errors, while the NCS findings noted that the best or worst safety is obtained when the unit and hospital climates are aligned and that positive unit climate can compensate for the detrimental effect of poor hospital climate (Zohar et al., 2007). Limitations of these two studies include the staff verbal comments regarding problems with their leaders that were not carefully checked or

confirmed by the researchers in the OMS study, and more hospital level results needed to report hospital outcomes in the NCS survey study.

***Summary of Literature on a Culture of Safety***

These seven descriptive studies range widely in the sample sizes (subject sizes and site areas) and the study purposes. Two of the seven conducted a one-time survey during safety program interventions, while the other five did not mention any new interventions or safety programs in progress during their studies. A limitation of these studies is that only four studies labeled the survey used (SAQ, OMS, and NCS studies) while the other three describe the tool's question format but did not name the instrument used. This impacts the method to compare study methods and findings. It is also interesting to note that Benn et al. (2009) did not conduct a quasi-experimental study with their "Safer Patients" program, to assess the outcome of that program.

**Research on Educational Interventions for a Culture of Safety with Healthcare Staff**

Eleven recent interventional studies on a culture of safety were found and are discussed next in group summaries by the type of instruments utilized. Four studies used the HSOPS survey in long-term (1-3 years), large-scale (520-4000 staff), with extensive interventions, and one included extensive interventions with a small sample of less than 50 staff (Mayer, Cluff, Lin, Schade-Willis, Stafford, Williams, et al., 2011). Significant findings of these four studies included a "teamwork within units" mean score of 76% pre-intervention and 77% post-intervention (Adams-Pizarro, Walker, Robinson, Kelly, & Toth, 2008), pre and post implementation of an SBAR tool with Canadian Rehab staff with one year between surveys demonstrated clinical meaningful change (= or > 5%) in

all 12 safety dimensions of the HSOPS (Andreoli et al., 2010), a project to improve unit-based safety culture through implementation of a multidisciplinary teamwork and communication intervention with one year between the surveys (454 staff pre, and 368 staff post-intervention), showed five of the 12 subscales improved, with nurses perceiving stronger safety culture than physicians or pharmacists (Blegen et al., 2010), and lastly, significant improvement in median values for overall perceptions of safety (4.63) with 2009 better than 2006 or 2008, $p < .01$ (Mayer et al., 2011).

Multiple limitations surround these complex intervention studies, including lack of control over the survey distribution process in 14 hospitals and lengthy time span (Adams-Pizarro et al., 2008), the context of a range of patient safety initiatives at Toronto Rehab (Andreoli et al., 2010), and lack of control groups and multiple and divergent types of interventions in all of the studies. In the Meyer at al. (2011) study, the HSOPS was one of three surveys used, and the multiple survey burden may influence the findings.

Several recent safety studies used other safety surveys with interventional approaches. Of the three studies that used the SAQ survey, two were large-scale designs (Sexton et al., 2011; Haynes et al., 2011), while one had less than 30 staff at each point in time (Timmel et al., 2010). Significant findings of these studies included a pre-interventional mean SAQ score of 3.91 (on a scale of 1 to 5) with 281 subjects, with improvement in the post-intervention mean score to 4.01 (257 subjects) (Haynes et al., 2011), significant improvement in overall mean safety scores from 42.5% (2004) to 52.2% (2006), $t=6.21$, $p<.001$, with scores higher in the faith-based ICUs and smaller-bed hospitals (Sexton et al., 2011), and a major concern (39% of staff) regarding the large

number of patient types admitted to the surgical unit which caused multiple communication problems, and medication errors concerns (33% of staff) (Timmel et al., 2010).

Several study limitations surround these SAQ studies. First, one study was unable to track the survey response rate due to the restrictions of the survey methods under human-subjects committee oversight (Haynes et al., 2011). Second, Sexton et al. (2011) project used historical rather than a concurrent control or randomized design. Lastly, it was evident that these surveys were administered within the context of greater quality improvement projects in each study, which influences the findings and the intervention impact.

Two of the three studies that used an unidentified tool involved large-scale samples with extensive training interventions conducted between time one and two (Ginsburg, Norton, Casebeer, & Lewis, 2005; Stevens, Bader, Luna, & Johnson, 2011), while Bechtold, Scott, Nelson, Cox, Dellsperger and Hall (2008) used a small sample of 58 medical residents. Significant findings in these studies included a statistically significant improvement in one of three safety culture measures (valuing safety) for the study group ( $p < .001$) and a significant decline on one of the safety culture measures (perceived state of safety) for the control group ( $p < .05$) (Ginsburg et al., 2005), mean pre-test scores of 15.75 (out of 20 points) and 18.94 on the post-test (Stevens et al., 2011), and post-intervention scores of six items moved in the desired direction with no statistical significance noted (Bechtold et al., 2008).

Limitations of these studies include the total number of changes and variation of the program changes made in a relatively short period of time in all three studies. In

addition, each study mentioned the presence of active support for safety programs by nursing leadership and managers.

Lastly, one study (Pronovost et al., 2005) implemented an 8-step safety program in two ICUs (with one as a control group), using the Safety Culture Survey (SCS) at two points in time. Findings indicated that safety culture improved post versus pre-intervention (35% to 52% in the intervention unit (66 and 64 subjects, respectively) and 35% to 67% (23 and 21 subjects, respectively) in the control unit). Limitations of this study are the use of only two staff units, and the convenience and small sample.

***Summary***

As noted in the literature review, there are several culture of safety instruments available that have been used for either exploratory or interventional studies. Along with the HSOPS, researchers have used the PSCHO, the SAQ, the SCS, and the NCS as well as unidentified surveys. The HSOPS continues to be the only instrument approved by the AHRQ, and an instrument which also continues to provide consistent comparative outcome data.

Of the eleven interventional education patient safety studies conducted from 2005 to 2011, only three studies used the HSOPS instrument. While Mayer et al. (2011) used the HSOPS instrument, they also used two other surveys with the staff. Their intervention program was also extensive and involved multiple emphases, and was supported by a Federal grant. With the exception of two studies (Timmel et al., 2010; Pronovost et al., 2005), the majority of the studies involved large samples and several agencies, as well as complex interventions.

The literature review demonstrates several types of descriptive studies and educational intervention studies, as well as various sample sizes. While each of the descriptive survey studies add to our understanding of staff perceptions of their work area culture of safety, most of the studies used convenience samples and no control or comparison groups. The studies of education interventions also add to our knowledge of how to assist staff perceptions changes, but they did not provide clear education intervention choices that hospital leaders and managers can implement without a financial burden or extensive length of time. The range of safety-focused interventions, such as CUSP, an SBAR tool, or multidisciplinary teams, can make it difficult for a manager to select a valid and proven intervention to improve their nursing unit's culture. Also, although Mayer et al. (2011) used part of the Department of Defense (DOD) modules in their long-range study, they also used several other complex interventions that impact our understanding of how the DOD education modules taken alone influence staff perceptions.

# CHAPTER 3

# THEORETICAL FRAMEWORK

This chapter discusses the main theoretical foundation of Donabedian's Structure-Process-Outcome (SPO) framework which provides a basis for this study in further description of the main research and education constructs. The framework is defined and examples of past research that integrated this framework are reviewed. In addition, the research assumptions, concepts, and hypotheses are discussed.

## Theoretical Framework

It has been recently argued that no theoretical framework on the nature of the underlying phenomenon of patient safety culture has been created (Reiman, Pietkainen, & Oedewald, 2010). These authors further contend that patient safety culture (PSC) can be defined as the willingness and ability of an organization to understand safety as well as the willingness and ability to act on safety. In addition, a recent qualitative meta-analysis of a culture of safety found that safety culture is a complex phenomenon that is not clearly understood by hospital leaders, thus making it difficult to operationalize (Sammer, Lykins, Singh, Mains, & Lackan, 2010). This complex phenomenon makes it difficult to use a safety culture theoretical framework in research. Therefore, a quality paradigm will be used in this current study.

Even as students, nurses learned that patient safety and quality have a long history, traced back to the efforts of Florence Nightingale in the 1880s (American Association for the History of Nursing, 2011). More recently, the vigorous discussion on health care quality has been influenced by Avedis Donabedian's (1966, 2005) writings which view quality of medical care in terms of structure, process, and outcome (SPO) (Larson & Muller, 2002). SPO is an abstract theoretical framework that has been applied

extensively to medical care quality in general. Donabedian's (1966, 2005) theoretical framework of Structure-Process-Outcome model was used as the foundation for the theoretical concepts planned in this study. The theory has been applied to multiple medical quality studies for many years and works well to map out nursing environment and culture of safety studies. Therefore, Donabedian's quality Structure-Process-Outcome paradigm (Donabedian, 1966, 2005) is a useful framework for evaluating and improving nursing work environments and patient safety (Kramer & Schmalenberg, 2005).

Structures influence processes and processes influence outcomes (Donabedian, 1966, 2005). *Structures* include organizational supports and human resource attributes, such as staff composition and leadership styles. *Processes*/relationships, such as shared decision making, are a series of actions that result in outcomes. *Outcomes* may include positive nurse outcomes such as increased job satisfaction and organizational commitment, or patient outcomes such as reduction in pressure ulcers in postoperative patients. The linkages between structures and processes (SP) and processes and outcomes (PO) have not been well explored (Kramer & Schmalenberg, 2005; Kramer et al., 2010). Figure 1 displays the conceptual framework map for this study.

**Nursing Studies using Donabedian's Framework**

Donabedian's framework has been used extensively in studies surrounding the quality of patient care. In 1989, for example, a study of nurse and patient agreement of their outcomes after surgery was completed (Kovner & Horn). In Scotland, Closs and Tiemey (1993) evaluated discharge planning for elderly patients using a structure, process and outcome framework. These authors described the difficulty in explaining the difference

between structure and process in program changes, and made suggestions on how to apply these concepts. The SPO framework seemed a good fit for this study as discharge planning is a process embedded within concise standards and policies, as well as larger rather intangible structures, such as federal guidelines that change from year to year.

More recently, studies have focused on patient's perceptions of their care. One study explored the impact of integration of both inpatient and outpatient units on cancer patients' satisfaction (Wessels et al., 2010), while another study examined patients' perceptions of nursing service quality (Kobayashi, Takemura, & Kanda, 2011). In addition, an integrative review was conducted on nursing home residents' quality of mental health care (Grabowski, Aschbrenner, Rome, & Bartels, 2010). In these patient care-focused studies, the SPO model fit well as each study could readily apply aspects of patients' perceptions of satisfaction and quality care not only as measurable outcomes, but also related to the processes and structures changed before these measures.

In other nursing areas, Donabedian's framework was used to explore the impact of electronic nursing documentation on improvement in quality of patient care (Kelley, Brandon, & Docherty, 2011). The SPO model fit appropriately for this study as they used the online documentation as the structure, the interaction with the patient documented as the process, and the patient's health status at discharge as the outcome. In education, a recent study suggested that educators must consider patient outcomes when assessing the impact of clinical training (Dauphine, 2012). Their argument of outcomes of student care fit well with the SPO framework and is a vital discussion for educators.

Few studies have used this framework to explore nurses' perceptions of their practice environment. One recent study focused on transforming work place relationships through

shared decision making, and found that conflict management was an important shared decision making sub-process that they needed to add to their SPO framework (MacPhee, Wardrop, & Campbell, 2010). This study supports the use of the SPO framework for nursing communication skills intervention plans.

As demonstrated in the studies that integrated the SPO framework within their methods, exploring "perceptions" works well for outcomes of process of care changes, or other type of interventions. Therefore, the SPO framework fits well for exploring nursing staff perceptions of a culture of safety. For the proposed study with this theoretical framework, the structures include selected demographic characteristics of the sample, as well as certain work environment/organization characteristics such as eight or twelve-hour shifts and RN and nursing assistant skill mix on acute care units. An educational intervention was conducted as the "Process" change with the intervention group, after a pre-intervention assessment, and offered to the control group after the post-intervention assessment. The outcome in this study was the Mean total safety score at two times, as well as Mean scores on selected dimensions, including teamwork, communication, and other dimensions as listed on Figure 1.

**Conceptual Definitions**

The following conceptual definitions were used in this study: (a) acute care nurses are nurses who work in a hospital as specialized personnel using complex and sophisticated technical equipment and materials (Mosbys, 2009).; (b) a culture of safety is defined as a supportive environment where staff nurses collaborate on patient care and safety (Sorra & Nieva, 2004); and, (c) a perception of a culture of safety is demonstrated by the total

score and by the separate scores on dimensions in the HSOPS survey, such as teamwork within the unit, communication, and staffing (Sorra & Nieva, 2004).

**Operational Definitions**

The following operational definitions will be used in this study: (a) acute care nurses are nurse staff who work in the study hospital as specialized personnel using complex and sophisticated technical equipment and materials (Mosbys, 2009); and (b) a culture of safety is operationally defined by measurement with the Hospital Survey on Patient Safety (HSOPS) by Sorra and Nieva (2004).

**Hypotheses**

1. There will be a statistically significant positive change in the total HSOPS score of the intervention group as compared to the control group, between Time 1 and Time 2.

2. There will be statistically significant changes in the mean difference of select HSOPS safety dimension scores, such as teamwork, communication, and staffing, in the intervention group at Time 1 and Time 2.

**Assumptions**

For the purpose of the study, the following assumptions were made:

1. Patient's expect they will receive safe care by nursing staff.

2. Nursing staff are not currently competent regarding the concepts of a culture of safety, nor do all nursing staff work within a culture of safety.

3. Some nurses may have had previous education or training regarding communication and collaboration, and/or a culture of safety.

4. Participants respond truthfully to all questionnaires.

5. There is a relationship between a staff nurse's perceptions of a safety culture in their work environment and their ability to provide a culture of safety during patient care.

6. A lack of nursing competence regarding a culture of safety in patient care has a negative impact on patient outcomes, while increasing nursing competence concerning a culture of safety decreases negative health outcomes and patient errors. (5. and 6. are assumptions only and are not measured within this study).

**Definitions of Terms**

***Registered nurses***: Healthcare professionals who are registered and licensed to practice nursing. They have completed nursing school and have passed an exam administered by the Nevada State Board of Nurse Examiners. For the purpose of this study, a registered nurse is defined as any registered nurse employed in the study hospital on one of the study units, working either part-time or full-time.

***Patient Safety Culture:*** 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 (Sorra & Nieva, 2004). Organizations with a positive safety culture are characterized by communication founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measure (Sorra & Nieva, 2004).

***Communication Openness:*** Staff freely speak up if they see something that may negatively affect a patient, and feel free to question those with more authority. Measured by items *C2, C4, C6* (Sorra & Nieva, 2004).

***Feedback & Communication about Error:*** Staff are informed about errors that happen, given feedback about changes implemented, and discuss ways to prevent errors. Measured by items *C1, C3, C5* (Sorra & Nieva, 2004).

***Frequency of Event Reporting:*** Mistakes of the following types are reported: 1) mistakes caught and corrected before affecting the patient, 2) mistakes with no potential to harm the patient, and 3) mistakes that could harm the patient, but do not. Measured by *D1, D2, D3* (Sorra & Nieva, 2004).

***Hospital Handoffs & Transitions:*** Important patient care information is transferred across hospital units and during shift changes. Measured by *F3, F5, F7, F11* (Sorra & Nieva, 2004).

***Hospital Management Support for Patient Safety:*** Hospital management provides a work climate that promotes patient safety and shows that patient safety is a top priority. Measured by items *F1, F8, F9* (Sorra & Nieva, 2004).

***Nonpunitive Response to Error:*** Staff feel that their mistakes and event reports are not held against them, and that mistakes are not kept in their personnel file. Measured by item *A8, A12, A16* (Sorra & Nieva, 2004).

***Organizational Learning–Continuous Improvement:*** There is a learning culture in which mistakes lead to positive changes and changes are evaluated for effectiveness. Measured by *A6, A9, A13* (Sorra & Nieva, 2004).

***Overall Perceptions of Safety:*** Procedures and systems are good at preventing errors and there is a lack of patient safety problems. Measured by items *A10, A15, A17, A18* (Sorra & Nieva, 2004).

***Patient Safety Grade of the Hospital****:* How the staff rate the hospital overall on safety. Measured by item *E1*.

***Staffing:*** There are enough staff to handle the workload, and work hours are appropriate to provide the best care for patients. Measured by items *A2, A5, A7, A14* (Sorra & Nieva, 2004).

***Supervisor/Manager Expectations & Action Promoting Safety:*** Supervisors/managers consider staff suggestions for improving patient safety, praise staff for following patient safety procedures, and do not overlook patient safety problems. Measured by *B1, B2, B3, B4* (Sorra & Nieva, 2004).

***Teamwork across Units:*** Hospital units cooperate and coordinate with one another to provide the best care for patients. Measured by items *F2, F4, F6, F10* (Sorra & Nieva, 2004).

***Teamwork within Units:*** Staff support one another, treat each other with respect, and work together as a team. Measured by *items A1, A3, A4, A11* (Sorra & Nieva, 2004).

***Definition of Positive, Neutral & Negative:*** Positive is the percent of responses that are rated a 4 or 5 (Agree/Strongly agree or Most of the Time/Always) for positively worded questions, or a 1 or 2 (Disagree/Strongly Disagree or Rarely/Never) for reverse-worded questions. Neutral is the percent of responses that are rated a 3 (Neither or Sometimes) for any question. Negative is the percent of responses that are rated a 1 or 2 (Disagree/Strongly Disagree or Rarely/Never) for positively worded questions, or a 4 or 5 (Agree/Strongly Agree or Most of the Time/Always) for reverse worded questions (Sorra & Nieva, 2004).

***Structure:*** The attributes of the organization's setting where the care is delivered and takes place. Structural indicators include the characteristics of physical structure, facilities, personnel and resources, as well as the administrative and staff organization, including staff-client ratios, skill mix, and resources. Resources include adequacy of facilities and equipment, procedures available and physician specialty, appropriate education training for staff, and organizational characteristics such as a religious-based hospital (Donabedian, 1966, 2005). For the purpose of this study, the key structural indicators are selected demographics, and the characteristics of the setting, such as skill mix, collective bargaining, and other unit characteristics as listed in Figure 1.

***Process:*** Behaviors and practices of healthcare providers and patients, staff-patient interactions, and services provided (Donabedian, 1966, 2005). For the purpose of this study, process indicators will be the educational intervention.

***Outcome:*** Indicators of quality of the end result, that is, what actually happens to the patient. Examples of outcome quality indicators include the development of pressure ulcers, frequency of falls, and mortality rates. Outcomes of care include clinical outcomes as well as patient attitudes, satisfaction, and health-related knowledge (Donabedian, 1966, 2005). The outcome in this study is nurses' perceptions of the patient safety culture dimensions, operationalized by the HSOPS survey.

**Summary**

In summation, a culture of safety is a supportive work environment where nurses collaborate on patient care and safety. The dimensions of this safety environment include teamwork, clear communication, management support, and trustworthy reporting of errors. A culture of safety can be improved upon by educational interventions, such as an

online safety module. Managers can enhance the safety culture in their work areas by engaging in programs that are designed to support nursing staff with online safety education. Donabedian's structure-process-outcome framework provides a method to explore the influence of an educational intervention on acute care nursing staff perceptions of a culture of safety.

# CHAPTER 4

# METHODOLOGY

This chapter describes the study methodology. Specifically, the research design, the intervention, the sample, ethical considerations, and data collection are addressed. The data analysis plan is discussed as well as the selected variables, including demographics and the educational intervention. Figure 2 displays the study design processes.

## Design

This study is a quasi-experimental two group pre-test and post-test design utilizing volunteer subjects from two randomly selected groups of nurses. In total, four hospitals agreed to take part in this study. First, the administrators of a 400-bed community hospital in the southwestern United States agreed that their staff could participate in the study, and then administrators from three other acute care hospitals in the same state agreed to take part. The study processes with these agencies are discussed in this chapter and were followed after approval from the UNLV Institutional Review Board for the Protection of Human Subjects (IRB) (see Appendix E) and the appropriate hospitals' IRB approval.

In quasi or experiment studies the validity of the survey is vital. For the HSOPS survey, the validity of this tool has been discussed thoroughly in Chapter 2. The threat to the internal validity of testing effects was decreased by using a study control group, while the threat of influence of history was minimized by using a short time period between the pre- and post-test (Time 1 and Time 2) for each group. Sampling bias was minimized by random assignment to the educational intervention group and the control group, which is discussed further in data collection.

In assessments of the validity of studies of healthcare interventions, selection bias refers to systematic differences between comparison groups in responsiveness to treatment. Random allocation with adequate concealment of allocation protects against selection and sampling bias (Moher, Schulz, & Altman, 2001). Proper randomization as a rule eliminates selection bias by balancing both known and unknown predictive factors in experimental groups (Moher et al., 2001).

The educational intervention, which is designed to be used either online or with a live audience, is discussed further in the procedures below. Additionally, the short study timeline, which is also discussed further below, was intended to decrease the risk of maturation effects, mortality, and attrition (Polit & Beck, 2008). As an incentive for participation, participants who completed the survey both times and completed the educational intervention module received three (3) Continuing Education Units (CEUs). This includes those randomly placed into the control group who were given the option to complete the culture of safety education module for CEUs after the survey at Time 2 was completed. The student researcher submitted a request for CEU approval to the UNLV School of Nursing, a CEU provider approved by the Nevada State Board of Nursing, and was granted approval for CEUs for the study (see Appendix G). External validity was enhanced by using random assignment to the two groups and using power analysis to determine the appropriate study sample size to increase the representativeness of the sample.

**Population and Sample**

The target population for this study includes all nurses working in adult acute care units in the United States. The accessible population in this study was the current RN

staff working at the bedside level on any of the acute care nursing units, as well as the emergency department nursing staff, at four urban hospitals in the Western United States. There were approximately 20 acute care nursing units and four large emergency departments in the participating hospitals and the total accessible population was approximately 1,600 nursing staff. The emergency and intensive care units were included in the sample as they are ripe for a culture of safety intervention due to conflict and disruptive behavior reported at higher levels in these areas (Kelly, 2006; Vivar, 2006). A convenience sample with random assignment into control and intervention groups was used to recruit RNs working on these acute care and emergency units. Attempts to reduce the limitation of this sampling method and to increase appropriate representation were made to ensure a wide range of RNs across the units were recruited.

The convenience sample methodology was based upon the following inclusion criteria: 1. RNs are currently employed as a staff nurse on any of the acute care units or in the emergency department; 2. They had worked on their respective unit for at least one month, whether Full-time, Part-time, or Per Diem status; 3. They had personal email, access to a computer with Internet capability, as well as Windows media player and PowerPoint; and, 4. At one hospital, they had an identification and password to log into *Healthstream* which was their agency's online education site to access the education module. Exclusion criteria included RNs not employed in the areas described in the inclusion criteria.

Random assignment into study and control groups was conducted and the student researcher let all of the staff know that if they participated in the study they would have access to the education module at some time during the study, which was intended to

assist in assuring fidelity of the educational intervention and the survey outcomes between Time 1 and Time 2.

Treatment fidelity is important in research design planning as it may impact the internal and external validity of a study, the effect size of the tested intervention, and statistical power (Resnick et al., 2005). Burns and Grove (2009) describe treatment *diffusion* which occurs when the control group subjects communicate with the experimental subjects who are then exposed to aspects of the study treatment. This could result in similarity in the outcomes between each group, even though the educational intervention actually made a difference (Burns & Grove, 2009, p. 223). A standardized treatment protocol, particularly with complex interventions (Spillane et al., 2007) and training of research assistants are mentioned as vital needs.

In this current study, treatment fidelity was controlled by four strategies: 1. This study was not complex and had a protocol of a specific intervention and delivery of the intervention; 2. One researcher was involved with no research assistants to train; 3. On the consent form it was mentioned "no matter what group you are in, we would like you to avoid talking about the study and content during this study for approximately one month. Please do not share the content of this study with anyone else until May 2013"; and, 4. The administrative leaders at each hospital were supportive of this study and voiced no plans to introduce any culture of safety projects during the study period.

Sample Size

The factors that must be considered in decisions about sample size are the effect size, the type of study, the number of variables, the sensitivity of the measurement methods, and the data analysis techniques (Flikkema & Toledo-Pereyra, 2012). The deciding

factor in determining an adequate samples size for quasi-experimental studies is power (Burns & Grove, 2009). Power is the capacity of the study to detect differences or relationships that actually exist in the population, as well as the capacity to correctly reject a null hypothesis (Burns & Grove, 2009). The minimum acceptable power for a study is 0.80 (80%) (Flikkema et al., 2012; Burns & Grove, 2009).

The desired sample size for this study was 106-111 participants (53-55 per group) using the repeated measures analysis of variance (RM-ANOVA) with a within-between interaction statistical F-test to test the equality of means (to model the correlation between the repeated measures), a medium effect size of 0.55, the desired power level of 0.80, an alpha (probability) level of 0.05. This formula was based on an A-priori Sample Size Calculator for a repeated measures test from the danielsoper.com website. The formula entered in G* Power 3.1.3 (cited often in research studies reviewed) with a smaller medium effect size of 0.35, desired power the same at 0.80 and alpha the same at 0.05 for F-tests with factorial ANOVA: Repeated measures, within-between interaction, with a 2 by 2 factorial design, resulted in a sample size of 111 total. Therefore, the desired sample size was 108 (the average of the two sample formula sizes).

A medium effect size is considered appropriate considering effect sizes from previous safety studies, including: Cohen's d = 0.34 and 0.55 at time one and two, respectively (Ginsburg et al., 2005) and Cohen's d = 0.72 (Armstrong et al., 2009) and Cohen's d = 0.85 (Zohar et al., 2007). Most significantly, a recent study that used the HSOPS as well as the education module as part of a mixed model, four time-period study had Cohen's d = 0.64 (Mayer et al., 2011). In this study, a sample of 180 was targeted with a desirable

response rate of 60%. A 60% response rate is generally accepted as a minimum threshold in survey research to reduce the risk for response bias (Flikkema et al., 2012).

**Instruments**

The data was obtained with the 42-item HSOPS survey (see Appendix S) that has ordinal and interval level questions, as well as one open-ended question. The major variables of interest in this study are the 12 dimensions of a culture of safety and seven demographic characteristics. Figure 1 includes the seven demographic variables as well as the 12 dimensions of patient safety culture. The culture of safety is operationally defined as participants' responses to the 42-item HSOPS that is designed to assess the safety culture of a hospital as a whole, or within specific units.

There are 39 questions that address seven unit-level aspects of safety culture and three hospital-level aspects of safety culture, and have five levels of responses per question, ranging from (1) strongly disagree, to (5) strongly agree. There are three (3) additional questions regarding frequency of reported events or mistakes, with five levels of responses offered, ranging from (1) never, to (5) always. The survey has a total score which can range from 42-210, and 12 subscale scores that can be computed. However, total safety score is usually reported as a Mean overall raw score and percentage, from all of the 12 dimensions. The HSOPS was available free of charge at the Agency for Healthcare Research and Quality (AHRQ) patient safety website, and was prepared as a Web-based (SurveyMonkey.com) survey. The AHRQ is the lead Federal agency charged with improving the quality and safety of patient care.

Instrument reliability and validity: Sorra & Nieva, (2004) stated that all dimensions were shown to have acceptable levels of reliability (defined as Cronbach's alpha equal to

or greater than .60), with reliability coefficients ranging from .63 to .84. Sorra & Nieva (2004) stated that the correlations between the safety culture composites or scales ranged from .23 (between Non-Punitive Response to Error and Staffing or Frequency of Event Reporting) to .60 (between Hospital Management Support for Patient Safety and Overall Perceptions of Safety).

Demographic items that were collected in this study included gender, age, ethnicity, education level, how long they have worked in the hospital, how long they have been a nurse, and any previous culture of safety education or training. Since the study focused entirely on RN staff, a prior question on the HSOPS regarding their type of staff position was deleted. The AHRQ allows editing of the survey as needed to fit well with new research studies.

**Procedures and Data Collection**

Overall, the data collection plan needs to have a clear description regarding resources needed, the availability of the survey instruments, the target population and the sample (Polit & Beck, 2008, p. 379). After appropriate UNLV IRB and the hospitals' IRB approval was received, in collaboration with the Chief Nursing Officers or their assigned leader at each of the four hospitals, the study plans and timeline were presented to the acute care, ICU, and ED nursing managers and nursing supervisors. At one hospital, the "InfoFlash" (the weekly email newsletter sent to all hospital employees) was approved to send out study information, and the student researcher joined each unit's daily huddles, and posted the fliers on each unit. The huddles were very brief "standup" meetings so the handouts (see Appendix K) were vital for staff to know how to volunteer for the study. At the three other hospitals (part of one hospital system), handouts (see Appendix L)

were sent to each hospital using United Parcel Service and provided by the nursing managers at their staff meetings, and two of these three hospitals also sent a mass email to their nursing staff.

The handout provided information on how to send their email address to confirm their interest in volunteering for the study, how to access the online SurveyMonkey.com link to complete the surveys, the dates to access the survey (at Time 1 and Time 2), and that their name and license number would be needed to provide their CEU certification at completion of the study. It also explained that only the student researcher and CE provider (Chair of the student's dissertation committee) have access to this information only for purpose of providing the free CEUs. Interested nurses were directed to the online survey via SurveyMonkey. The first page they saw was the research consent form.

The SurveyMonkey program allows consent forms to be in front of the actual online survey. The first page was therefore the research consent (form and information that were approved by the UNLV IRB; see Appendix F). After reading the consent form, there was a statement that when they click "Yes" at the end of the form they will go to the start of the HSOPS survey. If they clicked on "No", they did not go forward.

In summary, at one hospital, the student researcher attended staff huddles on six different nursing units at 6:45AM and 6:45PM six times per unit (for a total of 24 Huddle visits) to explain the study, provide the study handout, and explain the weeks the surveys and education module were available, and that the researcher would check to see if surveys were being completed. After these recurrent efforts, a small total of staff actually completed the study. Therefore, six more hospitals were contacted regarding the study, with three of these six hospitals agreeing to take part. At that point in time, the UNLV

Human Subjects Modification forms were prepared and approved (see Appendix M). The student researcher attended management meetings at each of the three additional hospitals to present the study and to plan appropriate recruitment of RN staff. Recruitment strategies at these hospitals involved identifying a contact person, sending handouts to the administrative staff via United Parcel Service who then provided the handouts to the nursing managers to hand out at their staff meetings. The student researcher did phone calls and emails to the contact person at each hospital also to request assistance on recruiting staff during the two weeks prior to the Time 1 survey.

Pre-survey activity: After a staff member received a handout (either in a huddle or from the unit manager), the unit staff sent his/her email address to the researcher to confirm interest in the study, and for CEUs upon completion of the study. The researcher randomly sorted the volunteers into the study and control groups, and emailed the volunteers regarding how to access the survey and the dates for the survey, as well as how to access the education module, as appropriate.

Random assignment to groups involves a procedure to assign subjects to treatment or comparison groups in which the subjects have an equal opportunity to be assigned to either group (Burns & Grove, 2009). While there are multiple possible methods for assuring random assigning of subjects, a traditional approach using the alphabet with numbers representing each letter was used by the student researcher. Each nurse who volunteered for the study had their last name in their email message. The last letter of each last name was changed to the appropriate number, to separate the two groups by an odd number representing the intervention group and an even number representing the control group. For example, if the last name was Jones, the RN would be in the

intervention group as "s" equals number 19 (an odd number). The participants' names were no longer used or saved after the group assignments were made. Separate email groups for the control group and the intervention group were prepared with no names identified. Therefore, only email addresses were used to send appropriate reminders for each survey and the education module.

The study began in Week 1: the Time 1 survey was available online for both randomly sorted groups; Weeks 2-3: Intervention group completed the online education module, Week 4: Time 2 survey was available online for both groups. Reminders were sent via email two times during each survey and three times during the education module weeks.

The educational intervention was a web-based educational intervention focusing upon the critical domains of teamwork, communication, management support, and reporting of errors. The intervention was Module 1 from the free "Professional Conduct Toolkit" online modules provided by the U.S. Department of Defense (DOD) (2010), which most closely matches the domains in the HSOPC. Module 1 covers professional conduct, teamwork, and patient safety and takes approximately one to two hours to complete. Table 1 lists the contents of Module 1. Staff accessed this module via *Healthstream* (their online educations system) at one hospital, and via SurveyMonkey at the other three hospitals. The new DOD education modules were used in Mayer et al. (2011) as mentioned previously, and as of mid-2012, no other studies had been published using any of the modules. Therefore, this study was one of the first to use an individual DOD safety module to test the effectiveness for staff education online.

Recruitment strategies

Within acute care hospital settings, it is essential to have the support of gatekeepers, when seeking access to their staff (AHRQ, 2008). The researcher began this process with one hospital's PhD-prepared Director of Education in Fall 2011. This staff member assisted with providing IRB forms to the student researcher, as well as a face to face meeting with the Nursing Chief Officer during February 2012. As a result of this meeting, the researcher received approval for the study pending both the UNLV and hospital's IRB approval, as well as further contact with the hospital managers about the study. The hospital had no culture of safety intervention plans during the study period. As previously mentioned, this hospital also used the "Infoflash" to advertise the study, and allowed the student researcher to join their staff huddles for recruitment.

At that particular agency the RN staff were represented by the California Nurses' Association (CNA) union and the Chief Officer found that there were no issues regarding this study with the RN staff as the union was currently concerned about patient safety and clear staff communication to prevent errors. The student researcher spoke with the Human Resources CNA representative who was pleased the study design involved a voluntary sample. At the three other study hospitals, huddles were not utilized, but handouts were provided by managers and supervisors at their individual staff meetings.

As an incentive for participating in this study, the participants received 3 CEUs via UNLV (the researcher applied for the CEUs as part of the study plans) upon completion of the education module and surveys (one hour total for the survey two times, one-two hours to complete the online module), and received their certificate via the email address they sent when they volunteered for the study. Only the researcher and advisor had access to the email information.

**Data Analysis**

The completed online surveys were automatically saved upon completion at SurveyMonkey.com. At Time 1 and Time 2, each group's survey data were downloaded directly into SPSS. SPSS 21 was used to analyze the data. The analysis of data was conducted according to the objectives and purpose of this study.

Procedures for accuracy of data entry and missing values were conducted, as well as individual item analysis to identify and eliminate those items that are highly skewed (none were skewed) or had large amounts of missing data. Previous studies have indicated that most staff fully complete the HSOPS survey because it has fewer questions than some safety surveys and is easy to complete online (Sorra & Nieva, 2004; Sorra & Dyer, 2010). In this study, none of the surveys had empty questions, except the open-ended question which no intervention group members answered.

Demographic data used to describe the sample included age, gender, ethnicity, level of education, years of experience in the hospital, years of experience as a nurse, and previous safety training (yes/no). Frequency distributions were performed to describe the demographic variables. Previous studies have explored the influence of nursing staff age, their years of experience and how many hours they work, as well as any previous safety training completed prior to a current education intervention (Andreoli et al., 2010; Mayer et al., 2011; Pronovost et al., 2005; Scherer & Fitzpatrick, 2008).

In addition, descriptive procedures were completed to describe the sample (percentage, means, standard deviation, and range). The data were analyzed to determine the range of mean scores and the mean culture of safety score intensity. Mean scores for select HSOPS dimensions, which included staffing, teamwork within units, teamwork

across units, communication openness, and handoffs/transitions, were calculated and an overall mean score for the hospital overall safety score was obtained for each group at each time. In addition, confidence intervals (CI) were analyzed to check the reliability of the results, and independent t-tests and paired sample t-tests were conducted, with a 2 x 2 model to assess whether there was a significant difference between the intervention and control groups. Repeated measures ANOVA was conducted on the five selected HSOPS dimensions Mean scores to assess whether there was a significant difference between the intervention and control groups at Time 1 and Time 2.

Findings on the group's total safety scores (TSS), at two times were of primary interest, to compare the level of safety perceptions before and after the intervention, and to compare both groups. Outcomes were also analyzed using the "5% rule of thumb" as suggested by the survey authors (Sorra & Nieva, 2004); that is, results must be at least 5% higher or lower to be considered *clinically* significant. In addition, outcomes were analyzed for statistical significance at both survey times. Exploratory analysis of all twelve dimensions of the culture of safety were conducted, with particular interest in the dimensions of teamwork within and across units, clear communication, hospital handoffs, and staffing, which have been described in past HSOPS studies.

Pre- and post-test designs are often analyzed with a between-groups variable with repeated measures ANOVA (RM-ANOVA) (Shin, 2009; Thomas & Zumbo, 2012). Independent t-tests were used to evaluate the effect of the training intervention on perceived safety as this method, as well as RM ANOVA, has been suggested for intervention studies with two or more groups and two or more survey times (Shin, 2009; Thomas & Zumbo, 2012).

Limitations of this study included possible attrition of the sample. Attrition is a concern in a two time-period design study; however, the entire study was done within a short timeline (see procedure area). Limitations of this study are discussed in further detail in Chapter 6.

**Ethical Considerations**

There were no anticipated untoward effects of participating in the study and there were no adverse effects of not participating or of withdrawing from the study at any time. Potential participants were informed that their information was confidential and findings only reported by groups. Anonymity was fostered, but the student researcher and the UNLV Continuing Education coordinator had access to each participant's true identity as well as their RN license number for the purpose of granting CEUs upon completion of the study. This is elaborated upon in the data collection section of this chapter. Informed consent was obtained for this study according to the UNLV IRB approval.

In the online survey format, the IRB approved allowing consent to be given when the nurse went online to begin the first (Time 1) survey. The survey access was described in the data collection area. Also, Bernal (2010) has argued that a collaborative process of assuring that subjects understand their consent in an Internet study has become vital. Therefore, for research ethics, the last question on the online consent said: "I have read the above information and agree to participate in this study. I am at least 18 years of age." They clicked on "yes" to go forward, and if they clicked on "no," the subjects were disqualified from the survey.

Providing online access to the survey, and to the educational module either via their usual *Healthstream* site (at one hospital) and via SurveyMonkey at all three other

hospitals, that could be entered and completed on their own time assured that staff participation was voluntary and promoted the participants' rights based on the ethical principles of beneficence, fairness, and autonomy (Polit & Beck, 2008). The right to self-determination is important to assure prospective participants had the right to decide voluntarily whether to take part in the study without risking any prejudicial treatment, as well as the right to full disclosure about the study before deciding to participate (Polit & Beck, 2008). The consent form provided full disclosure and explained their rights for continuing in the study or withdrawing at any time with no intended effect on their work or private life.

Protection of subjects' information on the survey itself was assured, with the entire online survey package (via a SurveyMonkey private web link) being completed anonymously to assure confidentiality (Polit & Beck, 2008). Responses of staff nurses were not shared with their managers nor reported in any format other than aggregate data analysis. The risks to the participants were minimal in this design, and the participants could choose not to complete the survey or the education module at any time. Possible risks included discomfort answering some of the survey questions, and discomfort with some of the content in the educational intervention.

Table 1.

Module 1: Professional Conduct, Teamwork, and Patient Safety

| **Module Contents:** | **Time:** |
|---|---|
| Joint Commission Sentinel Event # 40 & Video:<br>Prevalence & Impact of Unprofessional Conduct (Experts on professional conduct and disruptive behavior). | 10 minutes |
| Slides (set 1-4): | 10 minutes |
| 1. Recognizing what works | |
| 2. Defining unprofessional conduct | |
| 3. Impact of unprofessional conduct | |
| 4. Patterns of unprofessional conduct | |
| **Videos**: Horizontal violence and bullying | 25 minutes |
| Two approaches: Enforcement and engagement (5 slides) | 10 minutes |
| Module 1 Summary | 5 minutes |
| Course evaluation/post-test | 5 minutes |
| Total approximate module time: | 65 minutes |

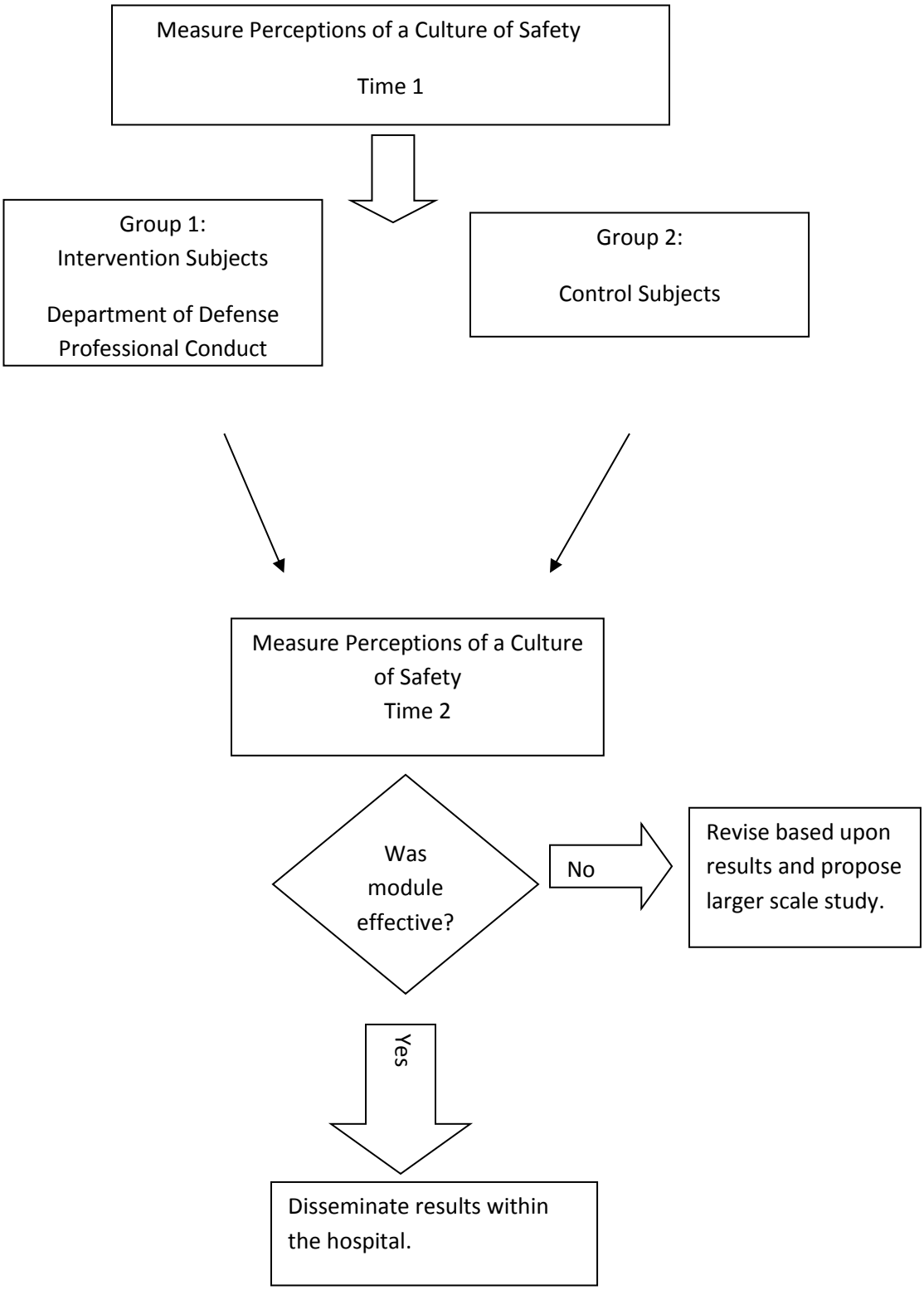
*Note: the videos in this module may take more time, as there are more videos provided in the module for "students" to review if interested. The student researcher reviewed all videos and it took approximately 90 minutes to review the entire module.

Figure 1.
The Conceptual Framework based on Donabedian's Theoretical Framework.

<table>
<tr><th>Structure →</th><th>Process →</th><th>Outcome</th></tr>
<tr><td>Selected Demographics:<br><br>1. Age<br>2. Gender<br>3. Ethnicity<br>4. Level of Education<br>5. Years of Experience<br>in Current Position<br>6. Years in Nursing<br>7. Previous safety training</td><td rowspan="2">Online Educational Intervention.<br><br>Topics:<br><br>Professional Conduct<br>Teamwork<br>Communication<br>Management support<br>Reporting of errors<br>Patient Safety</td><td rowspan="2">Patient Safety Culture & related dimensions.<br><br>Item numbers:<br>(r = reverse-worded)<br><br>1. Frequency of Event Reporting, Items D1, D2, D3<br>2. Overall Perceptions of Safety, Items A10r, A15, A17r, A18<br>3. Supervisor/Manager Expectations, Items B1, B2, B3r<br>4. Organizational Learning/CQI, Items A6, A9, A13<br>5. Teamwork within units, Items A1, A3, A4, A11<br>6. Communication openness, Items C2, C4, C6<br>7. Feedback & Communication about error, Items C1, C3, C5<br>8. Nonpunitive response to error, Items A8, A12, A16<br>9. Staffing, Items A2, A5, A7, A14<br>10. Management support for patient safety, Items F1, F8, F9r<br>11. Teamwork across units, Items F2, F4, F6, F10<br>12. Handoffs/Transitions, Items F3r, F5r, F7r, F11r<br><br>Other items:<br>Patient Safety Grade (of the Hospital Unit), Item E1<br>Number of Events Reported, Item G1</td></tr>
<tr><td>Work Environment Characteristics:<br><br>1. Religious-based hospital, & community hospitals<br>2. CNA – Collective Bargaining, non-collective bargaining<br>3. Management structure<br>4. RN & CNA Skill Mix<br>5. 8 or 12-hour shifts</td></tr>
</table>

Figure 2.

Flow Chart Illustrating Study Design: the following depicts the process and plan for the study and its findings.



# CHAPTER 5

# STUDY FINDINGS

This chapter presents the findings of the study. Demographic information about the sample is presented as well as the results of the two hypotheses. Test procedures conducted were independent and paired t- tests as well as repeated measures ANOVA.

## Response and Attrition Rates

The 87 nurses who volunteered for the study by emailing the student researcher were randomly assigned to the two groups (intervention and control) and were sent a SurveyMonkey link to the online HSOPS survey to complete the informed consent. Of those who volunteered for the study, 32 visited the SurveyMonkey website and provided informed consent to participate in the study: 17 from the intervention group and 15 from the control group. However, of the 32 individuals who completed the Time 1 survey during Week 1 of the study; 7 did not complete the survey at Time 2, thus the resultant usable sample was 25. In spite of announcements for the start of each survey, email reminders two times during each survey as well for the online intervention module (with the intervention group), prompt e-mail or phone responses to questions or concerns, only 14 individuals completed the online educational intervention. Thus, 14 participants in the intervention group and 11 participants in the control group (N=25) completed both the Time 1 survey and the Time 2 survey.

## Demographic Data

As previously stated, while 32 participants answered the demographic questions included in the Time 1 survey, only 25 resulted in the final sample. While the majority of participants were White/Caucasian (78.6%), 17.9% reported being Asian, and 1 person

reported "other". The mean participant age was 49 (with a range of 23 to 63 years of age); participants reported having 9 years of nursing experience on average, and 8 years on average working in their particular study hospital. The majority of participants reported their highest degree held was a bachelor's degree (50%), 28.6 % reported their highest degree was a graduate or professional degree, 21% held an associate's degree as their highest degree. Participants reported working in many acute care areas, with most (15 nurses) reporting working within acute care (57%) or ICU or Telemetry (28%), or the emergency department (ED) (14%). The vast majority of participants (64%) had taken part in previous culture of safety training with only 9 (36%) having had no type of previous culture of safety training. Please see Table 2 for full demographic and descriptive details of the 25 participants who completed the entire study, which included 14 participants in the intervention group and 11 participants in the control group.

**Table 2.**

*Demographic and Descriptive Information for those who Completed Both Surveys (N=25)*

| **Characteristic:** | **M** | **SD** | **Range** |
|---|---|---|---|
| **Age** in Years | 49 | 4.35 | 23-63 |
| **Years of Nursing Experience** | 9 | 2.50 | 1-16 |
| **Years in this hospital** | 8 | 2.30 | 1-16 |
| **Highest Level of Education Completed:** | | **%** | |
| Associate Degree | 5 | 20 | |
| Bachelor's Degree | 14 | 56 | |
| Graduate or Professional Degree | 6 | 24 | |
| **Previously Participated in Culture of Safety Training:** | | | |
| No | 9 | | |
| Yes | 16 | | |

**Hypothesis One**

Hypothesis One stated: "There will be a statistically significant positive change in the total safety score of the intervention group as compared to the control group, between Time 1 and Time 2."

Prior to conducting data procedures, the two sets of survey data were prepared by recoding the reverse-coded items on the HSOPS instrument (18 of 42 items). This recoding was conducted in SPSS 21.

This first hypothesis addressed the effect of the online Professional Conduct education module on the total safety score of the intervention group, and how this compared to the control group scores. Total safety scores were calculated from the Time 1 survey at the beginning of the study for the participants in the two groups and again at the end of the study from the Time 2 survey. While the 25 participants who completed the study were not equally divided among the two groups, since they were independent groups, all participants in the intervention and control group who did complete the study were used for analysis. Of interest in this study was the comparison of the difference between the total culture of safety score (TSS) before and after an educational intervention in both groups, and how these scores compare to the AHRQ benchmark of 61%. At Time 1 and Time 2, both group means were greater than the AHRQ benchmark: Intervention Group: Time 1: 65%, Time 2: 64%. Control Group: Time 1: 65%, Time 2: 65%. While the Intervention group mean TSS went down by one percent at Time 2, the Control group scores remained unchanged.

Independent t-tests:

Prior to running repeated measures analysis of variance, Independent t-tests were run for the Time 1 and Time 2 TSS means for both groups. An independent-samples t-test was run to determine if there were differences in the Total Safety Score (TSS) between the intervention and control groups at Time 1 and again at Time 2. Comparison of independent differences between groups with the educational intervention (yes or no) provided for the TSS for Time 1 Control group (M = 3.1, SD = .55), and Time 1 Intervention group (M = 3.2, SD = .55), revealed no significant differences between the groups $t(23) = -.255$, $p > .05$. Time 2 Control group (M = 3.27. SD = .53) and Time 2 Intervention group (M = 3.21, SD = .43) revealed no significant differences between the groups $t(23) = .285$, $p > .05$.

Participants in the intervention group at Time 1 had approximately the same mean TSS (3.24) as the control group at Time 1 (3.28). The Time 1 TSS mean percentages from these raw data scores equal 65% for the intervention group and 65% for the control group. Homogeneity of variances as assessed by Levene's Test for Equality of Variances was greater than $p = .05$.

At Time 2, the study found that participants in the control group had a higher raw score mean TSS (3.27) than the intervention group (3.21). The Time 2 TSS means percentages from these raw data scores equal 65% for the control group and 64% for the intervention group.

Paired-Samples t-test:

A paired-samples t-test was conducted on the Time 1 and Time 2 total safety score values, as a measure of within-group changes. Comparison of paired differences on the

TSS for the Time 1 TSS group (M = 3.2, SD = .54) and the Time 2 TSS group (M = 3.2, SD = .47) revealed no significant differences between the groups t(24) = -.199, p > .05.

On the paired-samples test table, the mean difference between each pair of variables was -.2502, which is less than zero. The confidence interval values demonstrate that the true population mean lies between -.28469 and .23465, with a 95% probability. The chance of this number occurring by chance alone is about .844 (or 84%).

Repeated Measures ANOVA:

It was planned that a RM-ANOVA with a between-groups variable would be used to assess the impact of the one intervention, at two times, on the HSOPS Total Safety Scores (TSS). This is not reported due to both t-tests procedures being non-significant.

**Hypothesis Two**

Hypothesis Two stated: "There will be a statistically significant change on the mean difference of select safety dimension scores, such as teamwork, communication, and staffing, in the intervention group at time 1 and time 2."

Repeated Measures ANOVA:

A repeated measures ANOVA was run to compare the significance of the mean scores for selected safety dimensions on the HSOPS, which have been interpreted in previous safety studies (Staffing, Teamwork within Units, Teamwork across Units, Communication Openness, and Handoffs/Transitions). The interaction effect was of interest, but the measure was not statistically significant: Wilks Lambda = .944, $F$ (5, 19) = .284, p = > .05. The repeated measures ANOVA determined that there was no statistically significant difference between the two points in time for the selected safety dimension scores in the intervention or control group. Therefore, we cannot conclude

that the educational intervention or time alone elicited a statistically significant difference in mean HSOPS dimension scores. And once more, since the overall ANOVA was not significant, there is no need to examine the pairwise comparisons (Shin, 2009).

The Descriptive Statistics table (Table 3) for both groups is presented to demonstrate slight shifts in the mean scores of the five selected dimensions between Time 1 and Time 2. For the Intervention group, mean scores for Teamwork within Hospital Units, and Handoffs and Transitions moved in a positive direction between Time 1 and Time 2, while Teamwork across Hospital Units, and Communication Openness moved in a positive direction between Time 1 and Time 2 for the Control group. In addition, the means of two dimensions dropped slightly (Teamwork within Hospital Units and Handoffs/Transitions) between Time 1 and Time 2 for the Control group. These data are further exhibited in Figure 3.

On the survey, data were collected regarding whether the participants had received any type of previous safety training. Sixteen participants replied "yes" to the question. While RM-ANOVA was conducted to measure the significance of previous safety training on a participant's TSS, no significant difference between mean TSS and previous safety training was found.

### Attrition

As evidenced previously, both groups had small attrition rates between Time 1 and Time 2 surveys. Specifically, 17% (3) of participants who completed the Time 1 survey did not complete the educational intervention and 26% (4) of participants who completed the Time 1 survey as the control group, did not complete the second survey at Time 2. These small numbers did not allow further exploration of attrition, such as Chi-square

tests of independence to evaluate the relationship between completion of the educational module intervention (yes/no) and (a) level of educational attainment, and (b) previous culture of safety training (yes/no). Information was not solicited and no information was provided from participants regarding reasons why they withdrew between Time 1 and Time 2, and/or did not complete the educational intervention.

Table 3.

RM ANOVA Descriptive Statistics – Intervention and Control group Time 1 and Time 2 on Five (5) Selected HSOPS Dimensions.

| Dimension: | Educational Intervention | Mean | Standard Deviation | N |
|---|---|---|---|---|
| **Staffing 1** | Yes | 2.8 | .83 | 14 |
| | No | 2.9 | .83 | 11 |
| **Staffing 2** | Yes | 2.8 | .52 | 14 |
| | No | 4.1 | .70 | 11 |
| **Teamwork Within Teams 1** | Yes | 3.9 | .63 | 14 |
| | No | 4.1 | .47 | 11 |
| **Teamwork Within Teams 2** | Yes | 4.1 | .54 | 14 |
| | No | 3.7 | .91 | 11 |
| **Teamwork Across Teams 1** | Yes | 3.0 | .70 | 14 |
| | No | 3.0 | .80 | 11 |
| **Teamwork Across Teams 2** | Yes | 3.1 | .78 | 14 |
| | No | 3.0 | .89 | 11 |
| **Communication Openness 1** | Yes | 3.2 | .93 | 14 |
| | No | 3.1 | .73 | 11 |
| **Communication Openness 2** | Yes | 3.2 | .76 | 14 |
| | No | 3.4 | .65 | 11 |
| **Handoff/Transitions 1** | Yes | 2.5 | .67 | 14 |
| | No | 2.7 | .71 | 11 |
| **Handoff/Transitions 2** | Yes | 2.8 | .80 | 14 |
| | No | 2.5 | .83 | 11 |

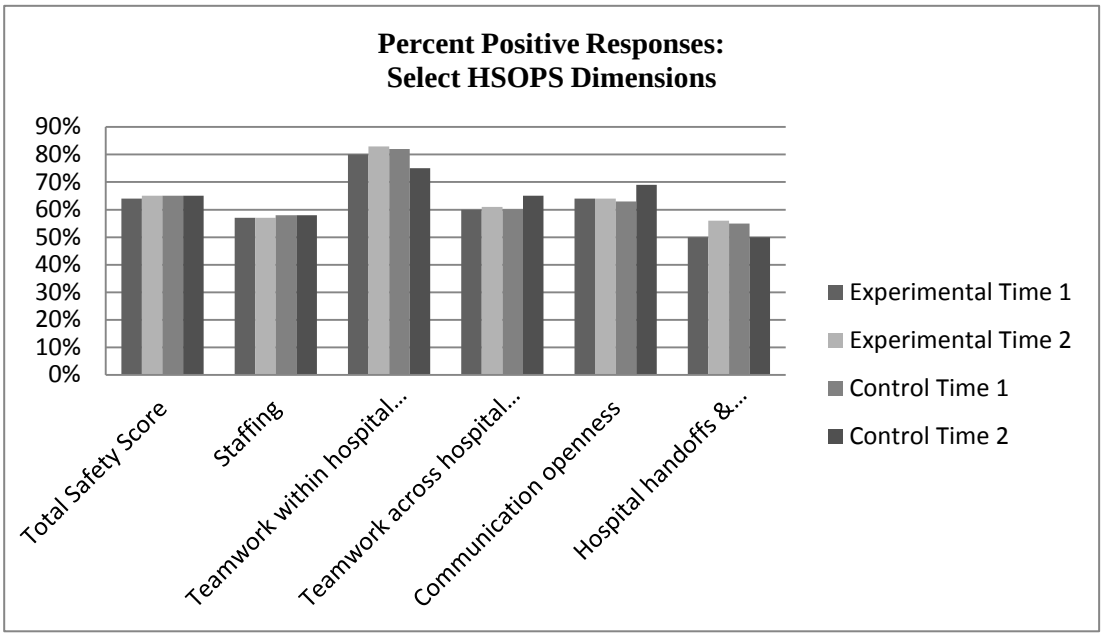



Figure 3. Percent Positive Responses on Total Safety Scores and Select HSOPS Dimensions at Time 1 and Time 2.

Survey Narrative Comments

While all participants who completed the HSOPS survey had the option to fill in the single narrative question at both Time 1 and Time 2, only control group participants provided narrative responses.

Time 1 Control Group narrative:

The summary from the Time 1 control group focused primarily on staffing issues, needing to report errors and similar issues, and the impact of more duties.

*It frequently feels like we are patching staffing together to get things done for our patients and often staff that are not adequately trained are used unsafely due to short*

*staffing. It doesn't feel like our administrators are working hard enough to get us the needed nursing and CNA staff in a timely manner.*

*I'm really happy to see co-workers and team members in the unit willing to use the rapid response so often to safe* (sic) *patient life instead until to use the code blue system. We need to do the recurrent reports related to patient fall, rapid response, code blue, patients transfer to higher level of care, medical errors, etc.*

*When asked by administration to continue to take on more and more duties, customer service for the patient and documentation of that patient go down or are not fully completed.*

Time 2 Control Group narrative:

The summary from the Time 2 survey control group surrounded stress related to lack of resources, and concerns regarding the nurse and patient relationship.

*As with most hospitals, nurses are expected to work harder with less resources and time. Due to the current financial market in my area, nurses are working harder than ever before. Patient safety is often the only thing that our nurses have time to concern themselves with. There is no longer time to actually care for our patients.*

*Nursing use (*sic) *to be a profession with many rewards and challenges. Now there are few rewards, such as the development of meaningful and trusting relationships with patients. Mostly, there are challenges. Nurses must figure out how to meet all the regulatory demands of their job while ensuring that their patients remain physically safe. The invisible parts of a nurses job such as caring and compassion are disappearing and being replaced with busy work and tasks.*

## Summary

This fifth chapter presented the findings for the study. Demographic and descriptive information was given for the 25 participants who completed the Time 1 and Time 2 surveys. Data analysis results were detailed for each of the two study hypotheses. Hypothesis one was not supported specifically, after controlling for Time 1 total safety scores, the Time 2 total safety scores for the educational intervention group were not found to be significantly different from the control group, and no other significant differences were identified. Hypothesis two was also not supported, as a statistically significant change in the mean score of select dimensions was not demonstrated between Time 1 and Time 2 for either the intervention or control group. Narrative comments from the control group at both Time 1 and Time 2 provided a depth of information regarding nursing perceptions of their practice and patient safety that cannot be found in the quantitative survey questions. Finally, the attrition rate was small and no further relationships were explored.

The sixth and final chapter will further explore these findings and their implications, as well as an evaluative summary of the education module participant evaluation.

# CHAPTER 6

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This sixth and final chapter provides an overview of the study. Study findings with literature comparisons are provided, as well as discussion of study limitations. Implications for nursing and nursing education are also highlighted and recommendations for future research provided.

## Brief Overview of Study

The purpose of this study was to evaluate the effect of an online culture of safety education intervention on nursing staff perceptions in acute care units. Demographic data were collected; the HSOPS instrument was used to measure safety perceptions. The Professional Conduct Toolkit, Module 1, was used as an educational intervention, and nurses received 3 CEUs at the end of the study. Four hospitals participated in this study, with participating nurses randomly assigned to an experimental group receiving an online education intervention between two survey times, and a control group completing the two surveys at the same time as the experimental group. The majority of the nurses in this study were from one hospital (76%), while the other nurses were from 3 other hospitals (24%). Fourteen nurses participated in the education intervention during a two-week period between the two surveys. Although neither hypothesis was supported by the findings, narrative comments from the survey, as well as the education module evaluation provided data regarding these groups of participants, and further data for future research recommendations.

The framework for the study included Donabedian's Structure-Process-Outcome framework, with demographic variables and hospital characteristics representing the

structure, the educational intervention as the process change, and the TSS and select dimension mean scores as the outcome in the study.

Review of the literature revealed numerous theories and tools which have been used to describe and measure a culture of safety, such as the HSOPS used widely in acute care hospitals (Dyer & Sorra, 2010), the PSCHO (Hartmann et al., 2009), and the SAQ (Sexton et al., 2066). These instruments have been used in descriptive one-time surveys as well as with multifaceted safety interventions (such as new charting methods, safety classes, and other methods). However, the efficacy of a single culture of safety module had not been explored.

## Discussion of the Findings

The findings of the study are interpreted in this section. First, participants' demographic information is evaluated and briefly compared to national trends in nursing demographic data. Next, the two hypotheses, and other analyses, are discussed individually with conclusions and possible explanations provided. Finally, attrition and course evaluation data are briefly described and discussed.

### Demographic Information

This section will compare the demographic information for this study's sample to the nurses in the U.S. to the extent possible, particularly in terms of education level and reported age. All 25 study participants completed a demographic questionnaire (Appendix A). Demographic findings are detailed in Table 2. The average age of participants was 49 years old, greater than the national average, but nearing the expected increased age from recent reports. The average age of registered nurses in the U.S. has continued to climb, as reported in various venues since the early 2000s (Buerhaus,

Staiger, & Auerbach, 2009; HRSA, 2010; AACN, 2012). The average age of an RN in the U.S. from the most recent report is 47 years old (HRSA, 2010), with approximately 850,000 RNs between the ages of 50-64, in the Baby Boomer generation (a third of the RN workforce) (Buerhaus, Auerbach, Staiger, & Muench, 2013). Of note in the most recent HRSA report (2010) is the fact that nurses older than 60 years of age already make up 11% of all working nurse in the U.S. Although this study's sample was small, the sample represents the average age of nurses.

The majority of participants in this study were White/Caucasian (78.6%), 17.9% reported being Asian, and 1 person reported "other". Residents in the state where the study was conducted are 77% white as of 2011 survey data (United States Census Bureau, 2012). Among U.S. RNs, approximately 5% self-identify as being Black or African American; 6% as Asian, Native Hawaiian, or Pacific Islander; 4% Hispanic or Latino; and only 0.3% as American Indian or Alaska Native (HRSA, 2010). Primarily due to this study's small sample size, the ethnicity did not align well with national averages of RNs or the general U.S. population. Lack of ethnicity representation may be due to findings from a past study that noted racial differences in perceptions of participation in medical research, with Africa-Americans less willing to participate due to not trusting research, as "some believed racial minorities bear most of the risks in medical research" (Shavers, Lynch, & Burmeister, 2002, p. 252).

There are three other demographic items for which this study's sample can be compared to the population of U.S. nurses. The female gender was over-represented in this sample at 100% of respondents. It is vital to note that male nurses had originally

volunteered among the original 87 respondents by sending their email addresses, but none of them actually completed the study.

In the U.S., while most RNs continue to be women, men were reported to be 9.6% as of 2010. This study was a small sample and although a few male nurses had first volunteered, they may not have wanted to do the study, perhaps because the hospitals required them to complete the study at home and not on work computers. The lack of male nurses' perceptions in this study may have affected the outcome regarding communication openness, for example. Hearing from a sample of male nurses would provide further information on how they view communication at work, and would allow comparison to female nurses' viewpoints.

To further consider the lack of male nurse participation in research, exploring gender bias in research and male and female views of male nurses' practice may assist with future research plans. Polit and Beck (2009) conducted a quantitative content analysis regarding gender bias in nursing research and found that, overall, "71% of participants, on average, were female, including 68% in client-focused research and 83% in nurse-focused studies (all $p < .001$)" (2009, p. 1107). Such findings support the need for nurse researchers to "pay attention to who will benefit from their research and to whether they are adequately inclusive in studying client groups about which there are knowledge gaps" (Polit & Beck, 2009, p. 1109).

A recent qualitative study explored male nurses' perceptions of their practice and noted that work stress and gender-based stereotypes contributed to job dissatisfaction, while patient care and making a difference were personal rewards and the main reasons to stay in the profession (Rajacich, Kane, Williston, & Cameron, 2013). Exploring how to

help them understand how participation in research will make a difference may provide rationale for more male nurses to participate in research.

A previous descriptive study regarding acceptance of male nurses by female nurses noted no difference between urban and rural nurses' acceptance, however, rural nurses were less likely than urban nurses to believe that female nurses are ready to accept a larger number of male nurses into the profession (McMillian, Morgan, & Ament, 2006). While the hospitals in this study were not rural, in one hospital region some staff reside in small towns or in rural areas. With these study findings, and the current study's lack of male participants, it would be essential to add information to the recruitment handout that both male and female nurses are needed in the study to hear both male and female voices regarding their perceptions of their work environment.

Nurses with graduate (n=6) or bachelor's degrees (n=14) were overrepresented in this study's sample, while associate degree nurses (n=5) and diploma nurses (none) were underrepresented. According to the latest national HRSA brief on RN practice and education levels (HRSA, 2013), the majority of RNs in the U.S. hold a bachelor degree (55%), with the remainder holding an associate degree or a diploma. More nurses (13%) have received graduate degrees in the past five years.

There could be several reasons for the BSN and graduate nurses being 80% in this small study sample. First, a recent study found that nurses with higher levels of education demonstrated higher self-efficacy with online education (Larsen & Zahner, 2011). In addition, inadequate information literacy is a barrier to web-based modules that some students have faced when attempting web-based discussions or expression of ideas (Fernandez-Aleman et al., 2011). Finally, nurses with a higher level of education may

have a greater appreciation for research and see the importance of taking part in research more than those with less formal education (Smith & Brasch, 2012). Therefore, more familiarity and self-efficacy with online processes may have accounted for the higher level educated nurses signing up and taking part in the entire study. And lastly, associate degree and diploma nurses may have been underrepresented and uninterested in volunteering for this study because the study involved entirely online education and online surveys.

The final demographic item for which participants in this study can be compared to the general nursing population is the number of years in practice. Individuals in this study's sample who completed the study reported 9 mean years of nursing practice (Range: 1-16 years). These findings are fairly consistent with the general nursing population, with 72.2% of nurses in the U.S. reported to have worked 10-16 years (HRSA, 2010).

The question regarding "previous safety training" was an additional demographic item added for this study. No significant relationship was found between previous safety training and the groups' safety scores. A literature search yielded no previous studies to compare this item with. Culture of safety training programs are becoming more common in acute care settings and in nursing programs implementing QSEN. As more nurses and nursing students receive Culture of Safety training, the simple yes/no question on previous training may become irrelevant.

Hypothesis One

Hypothesis one stated there would be a statistically significant positive change in the total safety score of the intervention group, as compared to the control group, between

Time 1 and Time 2. The analysis of the t-tests showed no significance difference between Time 1 and Time 2 for the intervention or control groups' TSS mean scores.

This small sample-size study therefore did not confirm that an online safety education module can increase the perceptions of safety. Nor can it be demonstrated that this module indirectly increased their culture of safety awareness (knowledge), sensitivity (attitude), and competence behaviors (skills and actions), an important KSA to the Quality and Safety Education for Nurses (QSEN) program. However, the data showed Teamwork within Units was at a high level in this study, which QSEN has identified as necessary skills for competence team behaviors with students and nursing staff.

In consensus with the findings of this study, several previous studies reported similar outcomes from either one-time survey submission (non-interventional) or from interventional studies. First, the non-interventional studies' outcomes will be compared to the Time 1 scores in this current study, and then compared to interventional studies.

Past studies with the HSOPS instrument have reported the mean total safety score (TSS), which is similar to a safety grade of the agency that was used for the survey. The current study's baseline (Time 1) mean Total Safety Score is compared to seven non-interventional descriptive studies for those who also reported the score. The overall mean TSS in this current study was 65%, which is higher than 44% reported by Bodur and Feliz in Turkey (2010), 51% reported by Halbesleben et al. (2008) in a Veteran's Administration hospital, 59% reported by Scherer and Fitzpatrick in an operative unit (2008), and 53% reported in a recent study in Japan (Fujita et al., 2013). The overall mean TSS is the same as 65% reported recently in 20 hospitals in the Netherlands (Smits et al., 2012), but considerably lower than75% reported by El-Jardali, Dimassi, Jamal,

Jaafar, and Hemadeh in Lebanon (2011), and 76% reported by Chen and Li in Taiwan (2010). None of these descriptive studies seemed to explore why their scores were either low or high as compared to past studies.

It would be interesting to be able to compare pre and post TSS scores from the current study to these 7 studies if they had also done a post-change survey. However, these studies were only descriptive studies conducted primarily to report the baseline characteristics of a patient safety culture within their own region, as discussed by several authors (Fujita et al., 2013; Bodur & Feliz, 2010; and El-Jardali et al., 2011). Each study can compare their own TSS score to the AHRQ benchmark score of 61%. The fairly wide range of TSS mean scores (51% to 76%) from these studies suggests that the sample demographics may influence the scores, as well as the country or region where the study was conducted, due to a wide variety of countries compared. The influence of the study region needs to be explored and reported further in future studies. The mean of 65% in this study suggests also that the small sample of nursing staff within this Western U.S. state seemed mostly positive about their work environment's overall safety. This overall positive score may also be related to positive changes in staff and patient safety that have become a main focus in all U.S. hospitals since the JCAHO guidelines changed in 2009. The fact that most of the participants in this study had received some type of culture of safety education before this study indicates that these hospitals may have already begun integrating safety in work areas.

The TSS score was reported in three interventional studies. The TSS was reported as 60% at year one and significantly improved to 80% at year 3 in a long-term study that involved team workgroups, educational classes, and changes in report methods (Mayer et

al., 2011). The overall safety score remained unchanged over two years (54% at Time 1 and at Time 2) in a multi-faceted interventional study (Adams-Pizarro et al., 2008), and significantly improved from baseline (38%) to post-intervention one year later (59%) in a study that involved live education classes and a report tool change to SBAR (Andreoli et al., 2010). While the TSS scores did not change significantly in this current study with 3 weeks between the Time 1 and Time 2, it also is difficult to know if the actual intervention done in the three studies above did or did not change the TSS means. This was reported by authors of the 3-year study (Mayer et al., 2011) and the 1-year study (Andreoli et al., 2010) as a limitation of their intervention studies. In other words, there was no way to clearly identify what else might also have influenced the mean TSS between year 1 and year 3.

Hypothesis Two

Hypothesis two stated that there would be a statistically significant change on the mean difference of select safety dimension scores, such as teamwork, communication, and staffing, in the intervention group at Time 1 and Time 2. The repeated measures ANOVA was conducted on the select dimensions at Time 1 and Time 2 with both groups, using the educational intervention (IV) as a covariate. As discussed in the previous chapter, no significant difference was noted between or within the groups at Time 1 or Time 2, on these select dimensions. While mean scores varied slightly in several key dimensions, none of these variations were significant. However, it is interesting to compare this study's findings to other HSOPS survey studies. Select dimensions from non-interventional studies will be noted first, and then the select dimensions mean scores from intervention studies.

Several non-interventional descriptive studies have mentioned HSOPS select dimension mean scores, which will be compared to findings from this current study's Time 1 dimension scores. In the previous studies that described the HSOPS dimensions, staffing was the lowest mean score reported, with 37% (Fujita et al., 2013), 39% (Chen & Li, 2010), 44% (Bodur & Feliz, 2010), and 56% (Scherer & Fitzpatrick, 2008).

In two intervention studies staffing was also low and reported as 47% pre and 45% post (Adams-Pizarro et al., 2008) and 40% pre and greatly improved to 56% post (Andreoli et al., 2010). The staffing overall mean was 57% in the current study, which is higher than previous reports. Staffing levels have been reported as a continuing issue where a ratio of RN to patients has not yet been integrated. Short staffing is a critical concern as a number of studies link staffing levels to safe client care (AACN, 2010). Nurses have become concerned that staffing in their agencies is not adequate to ensure client safety, or to allow them to provide the level of care that they value. California is the only state that has enacted legislation mandating explicit nurse-to-client ratios in hospitals and other health-care settings (Schultz, 2013). While the current study staffing mean score was higher than past studies, the level is still a low score overall (57%), which indicates the hospitals studied in this state seem to continue to try to manage appropriate staffing needs.

Teamwork is another important dimension of hospital safety, with past and recent descriptive studies reporting teamwork within units as 70% (Bodur & Feliz, 2010; Fujita et al., 2013), and 75% (Scherer & Fitzpatrick, 2008). In the current study the overall mean was 80%. The pre and post teamwork within units scores in this study were 80% pre and 83% post (intervention group) and 82% pre and 75% post (control group).

Large-scale interventional studies have reported 76% pre and 77% post in teamwork within units (Adams-Pizarro et al., 2008), and 70% pre-intervention and 86% post intervention in the 3-year study (Mayer et al., 2011). It is unclear what caused the drop in this study's control group mean score at Time 2 and no further exploration was done due to the small sample size of this group (11 nurses) spread across multiple units.

Demographic differences may cause variance in the within-team mean scores; however, the reported means are overall higher than teamwork across teams. Therefore, staff who work together in the same unit day after day seem to support one another appropriately, as demonstrated by the mean scores at 70% or higher.

Teamwork across units continues to be reported less positively than teamwork within units in some studies: 40% (Bodur & Feliz, 2010), and 44% (Fujita et al., 2013). A study in Taiwan reported 94% (Chen & Li, 2010), while the overall mean for teamwork across units was only 61% in the current study. In the interventional studies, the scores were reported as 63% pre and 79% post (Andreoli et al., 2010), and 47% pre and 45% post (Adams-Pizarro et al., 2008). The pre and post scores in this study were 60% pre and 61% post (intervention group) and 60% pre and 65% post (control group). These small changes in the mean scores suggest something other than the education module influenced the participants, and that the scores were already higher at baseline than reported in previous studies.

With both low mean scores reported (40% and 44%) as well as higher scores, it would be important to report the processes that are working well between units (particularly with a 94% score), as well as processes that are not working. The main nursing sample in this current study was from a 400-bed religious-based hospital, with a

management group who seemed to get along well, and with some managers responsible for more than one nursing unit. In addition, this management team required use of processes that support patient safety (such as SBAR report processes and bedside report) and an expectation that staff will float to another unit as needed due to variation in the census. SBAR (a template to report patient transfers between units) was implemented in the study that reported a 79% mean score after the intervention (Andreoli et al., 2010). The wide variation in reported teamwork across units mean scores suggests further work is needed within hospital units to understand how to support each other as well as using clear communication regarding patient care.

Communication openness has been reported in the descriptive studies as 38% (Bodur & Feliz, 2010), 58% (Chen & Li, 2010), 68% (Scherer & Fitzpatrick, 2008), and 65% overall in the current study. In the intervention studies, communication openness was reported as 60% pre and 59% post (Adams-Pizarro et al., 2008), 42% pre and 54% post (Andreoli et al., 2010), and as 60% baseline and 76% at year 3 of a longitudinal study (Mayer et al., 2011). In this current study, the communication openness mean scores were unchanged at Time 1 and 2 in the intervention group (64%) and increased from 63% to 69% in the control group.

Once more, due to the small sample in this study, there is no clear explanation as to why the control group mean score changed while the intervention group score did not. And, the range of mean scores from current studies (38% to 76%) suggests that communication openness scores may vary due to demographic differences in a study sample as well as the agency demographics.

Clear communication is a skill nurses are taught in most education programs, but in some agencies this may be limited by time pressures, a nurse's fear of retribution if they report an issue or unit problem, or a unit's norms of staying silent when someone demonstrates lateral violence (Pauly et al., 2009; Rice et al., 2008; Whitworth, 2008). The variation in scores suggests there are some barriers to clear communication in practice areas. It has been proposed that work stress affects appropriate communication for some nursing staff (Riahi, 2011).

Lastly, "handoffs and transitions" mean scores were compared to previous works. In this study, handoffs had a mean of 50% at Time 1 and 56% at Time 2 for the intervention group, and 55% at Time 1 and 50% at Time 2 for the control group. These mean scores are much lower than a recent descriptive study that reported a mean of 68% (Smits et al., 2012), but similar to 54% reported by Bodur and Feliz (2010), and higher than 35% reported by Fujita et al. (2013). The intervention studies reported lower scores with 43% pre and 41% post (Adams-Pizarro et al., 2008) and 30% pre and 57% post (Andreoli et al., 2010), and was not reported in the 3-year study (Mayer et al., 2011).

Bedside handoff has become a recent method for nursing report, with findings showing this promotes patient safety (Maxson, Derby, Wrobleski, & Foss 2012). In a recent study, patient handoff methods were explored with a convenience sample, with 84% of participants preferring verbal communication for patient handoffs (Benham-Hutchins, & Effken, 2010). Many of the participants in this current study were already using an SBAR report format (used primarily verbally) so they were already working on appropriate methods for handoffs. With this understood, higher mean scores may have been expected; however, it is not known if all units were using SBAR or similar methods

when the study was conducted. Also, regardless of processes in place for handoffs, the nursing staff may still have a personal perception that handoffs are not always managed appropriately (Maxson et al., 2012).

Course Evaluation Findings

Participants in the intervention group were asked to complete one open-ended question and 9 Likert-type scale course evaluation questions designed by the researcher in collaboration with one of the participating hospitals' education departments. See Appendix B for a full list of the questions and related responses. Fourteen participants completed the course evaluation.

The first question was open-ended and asked what they hoped to learn from the online course, with comments primarily focused on learning how to build a positive team, how to manage work conflict, and methods of addressing horizontal violence in healthcare. The first Likert-scale question (question 2) focused on how their expectations were met by this course, with 95% of respondents stating they were met or exceeded. Question 3 asked them how informative the information on unprofessional behavior was, with 50% of respondents finding this information "some" or "very much" helpful. Question 4 asked them how informative the information on the defining characteristics of horizontal violence and bullying was to them, with 60% finding it somewhat or very informative. Question 5 asked them to rate the videos on unprofessional behavior and bullying with 55% of respondents agreeing that the videos demonstrating horizontal violence and bullying were "very informative". It is important to note that the videos showed mostly female managers and nurses which would influence how male or female staff view these demonstrations.

Question 6 asked how informative the section on enforcement and engagement was to them, and 50% said it was very informative. Question 7 asked them if they agreed the module would assist them in managing unprofessional behavior, with 80% stating they somewhat agreed. Question 8 asked if they agreed the module provided strategies for promoting the "engagement" collaborative process in the workplace, with 50% saying they somewhat agreed. Question 9 asked if they agreed that the module increased their awareness of the influence of unprofessional conduct on patient errors, negative patient outcomes, and staff dissatisfaction, with 65% strongly agreeing. Lastly, question 10 asked about the length of the module with 70% agreeing that the module was the appropriate length. Unfortunately, there are no previous culture of safety studies against which to judge this finding, as no previous work has utilized a single online module as an educational intervention with pre and post surveys. It is clear from the evaluation that not all participants in the small sample (n=14) found every part of the module informative. For example, if only 50% (7) agreed that the strategies for engagement were appropriate in the online module, there would be a need to change how this is presented or taught. Therefore, using this feedback will assist on future culture of safety education, either face to face (to allow discussion of the main topics), or online, with further information or methods to teach and present the topics within the module.

Attrition Findings

This study had initially a substantial overall attrition rate of 63% (from 87 to 32 respondents) and rates of 17% and 26% after having done the Time 1 survey from the intervention and control groups respectively. It is unclear why the males dropped out, however, the lack of perception of the 3 free CEUs as a "personal reward" may have

influenced their participation (Rajacich et al., 2013). Also, horizontal violence, which is discussed within a culture of safety, has often been demonstrated as a problem between female nurses in articles, videos, and other literature (Weinand, 2010; Smith, 2011). This may influence male nurses' views of this topic, and their willingness to take part in a study surrounding this issue.

Few previous studies were identified which explored the relationship between demographic variables such as education level, and attrition from online education courses (Larsen & Zahner, 2011; Fernandez-Alemen et al., 2011). In this current study, there was no statistical significance in the education level noted from the 7 staff that dropped out of the study after the first survey. Of those who dropped out, 2 reported associate degrees, 3 reported a BSN, and 2 reported having a graduate degree. Therefore, the sample size was too small to detect a difference.

In this current study the fact so many dropped out after they first volunteered, and after they received the information email, may be due to the need to complete the entire study at home, on their own time. The agencies did not approve using computers at work for an hour, or when the unit was quiet, and staff may have felt doing a culture of safety study at home was a work-related issue, not a personal issue to focus upon. It was clear from the manager meetings that staff would need to volunteer and not do any of the study at work. At one hospital, the leader said, "Even though this topic is important to us, and we hope to integrate your module here after your study is over, we are not going to pay our staff to be in your study." While the 3 free CEUs were offered as an option for recruitment and completing the entire study, this did not seem to prevent attrition.

Along with other options for volunteering, attrition has been explored in randomized control studies, which we can learn from quasi-experimental studies (Hewitt, Kumaravel, Dumville, &Torgerson, 2010). In addition, attrition from longitudinal studies has been explored which can also assist on future pre and post quasi-experimental studies (David, Alati, Ware, &Kinner, 2013).

Study Limitations

As with any research study, this study is not without limitations. Several limitations related to the sampling method were noted. Other limitations related to inclusion criteria, timing, attrition, and lack of participation were also noted. Each of these will be discussed further.

One of the major limitations which impacts generalizability of study findings is related to the use of a non-probability sample limited to nursing staff volunteers from four acute care hospitals in one state. Another limitation was that while the desired sample was deemed accessible to the researcher, the lack of voluntary participation impacted the study outcomes. The technological inclusion criteria were another limitation impacting generalizability. As the study was conducted solely in an online environment, participation was limited to those with existing internet skills and access to specific equipment. It is improbable that all nurses have sufficient access to a computer with speakers and high-speed internet, and some may lack basic computer skills. Therefore, these requirements for participation in the online study environment limit the ability to generalize findings to all acute care staff nurses.

Another limitation is that the study was conducted during specific time periods. The study surveys and education module ran over a four-week period with each group of

participants. These periods encompassed holidays that included Labor Day, Valentine's Day, Saint Patrick's Day and Easter. This time of year was also inclusive of spring break for many students and the end of the semester for many universities, which may have impacted participants.

In addition, the high attrition rate is of concern. While 87 individuals submitted informed consent to participate, only 32 completed the Time 1 survey and 25 participants completed the entire study. Attrition was not formally explored between those who completed the Time 1 survey and completed the entire study. However, high attrition in this study impacts both the study findings and generalizability.

There is an ongoing debate in the literature concerning whether it is suitable to use a quantitative questionnaire to measure a complex psychological construct like a culture of safety (Hartman et al., 2008; Smits et al., 2012). Although hundreds of acute care agencies have utilized the quantitative HSOPS instrument with data to compare their findings, it may be more appropriate to have this type of survey accompanied by qualitative methods, such as interviewing and observation (Smits et al., 2012). Qualitative methods may provide richer data regarding nurses' perceptions of safety as well as sensitivity to the issues nurses may be facing in a particular hospital.

A final potential explanation and limitation for this study's small sample is related to working within a stressful environment that nurses may perceive does not enable participation in further matters related to their work (Johnston, Jones, Charles, McCann, & McKee, 2013; Riahi, 2011). A recent study found that a nurse's negative affect was highest at periods of high demand/effort, low control and low reward (Johnston et al., 2013). Perhaps the silence, related to a negative affect and measured by a lack of participant

volunteers as wells as immediate attrition from the 87 nursing volunteers to a much smaller total sample, is related to a sense that even free CEUs was not enough reward to take part in research related to their work environment.

Although the hospital administration at each site was supportive of the study topic, there was no incentive to participate on the part of the employers. For example, no employer agreed to compensate even one hour to staff to participate, nor approve access to use the computers at work during slower times to take part in the study. In addition, although the managers at one hospital liked the idea of providing a certificate for free coffee to those who participated, the nursing leader did not approve this idea.

Each of the above limitations could potentially decrease the representativeness of the sample, therefore limiting the ability to generalize study findings to all acute care nurses. These limitations have led to the following recommendations for future research.

Recommendations for Nursing and Nursing Education

The findings of this study, although not statistically significant, have resulted in several concepts important to nursing and nursing education. These findings have led to several recommendations which will be described in the following paragraphs.

The TSS for the intervention group was already considerably higher at Time 1 and Time 2 than the national AHRQ benchmark mean of 61%. With a mean TSS at this high level, the single education module may have been unable to further influence the nurses' perceptions. Therefore, these findings suggest it would be critical to conduct a baseline survey with the HSOPS tool in hospital studies to check the initial level prior to further interventions, as a means to not misuse patient and staff safety budgets. In addition, the more complex or multi-focused educational interventions reported in the literature may

not be more effective than a single module and are likely more expensive due to trainer and staff time requirements, and the necessity for a budget to manage complex safety education programs.

There is not yet a way to compare online to live safety education. However, further research on an online safety module will provide additional information on the influence of this type of method, as well as the cost to use this in hospitals. Hospital managers facing financial constraints not only in departmental budgets but in staff hours would find a simpler education module less costly to support the ongoing development of a culture of safety work environment. Also, the budget would need to consider the cost of software to run an online education intervention. The current healthcare system in the U.S. continues to have sharply rising costs (Kavanagh, Cimiotti, Abusalem, & Coty, 2012). Such costs influence the budgetary decisions made by unit managers as well as nursing education departments. Nursing educators charged with safety education for nursing staff should consider further utilizing a single online module that can be provided with asynchronous delivery methods. Such methods provide learner convenience, and less instructor oversight than a live method (Bernal, 2010). A recent study found that web-based nursing education was more positive regarding knowledge acquisition, retention, and skill performance as compared to conventional teaching (Du et al., 2013). If the nurses do not demonstrate the technological skills necessary to be successful in online education, they may need to be taught computer-based online skills (Fernandez-Aleman et al., 2011).

This study did not reveal any relationship between previous culture of safety training and TSS scores. However, it may be important to continue to collect this information in

large-sized sample studies to then compare this variable to the other dimensions or total safety score to see if there is any relationship. Adding a qualitative type of question regarding "What did you learn in your past safety training?" would assist in this type of analysis. This information would perhaps answer if past training influences the staff perceptions, or perhaps demonstrate that they no longer remember what they were taught during their past safety training, or that the past training made no difference.

In addition, baseline data in future studies would provide evidence for further interventions that may be appropriate for different types of groups (e.g., staff versus manager groups). Further exploration is needed to discover education methods that may be delivered in appropriate and creative ways to foster staff engagement surrounding a safety culture. Depending on the staff and their access to technical equipment and software, it may be important to offer either a safety education module in live, face-to-face seminars or workshops, or in an online environment. In addition, exploring what the nursing staff themselves want to learn surrounding safety and what they see as the best method would assist with annual updates as well as new employee orientation.

Staffing, communication openness, and handoffs continue to be concerns in recent HSOPS studies. Communication openness and nursing care handoffs continue to be a focus of studies as a way to increase patient safety (Kaplow, 2013; Maxson, Derby, Wrobleski, & Foss, 2012; Dodek et al., 2012). Therefore, it is important for nursing managers and nursing educators to discuss these concerns with staff and nursing students, to further understand the effect of these dimensions on patient safety. QSEN provides topics to use for discussion of safety issues with students, and such tools may also work with practicing staff. In addition, asking staff nurses to share with their peers a patient

scenario that influenced their view of patient safety or communication and how they managed the resultant issues can help others learn from their expertise. During annual skills days where nurses practice critical skills, adding safety scenarios to discuss, or practicing handoffs (such as with the SBAR format) would provide a baseline level of these skills for employees and a benchmark to reach for safety skills.

Lastly, with staffing continuing as a low positive score in the HSOPS studies, and the fact that nurse to patient ratios continue to be considered for patient safety (Shekelle, 2013), management teams must use clear communication when discussing their staffing methods. Any process that helps nursing staff understand why a nurse has 6 patients on medical-surgical units and 4-5 patients on telemetry can prevent further frustration surrounding staffing ratios. Appropriate staffing is also socially relevant to the situation, as even in the one state (California) where there has been a ratio law for nearly 8 years, nursing staff still report "staffing issues" (Schulz, 2013). Therefore, it is important for nursing education and nursing leaders to understand what nursing staff mean when they report "we don't have enough staff."

Recommendations for Nursing and Nursing Education

While this study had a small sample, the feedback on the online education module demonstrated this is an innovation in reaching out to nursing staff. Most of the intervention group agreed that the module provided new information, and that some felt they learned further skills to manage inappropriate behavior. Also, the narrative comments provided by the control group from the open-ended survey question demonstrated that they perceive a high level of stress and lack of time in their practice to prevent errors, and feel the administrative leaders were expecting them to work faster and

harder than they had before. This information provides data that the issues surrounding safety continue to be a vital concern in nursing practice, and further research that will assist in understanding the best methods to integrate a culture of safety in nursing practice.

Recommendations for future research include:

1. Replicate the study using a larger probability sample size of acute care nurses in multiple hospitals or additional states to enhance ability to generalize findings to all acute care nurses in the U.S.
2. Conduct a study exploring the total safety scores between those who participate in face-to-face versus an online environment.
3. Conduct a quasi-experimental study with hard copy HSOPS surveys for hospital nursing staff, to explore whether this provides more staff participation.
4. Explore the issue of the silent "no" decision made by those who did not volunteer for this study as well as those who volunteered and then did not complete the entire study, with a qualitative approach such as face-to-face interviews.
5. Explore recruitment and study completion options with the appropriate hospital management team, such as free coffee tickets, or use of the unit's computers as long as the unit is not too busy.
6. Execute the study at a different time of year to explore the effect time of year has on attrition.
7. Modify the demographic question regarding highest level of education completed to include doctorate level education, thus better aligning with current nursing degrees. This

could influence future research findings about the relationship between highest level of education completed and culture of safety, particularly in larger samples.

8. Increase various ethnicities participation in future nursing staff HSOPS studies, in order to compare perceptions across ethnic groups for culture of safety research to prevent bias of safety culture findings (Zhivan, Ang, Amaro, Vega, & Markides, 2012). Currently, experts suggest the need to identify effective recruitment and retention strategies of Latinos in the U.S. for research studies (Reidy, Orpinas, & Davis, 2012). A past study noted racial differences in perceptions of participation in medical research, with Africa-Americans less willing to participate as not trusting research, as "some believed racial minorities bear most of the risks in medical research" (Shavers, Lynch, & Burmeister, 2002, p. 252). In future survey studies, it would be vital to assure the consent is appropriate for all participants to read clearly and that the study needs all ethnicities to take part, as well as assuring them that their privacy will not be violated, and no inappropriate risks will be allowed within a survey study.

## Summary

This final chapter presented a summary of the study and its findings. Minor findings noted that "staffing," "communication openness," and "handoffs" continue to be issues in acute care units. Major findings demonstrated overall that further research is necessary to explore the influence of an education module on nursing perceptions of their work environment. Further research with a larger sample could provide data that are more conclusive. The HSOPS has been confirmed to measure group culture and not just individual attitudes (Smits et al., 2009). Larger sample sizes would provide appropriate generalizability of findings. In addition, results of such work and related improvement

efforts should be directed to the appropriate level, such as the nursing unit and not toward individuals, unless conducted as part of the nursing departments' annual skills days, for example. Also, plans for improvement based upon study outcomes may be best maximized if interventions focus on areas needing the most improvement, such as communication and handoffs.

Employers are expected to support a culture of safety by providing programs for employees and making culture of safety a priority, according to Joint Commission mandates (2009). Research that results in appropriate education methods to support the nursing practice environment to meet the Joint Commission mandates can assist on further collaboration between nursing education and practice, and ultimately improve the work environment of all nurses. In addition, an organizational commitment to developing and maintaining a culture of safety is important to engage staff in safety processes.

In summary, assuring patient safety continues to be a central focus of nursing practice and education. Current research makes it increasingly clear that what occurs in the surrounding health care environment impacts both staff and patient safety. The protracted nursing shortage and nurse turnover may adversely affect patient outcomes and are exacerbated by an environment of disruptive behavior, conflict, and poor communication in the nursing workplace. The Joint Commission has identified these behaviors as key elements that jeopardize the "culture of safety" necessary to assure safe, quality patient outcomes (2009). Further research on staff perceptions of their work environment, and how to improve that environment, will provide evidence that can help foster continued growth in a culture of safety.

APPENDIX A

**SECTION H: Background Information**

**This information will help in the analysis of the survey results.**

**1. What is your gender?**

☐ a. female ☐ b. male

**2. What is your age?**

☐ a. 19 – 23 years
☐ b. 24 – 28 years
☐ c. 29 – 33 years
☐ d. 34 – 43 years
☐ e. 44 – 53 years
☐ f. 54 – 63
☐ g. 64 - 73
☐ h. Over 73 years

**3. What is your ethnicity?**

☐ a. white
☐ b. black
☐ c. Hispanic
☐ d. Asian
☐ e. other

**4. What is your highest level of education completed?**

☐ a. Diploma
☐ b. Associate degree
☐ c. Bachelor's degree
☐ d. Graduate or professional degree

**5. How long have you worked in this hospital?**

☐ a. Less than 1 month
☐ b. Less than 1 year
☐ c. 1 to 5 years
☐ d. 6 to 10 years
☐ e. 11 to 15 years
☐ f. 16 years or more

**6. How long have you been a nurse?**

☐ a. Less than 1 year
☐ b. 1 to3 years
☐ c. 4 to 6 years
☐ d. 7 to 10 years
☐ e. 11 to 15 years
☐ f. 16 years or more

**7. Have you completed any previous culture of safety education or training?**

☐ a. No ☐ b. Yes

# APPENDIX B

Professional Conduct Education Module evaluation by participants. N=14.

1. When I volunteered for this online course, what I hoped to learn was:
   Comments were primarily focused on learning how to build a positive team, manage work conflict, and methods of addressing horizontal violence in healthcare.

2. Your expectations for this course were:
   95% of respondents said they were "met or exceeded".

3. Please indicate how informative the part of the course about *Information on the Impact of Unprofessional Conduct was to you.*
   50% of respondents said "some" to "very much".

4. Please indicate how informative the part of the course about *Defining Characteristics of Horizontal Violence and Bullying was to you.*
   60% of respondents said this was "somewhat" to "very informative."

5. Please indicate how informative the part of the course about *Videos Demonstrating Horizontal Violence and Bullying was to you.*
   55% of respondents said "very informative."

6. Please indicate how informative the part of the course about *Information on Enforcement and Engagement* was to you.
   50% of respondents said this was "very informative."

7. Please state your level of agreement with the statement below:
   This online module will enable me to apply the knowledge and skills that prevent horizontal violence and bullying in the workplace.
   80% of respondents said they somewhat agreed.

8. Please state your level of agreement with the statement below:
   This online module provided strategies for promoting the "engagement" collaborative process in the workplace.
   50% of respondents said they somewhat agreed.

9. Please state your level of agreement with the statement below:
   This online module increased my awareness of the influence of unprofessional conduct on patient errors, negative patient outcomes, and staff dissatisfaction.
   65% "strongly agreed" with this.

10. Please state your level of agreement with the statement below:
    This online module was the appropriate length for the topics covered.
    70% "somewhat" to "strongly agreed" with the length.

# APPENDIX C

**Group Statistics**

| | Ed_Intervention | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| TSS1 | Yes | 14 | 3.2973 | .18725 | .05004 |
| | No | 11 | 3.2822 | .27979 | .08436 |
| TSS2 | Yes | 14 | 3.2060 | .21684 | .05795 |
| | No | 11 | 3.2822 | .27979 | .08436 |

Independent T-Test Group Statistics

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| TSS1 | Equal variances assumed | 1.724 | .202 | .162 | 23 | .873 | .01515 | .09350 | -.17827 | .20857 |
| | Equal variances not assumed | | | .154 | 16.687 | .879 | .01515 | .09809 | -.19209 | .22239 |
| TSS2 | Equal variances assumed | .708 | .409 | -.769 | 23 | .450 | -.07624 | .09919 | -.28144 | .12895 |
| | Equal variances not assumed | | | -.745 | 18.497 | .466 | -.07624 | .10235 | -.29086 | .13837 |

Independent T-test of TSS Group Means

# APPENDIX D

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | TSS1 | 3.2907 | 25 | .22731 | .04546 |
| | TSS2 | 3.2395 | 25 | .24409 | .04882 |

Paired Samples T-Test Statistics

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | TSS1 & TSS2 | 25 | .465 | .019 |

Paired Samples Correlation

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | TSS1 - TSS2 | .05118 | .24430 | .04886 | -.04966 | .15202 | 1.048 | 24 | .305 |

**Paired Sample T-Test TSS Group Means**

APPENDIX E

# Biomedical IRB – Expedited Review

# Approval Notice

***NOTICE TO ALL RESEARCHERS:***

*Please be aware that a protocol violation (e.g., failure to submit a modification for any change) of an IRB approved protocol may result in mandatory remedial education, additional audits, re-consenting subjects, researcher probation, suspension of any research protocol at issue, suspension of additional existing research protocols, invalidation of all research conducted under the research protocol at issue, and further appropriate consequences as determined by the IRB and the Institutional Officer.*

**DATE:** June 29, 2012
**TO:** **Dr. Lori Candela**, School of Nursing
**FROM:** Office of Research Integrity - Human Subjects
**RE:** Notification of IRB Action
Protocol Title: **Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Nursing Staff in Acute Care Nursing Units**
Protocol #: 1205-4156M
Expiration Date: June 28, 2013

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This memorandum is notification that the project referenced above has been reviewed and approved by the UNLV Biomedical Institutional Review Board (IRB) as indicated in Federal regulatory statutes 45 CFR 46 and UNLV Human Research Policies and Procedures.
The protocol is approved for a period of one year and expires June 28, 2013. If the above-referenced project has not been completed by this date you must request renewal by submitting a Continuing Review Request form 30 days before the expiration date.
**PLEASE NOTE:**
Upon approval, the research team is responsible for conducting the research as stated in the protocol most recently reviewed and approved by the IRB, which shall include using the most recently submitted Informed Consent/Assent forms and recruitment materials. The official versions of these forms are indicated by footer which contains approval and expiration dates.
Should there be *any* change to the protocol, it will be necessary to submit a **Modification Form** through ORI - Human Subjects. No changes may be made to the existing protocol until modifications have been approved by the IRB. Modified versions of protocol materials must be used upon review and approval.
Unanticipated problems, deviations to protocols, and adverse events must be reported to the ORI – HS within 10 days of occurrence.
If you have questions or require any assistance, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 895-2794.

APPENDIX F

# INFORMED CONSENT
## Department of: School of Nursing

**TITLE OF STUDY:** Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units.
**INVESTIGATOR(S): Dr. Lori Candela (PI), Cynthia Parkman, Doctoral student researcher**
**CONTACT PHONE NUMBER: 707-365-6159 (Doctoral student researcher), 702-895-2442 (PI).**

**Purpose of the Study**

You are invited to participate in a research study. The purpose of this study is to explore the influence of an online educational intervention on nursing staff perceptions of a culture of safety. In addition, this study will add to our understanding of the efficacy and value of using the Department of Defense "Professional Conduct" (2010) online toolkit as an educational intervention in influencing nurses' perceptions of safety, and promoting safe patient care.

**Participants**

You are being asked to participate in this study because you fit this criteria: 1. You are a Registered Nurse currently employed as a staff nurse on one of the nine adult acute care units, including intensive care, or in the emergency department; 2. You have worked on your respective unit for at least one month, whether Full-time, Part-time, or Per Diem status; 3. You have an identification and password to log into *Healthstream* which is your agency's online education site; and, 4. You have personal email, access to a computer with internet capability, as well as Windows media player and PowerPoint.

**Procedures**

If you volunteer to participate in this study, you will be asked to do the following:
If you agree to participate in the study, you will click to the next page to begin the demographic questions and the survey. You will complete the same online survey at two different times, and the dates for these surveys will be provided to you.
Participants will be placed in either the intervention or the control group.
If you are in the intervention group, you will have one week to complete the first survey and the student researcher will send an email reminder to you early in the first week.
After the first survey, you will be assigned to do an online education module. You will receive information via email about how and when to access the online module via Healthstream. You will log into Healthstream with your usual ID and password to do the online module. Only those nurses assigned to the module will be able to see the module when they sign in. You will complete the online module during the two weeks during this study that the module is available, which you can expect to do during the 2 weeks right after the first survey is done. You will receive a reminder email to complete the education module during the first week it is available.

Participant Initials _____

***Approved by the UNLV IRB. Protocol #1205-4156M***
***Received: 06-13-12 Approved: 06-29-12 Expiration: 06-28-13***2

**TITLE OF STUDY:** Evaluation of an Educational Intervention on Perceptions of a Patient Safety Culture Among staff in Acute Care Nursing Units.

You will complete the online survey a second time at week 4. You will have one week to complete the second survey and the student researcher will send an email reminder to you early in that week.
If you are in the control group, you will have one week to complete the first survey and the student researcher will send an email reminder to you early in the first week. You will complete the online survey a second time at week 4. You will have one week to complete the second survey and the student researcher will send an email reminder to you early in that week. You will have the option to access the online module at the end of this study. You will log into Healthstream with your usual ID and password to do the online module. Only those nurses assigned to the module will be able to see the module when they sign in.
Upon completion of the study, if you did both surveys and also the education module, you will receive a CEU certificate via email from the student researcher.
It is important that *no matter which group you are in* we would like you to *not talk with anyone* about the study and the content during this study for approximately one month. Please do not share the content of this study with anyone else until September 1, 2012.

**Benefits of Participation**

There will not be direct benefits to you as a participant in this study. Some nurses may benefit from learning strategies to improve communication within health care teams. In addition, we hope to learn how a single web-based educational intervention influences RN staff views of a culture of safety.

**Risks of Participation**

There are risks involved in all research studies. This study may include only minimal risks. Possible risks include discomfort answering some of the survey questions, and discomfort with some of the content in the educational intervention.

**Cost /Compensation**

There is no financial cost to you to participate in this study. The study will take approximately 3 *hours* of your time. You will not be compensated for your time. However, an incentive to participate in this study includes 3 RN Continuing Education Units (CEUs) at the end of the study.

**Contact Information**

If you have any questions or concerns about the study, you may contact Cynthia Parkman at **707-365- 6159 (cell).** For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794 or toll free at 877-895-2794 or via email at IRB@unlv.edu.**

**Voluntary Participation**

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university or your employment at this hospital. You can withdraw from the online survey by X'ing out of the web program. You may also elect to skip any question that you do not want to answer in the demographic form or on the pre and post survey. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Initials _____

***Approved by the UNLV IRB. Protocol #1205-4156M Received: 06-13-12 Approved: 06-29-12 Expiration: 06-28-13***

**Confidentiality**

**TITLE OF STUDY:** Evaluation of an Educational Intervention on Perceptions of a Patient Safety Culture Among staff in Acute Care Nursing Units.

All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. The entire survey package will be completed anonymously to assure confidentiality. The IP function of SurveyMonkey will be disabled so you cannot be identified. You will receive email reminders regardless if you complete the online surveys. Your information will be confidential and findings will only be reported by groups, not by individuals. Only those nurses wishing to obtain CEUs will be asked to share their RN license information.
Only the student researcher and faculty advisor will have access to your RN License number to provide your CEUs at the end of this study, and the NV State Board of Nursing upon request. All records will be stored in a locked facility at UNLV for three years after completion of the study. After the storage time the information gathered will be destroyed.

**Participant Consent:**

I have read the above information and agree to participate in this study. I am at least 18 years of age.
A copy of this form has been given to me.

Signature of Participant_____ Date _____

Participant Name (Please Print) _____

Participant Initials ____

***Approved by the UNLV IRB. Protocol #1205-4156M Received: 06-13-12 Approved: 06-29-12 Expiration: 06-28-13***

APPENDIX G

UNLV
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# Application for Approval of Continuing Education Course

Name and Email Address of Person Submitting Application:

Cynthia Parkman, PhD(c), MSN, RN Email: parkmanc@unlv.nevada.edu

Title of Course: ____Promoting Professional Conduct: Module 1: Professional Conduct, Teamwork, and Patient Safety_____

Date (s) and Time (s) of Presentation:
TBD: Online access via Healthstream, Summer 2012 (anticipated date after IRB approvals completed). 2-hour module.

Number of Contact Hours (60 Minutes = 1CE): __3 CE___ Intended Audience: ___Beside RN staff at St. Mary's RMC___

Application Must Include the Following:

_____a. Brief Description/Overview of Course:

The *Professional Conduct Toolkit*, developed by the Department of Defense in 2010, is designed as a training aid for facilitators, instructors, and educators who are implementing TeamSTEPPS® (Department of Defense, 2010) to improve communication and other teamwork skills. The Toolkit is also designed for health professionals who may be serving in leadership roles or who are seeking resources for addressing behaviors that negatively impact patient safety and that disrupt the clinical work environment. Module 1 (Professional Conduct, Teamwork, and Patient Safety) of the Toolkit will be used as an online educational intervention component for RN staff during the dissertation study, between the first and second survey. The course includes videos as well as PowerPoint slides that explain the topics of professional conduct, teamwork, and patient safety.

_____b. Course Objectives

There are 5 objectives:

1. Describe how professional conduct supports effective teamwork and safe patient care.
2. Define unprofessional conduct.
3. Describe the impact of disruptive and intimidating behavior on the clinical care environment.
4. Define patterns of unprofessional conduct including bullying and horizontal violence.
5. Identify two approaches for responding to unprofessional conduct—enforcement and engagement.

_____c. Course Content (How does the content meet the course objectives?)

| **Module Contents:** | **Time:** |
|---|---|
| Joint Commission Sentinel Event # 40 & Video:<br>Prevalence & Impact of Unprofessional Conduct (Experts on professional conduct and disruptive behavior). | 10 minutes |
| Slides (set 1-4): | 10 minutes |
| 1. Recognizing what works | |
| 2. Defining unprofessional conduct | |
| 3. Impact of unprofessional conduct | |
| 4. Patterns of unprofessional conduct | |
| **Videos**: Horizontal violence and bullying | 25 minutes |
| Two approaches: Enforcement and engagement (5 slides) | 10 minutes |
| Module 1 Summary | 5 minutes |
| Course evaluation/post-test | 5 minutes |
| Total approximate module time: | 65 minutes |

*Note: the videos in this module may take more time, as there are more videos provided in the module for "student's" to review if interested. The student researcher reviewed all videos and it took approximately 90 minutes to review the entire module.

*In addition to the Online Module, the participants will do a study online survey TWO times (approx. 1 to 1.5 hour total for the two survey times). With this, the entire hours for the CE equal 3 hours.*

The contents of this educational module properly match the objectives for this course. One area, for example, is the video set of horizontal violence and bullying that provide multiple clear examples of nursing conflict behavior and the impact of this behavior on work.
The Department of Defense prepared this module for free use for any education programs, and has suggested they should not be edited until the program has been used more as the program was brand new in 2010.

_____d. Method of Participant Evaluation (Pre-Test/Post-Test)

Post-test. (Healthstream provides online post-tests. If UNLV nursing prefers to provide a post-test, please send to C. Parkman ahead of time.

# APPENDIX H

Culture of Safety Online Education Course

Module 1 Professional Conduct Post-Test Questions and Answers

1. A characteristic of professional conduct that supports effective teamwork and safe patient care includes:
    a. Standards of Care.
    b. Providing mutual support and trust.
    c. Reporting unprofessional conduct. (answer: b)

2. Unprofessional conduct includes disruptive and intimidating behaviors that interrupt teamwork and undermine safe care.
    a. True
    b. False (answer: a)

3. An example of indirect or passive unprofessional behaviors includes:
    a. Verbal abuse; Belittling
    b. Backstabbing; Withholding information; Retaliation
    c. Physical threats; Throwing objects (answer: b)

4. Disruptive and intimidating behaviors impact the clinical care environment by:
    a. Disruptive behaviors can foster medical errors and adverse patient events.
    b. Disruptive behaviors can decrease the cost of care. (answer: a)

5. Patterns of unprofessional conduct include bullying, which has been defined as "an offensive, abusive, intimidating, malicious or insulting behavior, or abuse of power conducted by an individual or group against others, which makes the recipient feel upset, threatened, humiliated or vulnerable, which undermines their self-confidence and which may cause them to suffer stress."
    a. True
    b. False (answer: a)

6. Horizontal violence has been defined as:
    a. Physical, verbal, or emotional abuse of patients.
    b. Physical, verbal, or emotional abuse of family members.
    c. Physical, verbal, or emotional abuse of a fellow employee. (answer: c)

7. Enforcement, an approach for responding to unprofessional conduct, can be defined as the use of power to address lapses in professional conduct through discipline and other authority interventions.
    a. True
    b. False (answer: a)

8. Engagement, an approach for responding to unprofessional conduct, can be defined as:
    a. Utilizing a code of conduct and written policies for responding to infractions of that code.
    b. The use of progressive disciplinary processes such as reprimands, warnings, suspension, and termination.
    c. A collaborative approach that seeks to correct the behavior while preserving or restoring trust among team members. (answer: c)

# APPENDIX I

**Evaluation of an Educational Intervention on Perceptions of a Patient Safety Culture Among Staff in Acute Care Nursing Units**

- Cynthia Parkman, RN, PhD(c), MSN
- PhD Student
- UNLV
- **Study Focus**
- Purpose of Study: To explore the influence of educational intervention on nursing staff perceptions of a culture of safety
- Background & Significance
  - Workplace shortage; Conflict; Turnover
- Problem Statement
  - January 2009: Joint Commission Mandate
- **Study Methodology**
- Design: Quasi-experimental two group pre-test and post-test design
- Sample: RN staff working in acute care & ED units at SMRMC
- Instrument: Hospital Survey on Patient Safety (HSOPS)
  - Developed by AHRQ
- Findings: Aggregate data reporting only (compare the two groups)
- **Procedures**
  - IRB approval: (UNLV: June 29, 2012; & SMRMC: in process)
  - Recruitment strategies:
    - CNO Approval
    - Managers/Supervisors
    - Unit Huddles
    - Advertise in "InfoFlash" email bulletin
    - 3 free CEUs at end of study
  - Short Timeline:
    - RN staff email their interest in the study.
      Then: Week 1 survey; Week 2-3 Education Module; Week 4 re-survey.
- **Study Time Periods**

- Pre-survey: Huddles, handouts, & staff email interest & RN License number for CEUs
    - *(Who contact for joining huddles?)*
    - Researcher randomly sorts groups
- Week 1: Survey available online
- Week 2-3: Intervention group completes the education module
- Week 4: Survey available online
    - Researcher will send Email reminders during each step (first survey; module; resurvey)
- **Education Module**
    - Department of Defense Module 1
        - Professional Conduct Toolkit (2010)
    - Module 1: Professional Conduct, Teamwork, & Patient Safety concepts
    - Taken by RNs in the intervention group (randomly selected from study volunteers)
        - Via *Healthstream*, with Education staff support
    - RNs in control group can do the module at end of the study

APPENDIX J

- **Evaluation of an Educational Intervention on Perceptions of a Patient Safety Culture Among Staff in Acute Care Nursing Units**

- Cynthia Parkman, RN, PhD(c), MSN
- PhD Student
- UNLV
- **Study Focus**
- Purpose of Study: To explore the influence of an educational intervention on nursing staff perceptions of a culture of safety
- Background & Significance
  - Work environment; staff shortage; Conflict; Turnover
- Problem Statement
  - *January 2009: Joint Commission Mandate*
- **Study Methodology**
- Design: Quasi-experimental two group pre-test and post-test design
- Sample: RN staff working in acute care & ED units
- Instrument: Hospital Survey on Patient Safety (HSOPS)
  - Developed by AHRQ
- Findings: Aggregate data reporting only (compare the two groups)
- **Procedures**
  - IRB approval: (UNLV: June 29, 2012; & 1 Reno hospital: 8/2012); Valley Health System hospitals: to be determined.
  - Recruitment strategies:
    - CNO Approval
    - Managers/Supervisors
    - Advertise in hospital email bulletin?
    - Fliers via nursing education staff?
    - 3 free CEUs at end of study
  - Short Timeline:
    - RN staff email their interest in the study.
      Then: Week 1 survey; Week 2-3 Education Module; Week 4 re-survey.
- **Study Time Periods**
- Pre-survey: Fliers/advertising, & staff email interest in study
  - Researcher randomly sorts into 2 groups
- Week 1: Survey available online
- Week 2-3: Intervention group completes the education module
- Week 4: Survey available online
  - Researcher will send Email reminders during each step (first survey; module; resurvey)
- **Education Module**
  - Department of Defense Module 1
    - Professional Conduct Toolkit (2010)
    - Professional Conduct, Teamwork, & Patient Safety concepts
  - Taken by RNs in the intervention group (randomly selected from study volunteers)
    - Via web access *(independent site, or, via hospital online education site)*
  - RNs in control group can do the module at end of the study

APPENDIX K

**E-mail to Nurses Interested in Participating in Study**

Thank you for your interest in this nursing research study entitled *Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units*. The purpose of this study is to explore the influence of an online educational intervention on nursing staff perceptions of a culture of safety. In addition, this study will add to our understanding of the efficacy and value of using the Department of Defense "Professional Conduct" (2010) online toolkit as an educational intervention in influencing nurses' perceptions of safety, and promoting safe patient care. Patient safety and nursing staff safety has become a vital concern for all patient care areas, and also has been a critical issue with the Joint Commission, and other programs. It is important to explore how a web-based uncomplicated educational intervention influences RN staff views of a culture of safety. However, at this time, no research has focused on using a single online safety module with RN staff. Your participation in this study will provide valuable insight into this area.

The link at the bottom of this page will take you to the study informed consent form. **Please note that the consent form and survey #1 are will be open soon, for one week total.** You will receive an email when the survey opens. After reading the form, if you agree to participate, just click to the next screen (by clicking on "yes") to answer a brief demographic form and a survey regarding the culture of safety.
You will also be notified **via e-mail** by the student investigator within a week as to whether you have been randomly assigned to the study group completing the online education module or the study control group.

If you are in the study group completing the online education module, you will receive an e-mail notifying you to use your login to access Healthstream and complete the online module. After completion, you will receive an e-mail with a link to complete the post survey. After completing the survey, you will be given the opportunity to complete the online education module and receive 3 free CEU's if you submit your RN license number to the student investigator.

If you are in the control group, there is nothing else you need to do for a few weeks. At that time, you will receive an e-mail with a link to complete the post survey. After completing the survey, you will be given the opportunity to complete the online education module and receive 3 free CEU's if you submit your RN license number to the student investigator.

If you have any questions, please contact: parkmanc@unlv.nevada.edu

Thank you:

Lori Candela, Ed.D., RN
Principal Investigator
UNLV
702-895-2443

Cynthia Parkman, MSN, PhD(c), RN
PhD Doctoral Student Investigator
UNLV
707-365-6159

**Link to begin viewing informed consent as soon as you are emailed:**
https://www.surveymonkey.com/s/Survey1A_HSOPS

APPENDIX L

**STUDY INFORMATION FLYER**

You are being invited to participate in a doctoral nursing research study entitled *Evaluation of an educational intervention on perceptions of a patient safety culture among nursing staff in acute care nursing units*. The purpose of this study is to examine RN staff views of the culture of safety in their work environment. Patient safety and nursing staff safety has become a vital concern for all patient care areas, and also has been a critical issue with the Joint Commission, and other programs. It is important to explore how a web-based educational intervention on the culture of safety influences RN staff views of a culture of safety. However, at this time, no research has focused on using a single online education module with RN staff. Your participation in this study will provide valuable insight into this area. The entire study will take 3 hours and can be done from your computer.

For those who complete the study, 3 free Continuing Education Units (CEUs) will be provided. If you are interested in participating in the study, please email as soon as possible: parkmanc@unlv.nevada.edu

Thank you:


Lori Candela, Ed.D., RN

Principal Investigator

702-895-2443

Cynthia Parkman, MSN, PhD(c), RN

PhD Doctoral Student Investigator

707-365-6159

APPENDIX M

Office of Research Integrity – Human Subjects 4505 Maryland Parkway • Box 451047 • Las Vegas, Nevada 89154-1047 (702) 895-2794 • FAX: (702) 895-0805

# Biomedical IRB – Expedited Review
# Modification Approved

***NOTICE TO ALL RESEARCHERS:***

*Please be aware that a protocol violation (e.g., failure to submit a modification for any change) of an IRB approved protocol may result in mandatory remedial education, additional audits, re-consenting subjects, researcher probation, suspension of any research protocol at issue, suspension of additional existing research protocols, invalidation of all research conducted under the research protocol at issue, and further appropriate consequences as determined by the IRB and the Institutional Officer.*

**DATE:** March 20, 2013
**TO:** **Dr. Lori Candela**, Nursing
**FROM:** Office of Research Integrity – Human Subjects
**RE:** Notification of IRB Action

Protocol Title: **Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Nursing Staff in Acute Care Nursing Units**
Protocol #: 1205-4156M
Expiration Date: June 28, 2013

The modification of the protocol named above has been reviewed and approved.
Modifications reviewed for this action include:
- 3 additional hospital sites (Spring Valley Medical Center, Desert Springs Hospital, Summerlin Medical Center) for subject recruitment.
- Ability to provide flyers to hospital managers to be distributed among supervisors and nursing staff for posting.
- Requests for volunteers to email the doctoral student.
- Doctoral student will provide each volunteer with necessary links.

This IRB action will not reset your expiration date for this protocol. The current expiration date for this protocol is June 28, 2013.

**PLEASE NOTE:**

Upon approval, the research team is responsible for conducting the research as stated in the protocol most recently reviewed and approved by the IRB, which shall include using the most recently submitted Informed Consent/Assent forms and recruitment materials. The official versions of these forms are indicated by footer which contains approval and expiration dates.

Should there be *any* change to the protocol, it will be necessary to submit a **Modification Form** through ORI - Human Subjects. No changes may be made to the existing protocol until modifications have been approved by the IRB. Modified versions of protocol materials must be used upon review and approval.

Unanticipated problems, deviations to protocols, and adverse events must be reported to the ORI – HS within 10 days of occurrence. Office of Research Integrity – Human Subjects 4505 Maryland Parkway • Box 451047 • Las Vegas, Nevada 89154-1047 (702) 895-2794 • FAX: (702) 895-0805

APPENDIX N

UNLV
UNIVERSITY OF NEVADA LAS VEGAS

# INFORMED CONSENT
## School of Nursing

**TITLE OF STUDY:** Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units.

**INVESTIGATOR(S): Dr. Lori Candela (PI), Cynthia Parkman, Doctoral student researcher**
**CONTACT PHONE NUMBER: 707-365-6159 (Doctoral student researcher), 702-895-2442 (PI).**

**Purpose of the Study**
You are invited to participate in a research study. The purpose of this study is to explore the influence of an online educational intervention on nursing staff perceptions of a culture of safety. In addition, this study will add to our understanding of the efficacy and value of using the Department of Defense "Professional Conduct" (2010) online toolkit as an educational intervention in influencing nurses' perceptions of safety, and promoting safe patient care.

**Participants**
You are being asked to participate in this study because you fit this criteria: 1. You are a Registered Nurse currently employed as a staff nurse in an acute care unit, including intensive care and the emergency department; 2. You have worked on your respective unit for at least one month, whether Full-time, Part-time, or Per Diem status; and 3. You have personal email, access to a computer with internet capability, as well as Windows media player and PowerPoint.

**Procedures**
If you volunteer to participate in this study, you will be asked to do the following:
If you agree to participate in the study, you will click to the next page to begin the demographic questions and the survey. You will complete the same online survey at two different times, and the dates for these surveys will be provided to you. Participants will be placed in either the intervention or the control group. If you are in the intervention group, you will have one week to complete the first survey and the student researcher will send an email reminder to you early in the first week.
After the first survey, you will be assigned to do an online education module. You will receive information via email about how and when to access the online module via a provided SurveyMonkey link. You will complete the online module during the two weeks during this study that the module is available, which you can expect to do during the 2 weeks right after the first survey is done. You will receive a reminder email to complete the education module during the first week it is available.
You will complete the online survey a second time at week 4. You will have one week to complete the second survey and the student researcher will send an email reminder to you early in that week.

Participant Initials____

***Approved by the UNLV IRB. Protocol #1205-4156M Received: 03-20-13 Approved: 03-20-13Expiration: 06-28-13***

If you are in the control group, you will have one week to complete the first survey and the student researcher will send an email reminder to you early in the first week. You will complete the online survey a second time at week 4. You will have one week to complete the second survey and the student researcher will send an email reminder to you early in that week. You will have the option to access the online module via the SurveyMonkey link at the end of this study. The estimated time you have to complete the study is over three (3) weeks total spread over 4 weeks, as described above.
Upon completion of the study, if you did both surveys and also the education module, you will receive a CEU certificate via email from the student researcher.
It is important that *no matter which group you are in* we would like you to *not talk with anyone* about the study and the content during this study for approximately one month. Please do not share the content of this study with anyone else until after MAY 30, 2013.

**Benefits of Participation**
There will not be direct benefits to you as a participant in this study. Some nurses may benefit from learning strategies to improve communication within health care teams. In addition, we hope to learn how a single web-based educational intervention influences RN staff views of a culture of safety.

**Risks of Participation**
There are risks involved in all research studies. This study may include only minimal risks. Possible risks include discomfort answering some of the survey questions, and discomfort with some of the content in the educational intervention.

**Cost /Compensation**
There is no financial cost to you to participate in this study. The study will take approximately 3 *hours* of your time. You will not be compensated for your time. However, an incentive to participate in this study includes 3 RN Continuing Education Units (CEUs) at the end of the study.

**Contact Information**
If you have any questions or concerns about the study, you may contact Cynthia Parkman at **707-365-6159 (cell).** For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794 or toll free at 877-895-2794 or via email at IRB@unlv.edu.**

**Voluntary Participation**
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university or your employment at this hospital. You can withdraw from the online survey by X'ing out of the web program. You may also elect to skip any question that you do not want to answer in the demographic form or on the pre and post survey. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Initials _____

***Approved by the UNLV IRB. Protocol #1205-4156M Received: 03-20-13 Approved: 03-20-13Expiration: 06-28-13***

**Confidentiality:**

All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. The entire survey package will be completed anonymously to assure confidentiality. The IP function of SurveyMonkey will be disabled so you cannot be identified. You will receive email reminders regardless if you complete the online surveys. Your information will be confidential and findings will only be reported by groups, not by individuals. Only those nurses wishing to obtain CEUs will be asked to share their RN license information. Only the student researcher and faculty advisor will have access to your RN License number to provide your CEUs at the end of this study, and the NV State Board of Nursing upon request. All records will be stored in a locked facility at UNLV for three years after completion of the study. After the storage time the information gathered will be destroyed. None of the participating hospitals will be specifically identified in publications.

**Participant Consent:**

I have read the above information and agree to participate in this study. I am at least 18 years of age. A copy of this form has been given to me.

Signature of Participant _____ Date _____

Participant Name (Please Print) _____

Participant Initials _____

***Approved by the UNLV IRB. Protocol #1205-4156M Received: 03-20-13 Approved: 03-20-13Expiration: 06-28-13***

APPENDIX O

Dear Study Participant:

Please click on the link below to begin the online first survey in the *Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units* research study.
This first survey time runs from 9/2/12 to 9/8/12.

If you have any questions, please contact: parkmanc@unlv.nevada.edu

Thank you:

Lori Candela, Ed.D., RN
Principal Investigator
UNLV
702-895-2443

Cynthia Parkman, MSN, PhD(c), RN
PhD Doctoral Student Investigator
UNLV
707-365-6159

**Link to begin the survey:** https://www.surveymonkey.com/s/Survey1A_HSOPS

////////////////////////////////////////////////////////////////////////////////////////////////////

APPENDIX P

Dear Study Participant:

This email is to remind you, if not yet done, to complete the first survey for the *Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units* research study. You may do this by clicking on the link below.
Once more, the dates this survey is open are 9/2/12 to 9/8/12.

If you have any questions, please contact: parkmanc@unlv.nevada.edu

Thank you:

Lori Candela, Ed.D., RN
Principal Investigator
UNLV
702-895-2443

Cynthia Parkman, MSN, PhD(c), RN
PhD Doctoral Student Investigator
UNLV
707-365-6159

**Link to begin the survey:** https://www.surveymonkey.com/s/Survey1A_HSOPS

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APPENDIX Q

Dear Study Participant:

This email is to ***remind you*** to complete the survey the second time for the *Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units* research study, if you have not yet completed the survey.
You may do this by clicking on the link below.

If you have any questions, please contact: parkmanc@unlv.nevada.edu

Thank you:

Lori Candela, Ed.D., RN
Principal Investigator
UNLV
702-895-2443

Cynthia Parkman, MSN, PhD(c), RN
PhD Doctoral Student Investigator
UNLV
707-365-6159

**Link to begin the survey: https://www.surveymonkey.com/s/2B_HSOPS**

////////////////////////////////////////////////////////////////////////////////////////////////////

APPENDIX R

Dear Study Participant:

This is an email *reminder* that you have been randomly assigned to the **study group** completing the online education module in the *Evaluation of an Educational Intervention on Perceptions of a Culture of Safety Among Staff in Acute Care Nursing Units* research study.

*If you have not already done so, please login into *Healthstream* to complete the module. The module is open from 9/21/12 to 10/4/12.
If you have already completed the module, thank you!

If you have any questions, please contact: parkmanc@unlv.nevada.edu

Thank you:

Lori Candela, Ed.D., RN
Principal Investigator
UNLV
702-895-2443

Cynthia Parkman, MSN, PhD(c), RN
PhD Doctoral Student Investigator
UNLV
707-365-6159

APPENDIX S

# Hospital Survey on Patient Safety

**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.**

**If you do not wish to answer a question, or if a question does not apply to you, you may leave your answer blank.**

- *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.*

**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.**

**What is your primary work area or unit in this hospital? Select ONE answer.**

- ☐ a. Many different hospital units/No specific unit
- ☐ b. Medicine (non-surgical)
- ☐ c. Surgery
- ☐ d. Obstetrics
- ☐ e. Pediatrics
- ☐ f. Emergency department
- ☐ g. Intensive care unit (any type)
- ☐ h. Psychiatry/mental health
- ☐ i. Rehabilitation
- ☐ j. Pharmacy
- ☐ k. Laboratory
- ☐ l. Radiology
- ☐ m. Anesthesiology
- ☐ n. Other, please specify: _____

**Please indicate your agreement or disagreement with the following statements about your work area/unit.**

| **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 |

**SECTION A: Your Work Area/Unit (continued)**

| Think about your hospital work area/unit… | Strongly Disagree ▼ | Disagree ▼ | Neither ▼ | Agree ▼ | Strongly Agree ▼ |
|---|---|---|---|---|---|
| 6. We are actively doing things to improve patient safety ..... | ☐1 | ☐2 | ☐3 | ☐4 | ☐5 |
| 7. We use more agency/temporary 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.**

| | 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 | ☐1 | ☐2 | ☐3 | ☐4 | ☐5 |

suggestions for improving patient safety .....

| | | | | | |
|---|---|---|---|---|---|
| 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?**

| **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?***

| | **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.**

| ☐ | ☐ | ☐ | ☐ | ☐ |
|---|---|---|---|---|
| **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.**

| **Think about your hospital…** | **Strongly** | **Disagree** | **Neither** | **Agree** | **Strongly** |
|---|---|---|---|---|---|

| | Disagree ▼ | ▼ | ▼ | ▼ | 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 |

**SECTION F: Your Hospital (continued)**

| **Think about your hospital…** | Strongly Disagree ▼ | Disagree ▼ | Neither ▼ | Agree ▼ | Strongly Agree ▼ |
|---|---|---|---|---|---|
| 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 12 months, how many event reports have you filled out and submitted?**

- ☐ 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

**SECTION H: Background Information**

**This information will help in the analysis of the survey results.**

**1. What is your gender?**

- ☐ a. female
- ☐ b. male

**2. What is your age?**

- ☐ a. 19 – 23 years
- ☐ b. 24 – 28 years
- ☐ c. 29 – 33 years
- ☐ d. 34 – 43 years
- ☐ e. 44 – 53 years
- ☐ f. 54 – 63
- ☐ g. 64 - 73
- ☐ h. Over 73 years

**3. What is your ethnicity?**

- ☐ a. white
- ☐ b. black
- ☐ c. Hispanic
- ☐ d. Asian
- ☐ e. other

**4. What is your highest level of education completed?**

- ☐ a. Diploma
- ☐ b. Associate degree
- ☐ c. Bachelor's degree
- ☐ d. Graduate or professional degree

**5. How long have you worked in this <u>hospital</u>?**

- ☐ a. Less than 1 month
- ☐ b. Less than 1 year
- ☐ c. 1 to 5 years
- ☐ d. 6 to 10 years
- ☐ e. 11 to 15 years
- ☐ f. 16 years or more

**6. How long have you been a nurse?**

- ☐ a. Less than 1 year
- ☐ b. 1 to3 years
- ☐ c. 4 to 6 years
- ☐ d. 7 to 10 years
- ☐ e. 11 to 15 years
- ☐ f. 16 years or more

**7. Have you completed any previous culture of safety education or training?**

- ☐ a. No
- ☐ b. Yes

**<u>SECTION I: Your Comments</u>**

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

***THANK YOU FOR COMPLETING THIS SURVEY.***

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