2017

Experiences and Barriers for Patient Safety Officers Conducting Root Cause Analysis

Cynthia Lightner
Walden University

Walden University

College of Education

This is to certify that the doctoral study by

Cynthia Lightner

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Nancy Walters, Committee Chairperson, Education Faculty
Dr. William McCook, Committee Member, Education Faculty
Dr. Andrea Wilson, University Reviewer, Education Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2017

Abstract

Experiences and Barriers for Patient Safety Officers Conducting Root Cause Analysis Investigations

by

Cynthia R. Lightner

MS, Marymount University, 1987

BS, University of Louisiana, 1978

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

June 2017

Abstract

Research shows that, when unintentional harm to patients in outpatient and hospital settings occurs, root cause analysis (RCA) investigations should be conducted to identify and implement corrective actions to prevent future patient harm. Executives at a small healthcare consulting company that employs patient safety officers (PSOs) responsible for conducting RCAs were concerned with the low quality of RCA outcomes, prompting this postinvestigation assessment of PSOs' RCA training and experiences. Guided by adult learning theory, the purpose of this study was to assess PSOs' RCA training and investigation experiences by examining self-reported benefits, attitudes, barriers, and time since training, and the relationship between time since training and the number of barriers encountered during RCA investigations. This quantitative study used a preestablished survey with a purposeful sample of 89 PSOs located at 75 military health care facilities in the United States and abroad. Data analysis included descriptive statistics and Kendall's tau-b correlations. Results indicated that PSOs had positive training experiences, valued RCA investigations, varied on the time since RCA training, and encountered barriers conducting RCAs. Kendall's tau-b correlation analysis showed that the time since training was not significantly associated with the frequency of barriers they encountered. Findings suggest that the transfer of technical RCA knowledge was applied during actual RCA investigations regardless of time since training, and barriers contributed to subpar quality RCA outcomes. RCA professional development was designed to enhance nontechnical, soft competency skills as a best practice to overcome encountered barriers and promote social change in the field.

Experiences and Barriers for Patient Safety Officers Conducting Root Cause Analysis Investigations

by

Cynthia R. Lightner

MS, Marymount University, 1987

BS, University of Louisiana, 1978

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

June 2017

Dedication

I dedicate this study to my mother, Annie Houston Rayson Douglas, my departed stepfather, Eddie Douglas, Jr., and because of their unconditional support, my siblings, Margie, Clarence III, Earnestine, Vera, Walter, and Leathia. A spiritual dedication goes to my constant motivator and heavenly grandmother, Manilla "Aunt Nell" Smith. Most importantly, this research is dedicated to my extraordinarily devoted husband, Anthony Lightner, our children Yarina, Anthony II, and Joshua, and grandchildren, Kiersten and Anthony III, because they are all love.

Acknowledgments

I would like to acknowledge the leaders of the company where I worked during my doctoral studies. The company leaders encouraged and provided me with critical support during this journey. I would also like to recognize my primary committee chairs, Dr. Carol Spaulding and Dr. Nancy Walters, and committee members, Dr. Jeral Kirwan, Dr. William McCook, and Dr. Andrea Wilson, for their assistance during this complex move toward my adult lifetime goal.

Table of Contents

List of Tables

Section 1: The Problem

Health care providers' unintentional harm to patients can occur in outpatient and hospital settings. A common health care solution to decrease the problem is to investigate thoroughly each harm event and to make corrections to prevent a future occurrence. The formal investigation is a root cause analysis (RCA), and health care professionals are patient safety officers (PSOs) who lead the process. Although the RCA is an expensive monetary investment, research on the impact or worthiness of these investigations is minimal, from an international and national perspective. Additional studies could increase the body of knowledge on this subject. Section 1 of the study provides in-depth information on patient harm and RCA investigations from local and global organizational levels.

Definition of the Problem

The PSOs are responsible for managing or leading activities that improve the overall performance of work systems and processes that contribute to safe patient care because health care workers unintentionally could harm patients. Khanna (2008) stated that a PSO is a health care professional who is responsible for implementing an integrated, patient safety plan to decrease errors, to design safety systems, and to improve health care outcomes for the patient. PSOs are responsible for making changes to reduce patient harm through RCA investigations. Upon initial hiring into the PSO role, the new officer participates in a standardized, professional patient-safety officer-training course that offers comprehensive instruction on conducting RCA investigations. However, health care leaders at the local level perceived that the outcomes of the investigations are

subpar. The problem was that no posttraining assessment was available to identify gaps or barriers in the processes.

It is no longer news that patients are injured or harmed because of health care personnel's unintentional actions. Due to proven success in the aviation industry, RCA investigations are now an accepted method of reducing patient harm in hospital and clinic settings (Braithwaite, Westbrook, Mallock, & Travaglia, 2006). Although PSOs, after formalized training, conducted RCA investigations at the local level, health care leaders were concerned that training investments, from a monetary, personnel, and patient-safety improvement standpoint, were not in alignment with expected investigation outcomes. Personnel who review the documentation indicated that the PSO's ability to conduct a quality RCA often seemed inadequate (J. George, personal communication, March 19, 2013). However, no posttraining or postinvestigation follow-up occurred to determine how PSOs assess their training experiences after they start performing their role as RCA investigators. No follow-up assessment occurred to determine what barriers they might be encountering in conducting investigations; this is the problem.

A review of the literature revealed limited researchers who addressed outcomes from RCA training or investigations in health care settings, and only a few of those addressed RCAs conducted within the patient safety discipline. An assessment from the PSOs' perspective to identify possible gaps or barriers with their RCA training and investigation experiences led to recommendations or adjustments to improve patient safety, RCA training, and investigation measures or outcomes. A survey assessment methodology was used to identify training gaps, transfer of learning needs, or barriers

encountered during the RCA investigation process. Egan (2012) stated that transfer of learning and retention of information improve when the lag time between learning and structured spaced practice, testing, or structured model-building decreases. The information obtained from this project study could be a first step toward modifying training or investigation processes to help eliminate subpar RCAs for improved patient safety.

RCA is a systematic exploration of the systems and processes that contributed to a patient harm incident (Paradies & Unger, 2008). Leape (2000) stated a change in process to promote patient safety is crucial in reducing the estimated 99,000 preventable medical harm events to patients each year. High quality RCA investigations are poised to yield a reduction in patient harm rates.

The PSOs outsourced RCA training consisted of an expansive in-depth, 2-day certificate-granting course. Active learning occurred throughout the course, and the PSOs completed the course within the first few weeks to 1 year of employment. Several PSOs who participated in the RCA professional development training were employees of a health care consulting company whose mission is to improve other organizations' safety cultures to reduce patient harm.

The healthcare consulting company accomplishes this goal by providing patient-centered improvement services and products to health care organizations, which consist of international and national clients in more than 17 countries (The Beryl Institute, 2012). Team training, team communication practices, simulation training, organizational needs analysis, organizational database review, analysis, and correlation are some services the

company provides. The company is a small business, with fewer than 125 payroll employees (D. Baily, personal communication, August 6, 2012). The company provides professional staffing and consulting services to health care organizations. More than 150 civilian and military organizations worldwide receive services, including military health care office clinics and hospitals (D. Baily, personal communication, August 6, 2012). Many of the employees provide PSO duties at over 70 military health care organizations in the Air Force. The company is responsible for ensuring that employees attend the professional development course.

Rationale

The PSOs' ability to sustain and apply the knowledge and skills learned after training to improve patient safety culture is questionable. There was a gap between training and adequacy of RCA investigations. The purpose of this study was to assess PSOs' reports concerning RCA training and investigation experiences, benefits, attitudes, barriers, and time since training. Additionally, I examined a possible correlation between the time since RCA training and the number of barriers encountered during RCA investigations. The findings from the assessment could lead to the development of a relevant project that includes recommendations or changes to remove barriers and programs implemented to improve RCA training and investigation outcomes for patient safety.

Evidence of the Problem at the Local Level

Many of the employees of the company provide PSO duties at over 70 military health care organizations in the Air Force. The managing staff of the company ensures

that the PSOs have attended or will attend the RCA professional development training course within the first 12 months after employment. The RCA is a systematic method used to examine the reason or reasons why a patient harm event occurred. The RCA also includes solutions and actions necessary to prevent a future occurrence (Sherwin, 2011). An RCA investigation is one duty the PSO performs to structure an improvement process for a system or process that caused patient harm. The PSO usually attends the next available RCA course after employment; the courses occur approximately three times per year. There is 100% compliance with RCA training for the PSOs of the company. As a condition for employment, the PSOs must have a baccalaureate degree. The degree level is an indication, with reasonable assurance, that the PSO has the knowledge, skills, and abilities to think critically and to conduct assigned duties. A baccalaureate degree is a standard requirement for the PSO in the local community (Patient Safety Manager, n.d.).

When a serious, avoidable, patient harm event occurs or almost occurs, an RCA investigation follows to remove the problems in the process or system that caused the harm event. Paradies and Unger (2008) reported that a credible and thorough RCA investigation improves process and issues of systems within organizations. Paradies and Unger defined an RCA investigation as a method to keep a problem from happening again by finding the missing knowledge and the best corrective actions or practices to eliminate or minimize the problem.

The PSOs conduct or facilitate an RCA investigation when the need arises; however, detailed information about the facts, figures, or statistics on the patient harm events or RCA findings at the local level were not included in the current study.

According to the U.S. Code 1102, the specific information on patient harm and RCA data are quality assurance records; therefore, this information is not disclosed. According to Cornell University School of Law (2012), U.S. Code 1102 is medical quality assurance records rule related to the review of medical or dental incidents and risks for the Department of Defense; the records are confidential, privileged, and cannot be disclosed.

A management review of the PSOs' RCA investigations indicated the quality of the investigation might not be capturing the thoroughness expected of such an investigation (G. Baird, personal communication, April 5, 2010). Determining all root causes of the harm event, determining corrective actions, implementing the corrective actions, and measuring the outcomes of the corrective actions to prevent future harm are areas in which inconsistencies in thoroughness need improvement. Summative feedback from each training revealed that PSO employees rated the course very high in content and that course delivery met or exceeded their expectations. The PSOs also indicated high confidence in having the necessary information and tools to go back to their work site and perform all required tasks and assignments related to conducting an RCA. Performance coaching calls with PSO employees at 3, 6, and 12 months after training were consistent with employees' perceptions that the course information was a part of their day-to-day patient safety activities.

As a program director for the health care consulting company that employs many PSOs, I review PSOs' documentation regarding RCA investigations. The RCA investigations facilitated by the PSO sometimes result in weak, incomplete analysis or insufficient solutions to address the process that would reduce future harm to patients. It

was not clear why the professional development training was not resulting in the expected outcome of meaningful RCA investigations. Additionally, there were no posttraining activities or postinvestigation follow-up assessments to determine how PSOs report their training experiences after they begin performing their role as RCA investigators.

After course instruction, sometimes there was an extended period before the PSOs were required to conduct an investigation of the RCA. The amount of time often extended to more than a year. It seemed that PSOs who performed or applied RCA knowledge close to the time they completed the RCA course produced a better RCA investigation. Extended timing, therefore, could contribute to poor transfer of learning or could contribute to other issues that have not been addressed in recent research. The purpose of the current study was to fill this gap.

The survey used in this study was designed to elicit information on training and RCA investigations to describe the amount of time that elapsed between the PSOs' professional development training and when they conducted an RCA investigation. The PSOs' self-reported assessment on the efficacy of the training, the efficacy of their conducted investigations, the presence of barriers in conducting investigations, and the changes in work practices regarding safety, error reporting, and the advancement of safety in health care were other components of the study. Information obtained from the survey revealed PSOs' perceptions of their investigative experiences, benefits of training, and attitudes after they received training and conducted RCA investigations. Survey data were also used to examine a possible relationship between the amount of time since PSOs

had RCA training and the reported frequency of barriers encountered in conducting the RCA. The PSOs' self-reported assessments provided evidence of possible strengths and shortcomings after training or during the RCA investigation. Results of the study could be used to support improvement plans to strengthen the return on RCA investments and outcomes.

Evidence of Problem from Professional Literature

An abundance of literature existed on professional development, patient safety, and the RCA investigation process. However, limited quantitative studies addressed professional development training for health care RCA investigations. Qualitative studies that addressed professional development training and participants' posttraining and investigation experiences were also sparse. The lack of safe patient care from health care organizations that existed to serve quality, error free, and compassionate care was startling (IOM, 2000). The report indicated that almost 100,000 patients die prematurely per year because of preventable medical errors, and that preventable medical errors included a higher number of deaths per year than the number caused by motor vehicle accidents and breast cancer (IOM, 2000). Strategies to improve patient care within organizations were a part of the report. As a means to prevent future errors, one strategy was to understand why organizational accidents happened and to develop a system that would not only identify patient harm events, but also to include methods to learn from the errors (IOM, 2000; Reason, 2003).

Leape (2000) stated that a change in process to promote patient safety is crucial in reducing the estimated 99,000 preventable medical harm events to patients per year. High

quality RCA investigations are poised to yield a reduction in patient harm rates. Health care organizations reacted to reduce the harm rates through a variety of patient safety activities. Patient error reporting started to increase after the report by the IOM. The data obtained from the increase in error reporting was analyzed to find solutions to correct the problems that were causing patient harm. Proven methodologies to correct system problems and improve processes within an organization to reduce patient harm included the plan, do, check, act (PDCA) model, lean production, and a popular RCA methodology (Leonard, Frankel, Federico, Frush, & Haraden, 2013). These processes were used to identify and solve problems to reduce patient harm. The RCA problem-solving process was used to determine the root causes that led to patient harm. The proven process provides guidance on developing corrective actions and permanent solutions that serve as safeguards to prevent a future error or harm event.

The Joint Commission (TJC), a health care accreditation organization, requires an RCA investigation on all serious patient harm errors or sentinel events reported voluntarily. Yuniarto (2013) described an RCA as an analysis process used to define a problem, identify underlying causal factors and root causes of the problem, and implement corrective actions or prescribed procedures to prevent the problem from happening again. This definition indicates the seriousness in removing factors that caused the patient harm. The harm to the patient from a serious or sentinel event is severe; it often results in death or a permanent loss of a vital function (TJC, 2013). Yuniarto's definition is in line with TJC belief that knowledge of a problematic process or root cause analysis investigation of a system is necessary to understand the fundamental reasons for

the failure or inefficiency (TJC, 2013). The understanding of the root cause, the selection of solutions, and interventions to correct the process or system are usually sufficient to prevent future problems. Many hospitals and ambulatory clinics associate with TJC because their accreditation signals that the health care organization is high performing and provides high quality patient care (TJC, 2013).

TJC has been a nationally recognized leader in health care performance measurement since the mid1980s (TJC, 2013). TJC's record of accomplishment validates the experience of the organization. The staff of the commission reviewed over 900 RCA reports for sentinel events in 2012, and over 2,900 reviews occurred since 2010. From those reviews, the five leading sentinel events reported were retained foreign object during a procedure or surgery, wrong site surgery or procedure, a delay in treatment, suicide, and an operative or postoperative complication (TJC, 2013).

Of the five leading process and system failures cited, the five most frequently occurring root causes noted from the RCA investigations were issues with miscommunication, a human factor such as fatigue, leadership problems, assessment missteps, and the physical environment of the health care facility or information management structure (TJC, 2013). The total harm events voluntarily reported probably represented a small fraction of what remained unreported. TJC posted a disclaimer on the RCA investigation data that stated that because sentinel events notification is a voluntary process, only a fraction of actual events are reported; no epidemiological conclusions were available on the aggregated RCA data (TJC, 2013).

The rate of patient harm issue captured Congressional interest, and the Obama administration launched a Partnership for Patients initiative in 2011 that called for a reduction in patient harm events by 40% by 2013 (Institute for Healthcare Improvement [IHI], 2011). The problem with subpar RCA investigations warrants exploration. Understanding this problem could lead to a reduction of inpatient harm events within health care organizations.

The research problem was to gain insight into a local RCA problem. The literature review indicated the magnitude of the problem with patient harm events, and the intent of RCA investigations to resolve them was compelling. The purpose of this study was to assess PSOs' reports concerning RCA training and investigation experiences, benefits, attitudes, barriers, and time since training. Additionally, I assessed whether there was a correlation between the time since RCA training and the number of barriers encountered during RCA investigations. The findings from the study led to the development of a project that consisted of recommendations or changes to remove barriers and to improve RCA training and investigation outcomes for patient safety. Understanding PSOs' experiences regarding RCA training and investigations could provide insight on their training, the dynamics that occurred when conducting the RCA, and their perceptions of outcomes. The knowledge could help in developing solutions to improve the quality of RCA investigations and reduce patient harm incidents in the local setting. Findings may be shared with local health care professionals to guide and improve their patient safety RCA education and activities. Correcting the specific gaps could improve patient safety and promote social change in the health care environment.

Terms and Definitions

Adverse event: An adverse event is serious harm or injury to a patient that resulted from omissions or things done in error by health care workers; the patient's disease or condition did not cause the adverse event (Luk, Ng, Ko, & Ung, 2008).

Facilitated an RCA: The PSO participated as an RCA team member and led the team through the formalized RCA process (Paradies & Unger, 2008).

Health care quality: Health care quality is the level to which health care workers achieve safe patient outcomes (Shur & Simons, 2008).

Participated in an RCA: The PSO was an actively involved team member in the RCA investigation, but did not facilitate or lead the team through the formalized RCA process (Paradies & Unger, 2008).

Patient safety: Actions and activities that focus on the prevention of patient injuries (Thompson et al., 2008).

Patient safety culture: Patient safety culture is the observable behavior and work processes within an organization (Leonard et al., 2013).

Patient safety culture artifacts: Patient safety culture artifacts are expected staff and leaders' behaviors that promote safe and optimal patient care, nonpunitive reporting of the organizations' risk hazards and unsafe patient events, corrective action on reported risks or events, and feedback on corrective actions to the reporter of the concerns (Leonard et al., 2013).

Patient safety officers (PSOs): PSOs are trained professionals who collaborate with unit staff, departmental leadership, and the hospital or health care facility to ensure a

safe and supportive culture that supports various initiatives that foster patient safety and a clinical environment of service excellence (Denham, 2007).

Quality: Quality is a defect- and deficit-free standard of nondeviating excellent patient care that is measured against other organizations in the health care community (Papa & Rich, 2013).

Root cause analysis (RCA): A root cause analysis is a performance improvement and problem-solving method targeted at identifying, correcting, and eliminating obvious and hidden root causes of an undesirable event. Targeting corrective actions at the root causes minimizes the chance that the event will recur (Paradies & Unger, 2008).

Root causes: Root causes are the most basic reasons why a patient harm incident or adverse event occurs (Braithwaite et al., 2006; Paradies & Unger, 2008).

Sentinel event: A sentinel event is an unexpected or unanticipated injury to a patient that involved death, loss of limb or function, or psychological harm (Hancock & Algozzine, 2011).

The Joint Commission (TJC): The Joint Commission is a United States based nonprofit, independent organization composed of doctors, ethicists, and other health plan experts that sets standards and an accreditation process for health care facilities on quality patient care, safe medication use, infection control measures, and consumer rights (Rouse, 2010).

Significance

At the local organizational level, PSOs received training to conduct a RCA. Based on written feedback, their RCA training was good. Based on verbal feedback, their RCA

investigation conclusions and outcomes might not be meeting the expectations of various stakeholders. PSOs need to conduct a thorough and credible analysis of a harm event to reduce future harm to patients. In a preservice setting, the PSOs benefitted from an extensive RCA training course; however, a perceived gap in performance existed with the quality of their RCA investigations. The research questions addressed their posttraining and RCA investigations to understand and improve training or experience deficits.

Reducing the number of patient harm events remains a challenge despite 10 years of dedicated initiatives to reducing occurrences and preventing harm in health care organizations. James's (2013) new estimates of patient deaths caused by harm events included 210,000 deaths per year, which was twice what the IOM reported in its landmark study. RCA investigations conducted proactively and reactively are intended to address this problem. If investigations are insufficient or ineffective, patients' safety continues to be at risk. The global expectation of RCA investigations to reduce patient harm includes the need to study the level of preparation and training involved in preparing PSOs as competent facilitators of RCA investigations. Findings from the current study may be used to improve service and ensure patients' access to safe care in hospital and ambulatory clinics.

When PSOs optimize RCA investigations, social change is probable within health care organizations. PSOs can save the lives of patients. Patient harm rates may decrease significantly because of credible and thorough RCA investigations, which could meet the Obama administration's goal of reducing patient harm events (Healthcare Government, 2012).

The purpose of this study was to assess PSOs' reports concerning RCA training and investigation experiences, benefits, attitudes, barriers, and time since training. Using survey methodology, I examined whether there was a correlation between the time since RCA training and the number of barriers encountered during RCA investigations. The findings from the assessment led to the development of a project that consisted of recommendations or changes to remove barriers to improve RCA training and investigation outcomes for patient safety. Findings from the study added to the body of knowledge regarding this problem. This study addressed issues and identified successes with RCA investigations to elevate the quality of RCA investigations.

Research Questions

The study included two questions concerning the PSOs self-reported training and posttraining RCA investigation experiences:

1. What do PSOs report as their training and investigation experiences, benefits, attitudes, barriers, and time since training toward improved patient safety in health care settings after preservice RCA training and RCA investigations?
2. What relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting an RCA?

Research Hypothesis

H_0: No significant relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting an RCA.

H_a: A relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting an RCA.

Review of the Literature

To address RCA training and investigation, I conducted a critical review of the literature including defining a theoretical framework and maintaining a practical focus on this issue. Knowles's *adult learning theory*, *transfer of learning*, *training*, *patient safety*, *safe care*, *patient harm events*, *root cause analysis*, and *performance outcomes* were key words used to conduct the review. I searched peer-reviewed journal articles, online websites of health care accreditation organizations, scholarly books, personal communications, professional health care and patient safety conferences, and the Agency for Healthcare Research and Quality (AHRQ) database. Search engines and websites used to locate relevant literature included Google Scholar, ProQuest, EBSCOhost, ERIC, Medline, and SAGE publications. I also used my personal library of professional books, journals, and professional resources. The Walden library proved most beneficial for conducting searches because of its multiple key word and phrase search capabilities.

The theoretical review included an overview of adult and transfer of learning theories. The theories aligned with the community of practices and knowledge related to professional education and work-required training. The critical reviews of the literature included the global body of knowledge related to the problem of patient safety and RCA. The critical review included patient harm events, patient safety etiology and its current state, RCA methodology, and the use of RCAs as a preventive measure to reduce patient harm events.

Theoretical Foundation

The theoretical foundation of this doctoral study was andragogy, a theory of adult learning. Knowles developed six assumptions or theories about adult learning or andragogy that suggested adult learning should focus on the manner in which the learning is introduced (McGrath, 2009). Lindeman, introduced the term "andragogy to American education as early as 1926," but Knowles developed assumptions and studied andragogy extensively (Clardy, 2005, p. 4). Knowles provided professional acknowledgement of Lindeman's adult learning assumptions in his original 1998 document on adult learning theory (Moberg, 2006). According to Knowles, Holton, and Swanson (2011), adult learning is learner centric and not teacher centric. Knowles's learner centric theory highlights assumptions or principles about matured individuals. For example, adult learners self-direct their will and resist learning situations in which they perceive that others are imposing their wills on them. Adult learners refer to experiences and use that information as resources for learning. Adults are ready to learn if it is relevant to their role or social needs, and if it can be applied immediately to help perform a task or solve a real-life problem. Adults undertake learning and invest a considerable amount of resources to it if they believe there is a need to know about what teachers present (Knowles et al., 2011).

Though andragogy is one of the leading theories of adult learning, researchers continue to identify weaknesses in its use. Critics are not in agreement with Knowles's andragogy theory (Heller, 2004; Pratt, 1993; Rachal, 2002). Andragogy does not meet the requirements of scientific theory because of the lack of evidence-based studies and

investigations (Merriam, Caffarella, & Baumgartner, 2007). McGrath (2009) argued that Knowles's assumptions are guidelines for what the adult learner should be like in the classroom. Taylor and Kroth (2009) offered a solution and constructed an instrument that could be used to collect empirical data on Knowles's assumptions. Perrin developed a testable instrument in 2000 but it proved to lack reliability (Knowles et al., 2011).

As the debate about andragogy continues, researchers make changes in its use. For example, Holton, Wilson, and Bates (2009) created the Andragogical Practices Inventory (API) to measure the assumptions with a reliability of alphas between 0.7 and 0.9 (Knowles et al., 2011). Development of the API reliability instrument supported my choice in using Knowles's assumptions as the theoretical base in understanding PSOs' experiences with RCA learning and implementation. The learning process (Knowles et al., 2011) includes attention to preparation of the learners, the learning climate, planning, assessment, designing of learning needs, mutual determination of learning objectives, use of learning activities, and the evaluation of the learning experience.

Another concern about andragogy related to the transfer of learning. Gitonga (2007) stated transfer of learning is challenging but necessary in achieving intended objectives of learning. Knowles's model, which addresses learning elements and the manner in which they occur and transfer, was selected to show a clear contribution in understanding the differences that might exist between the PSOs' learning and RCA experiences post preservice RCA training. If the training from the course addressed Knowles's assumptions, PSOs should have been able to apply the knowledge in a practical work setting. The opposite may have occurred during RCA investigations. For

example, a subpar RCA investigation may have resulted because Knowles's assumptions were unmet by PSOs during professional development training, transfer of learning opportunities, or during an actual RCA activity.

The learner needed to have all assumptions met in order to achieve maximum output from the learning activity. Each principle was used to assess PSOs' experiences. If motivation was lacking, the learner might not have been inspired to obtain the knowledge on how to conduct an RCA. If self-directed behavior was missing during the professional development training or during an actual RCA investigation, the learner likely believed that he or she did not have control over his or her learning or RCA experience. The investigation or performance outcomes may not have met expectations because of lack of control of the manner in which the investigators conduct RCAs.

Knowles's assumptions about the ways adults learn are fundamental to experiential learning. Experiential learning for PSOs occurs when the learning style includes subjective balance and substantial involvement of interaction, content, and incentive during professional development and RCA experiences (Illeris, 2007). Absence or delay in experiential learning during training or RCA facilitation could contribute to subpar investigation outcomes or PSOs' performance. These examples indicate how the study problem and related questions aligned with Knowles's theoretical lens as a method to investigate and understand the RCA training and experiences of PSOs. In the following critical review of the literature, I considered content-specific research concerning the foundational elements of root cause analysis, including patient safety, patient harm

events, and the root cause analysis investigative process and associated training. I also addressed adult learning, transfer of learning, and performance outcomes.

Critical Review of Literature

This critical review of the literature (CRL) focuses on five areas that were germane to training for programs for patient safety officers. Beginning with focus on patient safety, the CRL includes a discussion of patient harm events, root cause analysis, transfer of learning and adult learning theory, performance outcomes, and implications. A summary of the CRL is also included.

Patient Safety

In 2001, the IOM published a report, in which *quality* was defined in six dimensions including "safe, patient centered, effective, efficient, equitable, and timely" (Papa & Rich, 2013, p. 19). Safe patient care led the list. Aside from the harm that errors cause patients, safe patient care might lead quality dimensions because in 2008 there were $29.5 billion medical error expenses in the United States; $17 billion resulted from additional medical care, and $1.1 billion related to lost productivity from disability claims (Health and Human Services, Centers for Disease Control and Prevention, 2009). According to AHRQ (2014), inadequate safe patient care contributed to 99,000 patient deaths per year from preventable infections that patients contacted while receiving care for some other condition during hospitalization or a condition occurring at an ambulatory healthcare clinic.

Researchers are questioning why the health care industry is susceptible to medical error. One reason is that individual health professional roles are often conducted

independently (Varkey, Reller, Smith, Ponto, & Osborn, 2006). According to Varkey et al., (2006), in many settings hierarchy, individual responsibility, and decision-making are the relied upon norms, and this creates the opportunity for patient safety mistakes and some catastrophic mistakes. Although health care organizations are complex systems, reform that eliminates the opportunity for patient harm is needed. The IOM classified the patient harm events into diagnostic, treatment, and a group that included equipment and communication mistakes (IOM Report, 2000). According to an AHRQ (2008) study, surgical errors within the treatment category of harm events cost nearly $1.5 billion per year. The fiscal burden is reason enough to address this problem, and the AHRQ argues that all organizations have an obligation to prioritize eliminating patient errors (AHRQ, 2008).

Another reason for reform relates to a lack of interaction in the service environment. Patient errors point to health care team members' inability to interact with each other relative to patient-specific, person, team, and work environment factors (Nichols, Copeland, Craib, Hopkins, & Bruce, 2008). Mazur and Chen (2009) argued that medical errors stem from the technical complexity of procedures or tasks, human resource issues, and inadequate resources. The problems related to the harm events as cited by the IOM (2000), Nichols et al. (2008), and Mazur and Chen (2009) reflected the complexity of the health care system and the need for patient harm elimination and reduction solutions. The technical and human dynamics within a health care organization are challenging and have negatively aligned with patient safety and quality care optimal outcomes (Institute for Safe Medication Practice, 2014; Papa & Rich, 2013; Phillips &

Metcalfe-Smith, 2014). Actions to mitigate the causal factors are necessary to reduce medical errors.

Responsive actions have occurred to reduce or eliminate errors or events. One of the responsive actions was the establishment of the U.S. Department of Veteran's Affairs (VA) and the National Center for Patient Safety. To correct medical errors, the VA created an RCA model and an RCA training model to reduce patient errors or harm events; the processes were adopted by other national and international organizations (e.g., Australia) (Braithwaite et al., 2006). A review of patient harm events follows.

Patient Harm Events

Patient harm events represent a serious issue in the health care industry. Kohn, Corrigan, and Donaldson (2000) stated that preventable medical errors might have accounted for 44,000 to 98,000 patient deaths, costing hospitals $17 to $29 million each year. In 2002, the National Quality Forum outlined a list of serious, preventable harm events that should never happen (Mallet, Conroy, Saslaw, & Moffatt-Bruce, 2012). Examples include catastrophic loss of life or function, wrong site surgeries, and patient deaths from falls while in a health care setting.

Response to inexcusable events is one area addressed within the TJC. For example, the TJC responded to the IOM report by developing and enforcing national patient safety standards through robust, unannounced health care accreditation inspections (Wachter, 2010). Other accreditors such as the Accreditation Council for Graduate Medical Education, The American Board of Medical Specialties, and the

Accreditation Association for Ambulatory Health Care are becoming more involved in patient safety (Wachter, 2010).

In addition, the IOM report acknowledged that a patient safety movement is required to prevent errors (Classen, Bates, & Denham, 2010; Cohen, 2014). A Canadian study indicated that the health care system incidence of preventable harm events to patients totaled 70,000 (Scobie & Persaud, 2010). The errors occurred from a series of flaws or problems in safety systems that went unnoticed or unattended to (Fillipo & Barnhill, 2010; Jones & Pasciak, 2015; Vanderveen, 2014; Woods & Pestotnik, 2015). An example of a frequently occurring serious, preventable harm event that a patient should never get is a health care associated infection. Health care associated patient infections occur at an alarming rate and are often related to inadequate hand hygiene practices by health providers and are a formidable threat to patient safety (Paranzino, Mork, & Veum, 2012). It is, therefore, necessary that leaders in all health care agencies make a concerted effort toward a patient safety movement to reduce errors occurring within safety systems.

Patient safety is at the core of all efforts to reduce harm to patients in the health care industry. The IOM (2012) noted that although patient safety issues existed and there was much more work to be done, safety improved through various strategies. In a retrospective study, James (2013) used an evidenced-based method, the global trigger tool, to review patients' medical records for adverse event indicators. James found that at least 210,000 patient deaths occur per year due to adverse events. Improvements in patients' risk of injury while hospitalized have challenged health care leaders; 6% of

patients experienced serious harm (Leonard et al., 2013). A patient should not acquire an infection while hospitalized, but it happens and the consequence can be fatal (IOM Report, 2000). Preventable infections are one of the top 10 causes of patient deaths in the United States (Heron, 2016). Other causes of adverse or harm events include diagnostic errors, which caused death in 10% of all adult patients who obtained outpatient care (Scaletta, 2016). Patient harm is not limited to the hospital setting; the ambulatory and outpatient clinics and offices contribute to at least 50% of the medical malpractice claims related to diagnostic and medication errors (Leonard et al., 2013). Improved patient safety efforts at the hospital, ambulatory, and outpatient clinics settings may reduce the number of patient injury, harm, or deaths.

In 2010, the National Quality Forum (NQF) published healthcare safe practice guidance to promote patient safety (Dickey, Corrigan, & Denham, 2010). The fourth safe practice informs medical treatment organizations to identify and reduce the risks to a patient's safety with a systematic method to mitigate and lower preventable patient harm (National Quality Forum, 2010). The RCA investigation process described by Yuniarto (2013) is a systematic method that is commonly used in healthcare systems to reduce preventable patient harm. Wu, Lipshutz, and Pronovost (2008) also indicated that RCA investigations identify flawed system processes, root causes of the flaw, and solutions to prevent or minimize the error from happening again.

With support from organizational leaders, it is necessary that PSOs be postured with the knowledge, skills, and aptitude to accomplish a substantive RCA investigation. A formalized leadership driven safety program predicts the degree of learning from

adverse patient safety events (Ginsburg et al., 2010; McCurley & Pittman, 2014). Otherwise, the reduction in patient harm may continue to be less than desired. Learning and transfer of learning principles are methods used to provide knowledge, skills, and aptitude on a given subject. Through their safety program organizational leaders ensure that PSOs are given the opportunity to acquire the knowledge and skills training that is required in order to accomplish a substantive RCA investigation.

Root Cause Analysis

A root cause analysis (RCA) investigation is the main reactive strategy healthcare professionals use to reduce or eliminate patient harm rates. Healthcare officials also use RCA to increase the quality of care patients "deserve and need" (Leonard et al., 2013, p. 9). A RCA investigation is a search for leading practices or missing knowledge that will keep a problem from recurring (Hyman & Latino, 2014; Paradies & Unger, 2008; Wu et al., 2008). Paradies and Unger further stated that a root cause is "the absence of a best practice or failure to apply knowledge that would prevent the problem" (Paradies & Unger, 2008, p. 2). By definitions, the significance of a thorough and credible RCA investigation is necessary to understand why a patient was unintentionally harmed so that quality measures can be implemented to save patient lives.

The RCA investigation process is a learned strategy of risk mitigation that requires formal course training. The RCA process is integral to patient safety as evidenced by the National Quality Forum pillars. The National Patient Safety Foundation (2015) and Yuniarto (2012) described the RCA investigation as a structured analysis process that includes several steps. The definition of the problem occurs, the underlying

causal factors and root causes of the problem follow, and corrective actions or prescribed procedures occur to prevent the problem from happening again (Paradies & Unger, 2008). One of the roles of PSOs is to collaborate with unit staff and departmental leadership to analyze and identify trends from adverse-event reports by utilizing or facilitating RCA investigations (Leonard et al., 2013). The PSOs in my current study participated in formal RCA training and their role have included facilitation of the investigation and related team processes.

An engineering professional of the Toyota Industries Company, Limited, Sakichi Toyoda founded the RCA investigation framework (Fatima, 2011). The RCA structure was developed to study the design and processes of mechanical production in order to identify latent errors that contributed to unexpected variations and suboptimal system performances of an automobile (Fatima, 2011). The founder is sometimes called the *Japanese Thomas Edison* because of his numerous inventions (Fatima, 2011). The root cause process invention, known as the *five whys,* solved problems or prevented errors within the Toyota auto making industry (Fatima, 2011). The RCA process was eventually adopted by healthcare industries to build quality care and resiliency of work standards within their system and processes.

The analysis of the problem begins by asking why it exists or why it is a problem. Each answer to the structured questions are further explored by asking why until by the fifth or final time, the root cause of the problem is uncovered because there are no more why questions that can explain the cause of the problem (Yuniarto, 2012). Through this process, the true cause of the problem becomes evident. The true cause of the problem is

known as the root cause. Some of the other formal methods that were developed from the RCA framework to find root causes are the Value Stream Map, Change Analysis, Fishbone Diagram, Event Causal Chart, Six Sigma, and the Fault Tree Analysis (Yuniarto, 2012). These methods are not appropriate for use in the present study because the patient and facility-specific data necessary to conduct such analyses are safe from disclosure by federal privacy laws.

In addition to the automotive industry, RCA investigations became a key risk-mitigation tool in maintenance, shipping, mining, occupational health and safety, business, and other industries and communities (Paradies & Unger, 2008). The principles in conducting a RCA also occurred successfully in high reliability organizations such as "petro-chemical, nuclear power, aerospace, and aviation industries" (Bowie, Skinner, & de Wet, 2013, p. 2). These organizations proactively find reliable root cause solutions to internal complex and risky operations; they minimize and prevent harmful and catastrophic events.

The healthcare industry adopted a RCA process similar to the aviation industry to resolve and remove factors that caused healthcare workers to make injurious mistakes to their patients. Another RCA model, known as *Taproot*, developed in 1988, is predominantly in the chemical, petro, and refinery industry (Paradies & Unger, 2008). Paradies and Unger (2008) also stated that based on classes held worldwide, inclusive of the healthcare industry, *Taproot* is a leading RCA analysis system. TJC began mandating structured RCA investigations for sentinel events that caused patients serious harm, loss

of limb, or death. Investigations also occurred to gain insights, retrospectively, from the system mistakes that caused the patient harm (Pham et al., 2010).

According to Wu et al. (2008), the VA's healthcare system requires their facilities to submit RCA reports for serious adverse events to the National Center for Patient Safety and TJC. RCA investigations have become a familiar problem and solution tool used by healthcare organizations in the United States. For example by 2008, over 4,000 RCA investigations were submitted to TJC and over 7,000 patient safety events reported to the VA healthcare system underwent investigations (Wu et al., 2008). The outcomes of the investigations were vast (Wu et al., 2008). A study conducted by the VA showed full implementation of the recommended corrective actions occurred in half of the RCA investigations (Wu et al., 2008). The actions most cited to correct a problem have a low probability of reducing risk, although an average of 20 to 90 hours are necessary to complete a RCA (Wu et al., 2008). The VA's healthcare system robust and time consuming RCA process was extensive but did not include detailed information on outcomes of the corrective actions.

After an extensive literature search and review of peer reviewed articles and books on RCA investigation outcomes, little research was found on RCA benefits post training, or the dynamics associated with conducting a RCA, or the impact that RCA investigations have on promoting patient safety. A lack of national evidence-based research on posttraining experiences occurred from professionals who conduct RCA investigations. Internationally, the literature is also limited; however, two studies related to this problem. The first study occurred in New South Wales, Australia. In 2002,

Australia's healthcare system adopted the VA's model of RCA structured training and investigation techniques (Braithwaite et al., 2006).

A large cohort of RCA trained senior healthcare practitioners completed a survey about their experiences with RCA investigations. The results of the survey revealed motivation for reducing harm to patients was high, benefits in skills and knowledge learned from the RCA course were validated, and tangible benefits with improved patient outcomes did occur (Braithwaite et al., 2006). However, Braithwaite et al. (2006) also found that several difficulties with implementing the RCA were consistent. Unwilling colleague participation in RCA investigations, interpersonal conflict with team members, and most significantly, the difficulty in getting enough time for team members to conduct the RCA were leading issues.

Bowie et al. (2013) replicated the New South Wales study within the National Health System of Scotland. The study emerged because researchers had invested heavily in RCA training as a patient safety, improvement strategy, but had not evaluated the effectiveness of the training or the RCA process outcomes (Bowie et al., 2013). Results from Bowie's study indicated that a lack of time, unwilling colleagues, and interprofessional differences were barriers to the success of RCA investigations trained staff performed (Bowie et al., 2013). The studies highlighted fewer difficulties within the RCA teams and the need for more facilitation, post training, in the RCA investigation process (Bowie et al., 2013).

With a lack of workplace and system support in conducting RCA investigations cited as a predominant issue, Bowie et al. (2013) suggested that organizational leaders

have to provide the RCA trained staff with ongoing professional development and performance feedback opportunities before full benefits with investigations and safer patient care will occur. Bowie et al. (2013) recommended that, in order to increase the body of knowledge on RCA training and investigations for generalization capability, other healthcare organizations should conduct similar outcome or implementation studies. Additional studies may provide further insight on methods that will optimize RCA professional development activities. Additional studies may also inform organizational leaders on how they can positively support RCA investigations. From a business and fiscal perspective, organizations expect beneficial results and outcomes of a RCA investigation to improve patient outcomes. The literature review supports that it is important to ascertain PSOs' attitude and perception about factors contributing to RCA investigation benefits after pre-service training.

As mentioned earlier, the patient safety movement started in 1999 when the IOM report concluded that harm to patients harm occurred frequently while under the care of healthcare staff (Kohn, Corrigan, & Donaldson, 2000). Once patient safety became its own discipline, there has been "unmistakable progress" toward obtaining safer patient care (Wachter, 2010, p. 172). Some data on patient harm and sentinel events remained static or had actually increased (Cohen, 2014; Wachter, 2010). The IOM follow up report, *Best Care at Lower Cost,* indicated that more than 10 years later, the improvements in patient safety are not broad enough and are still less than what is needed or deserved by the people (Leonard et al., 2013). The data may be providing a compass

on the patient safety culture within healthcare organizations in the United States, which indicates progress is evident but not robust.

Wakefield and Jorm (2009) compiled a balanced patient safety measurement framework or short list of items required to measure patient safety. An analysis, like a RCA, on reported patient incidents is one of the measures cited. Wakefield and Jorm (2009) and Yuniarto (2012) conveyed understanding why an event occurred can result in an effective design and implementation of the fixes or solutions crucial for patient safety improvements and problem solving. Understanding the event through a RCA investigation is widely accepted as the norm.

The limitation in reporting harm events or in obtaining access to full RCA reports results in a low volume and depth of information on RCA data and outcomes, which can be shared with other PSOs. The opportunity to learn from a RCA to prevent future patient harm, theoretically, makes it even more important for PSOs to accomplish the most thorough and credible RCA investigation possible. The healthcare community uses the popular RCA methodology nationally, and the PSOs in this study are not exceptions. As popular as the RCA investigation is, the research is very limited on RCA specific studies in healthcare that assessed their effectiveness and efficiency. Healthcare organizations invest heavily in RCA training programs to build capability and capacity despite limited evidence based research (Bowie et al., 2013; Polancich, Roussel, & Patrician, 2014). The need for research that measures the effectiveness of RCA investigations may expedite or promote stronger patient safety improvements in the near future.

Transfer of Learning and Adult Learning Theory

PSOs previously reported high confidence in being able to conduct a RCA at the conclusion of their post RCA training evaluation; therefore, it is reasonable to expect credible and thorough investigations. With that not being the case, it is important to understand if barriers exist that inhibit the transference of PSO training during the RCA investigation, analysis, and evaluation process. Too often, learners have the expectation of applying their new RCA investigation knowledge or skills singularly and perfectly. However, when learners singularly implemented their new knowledge or skills successful transfer was marginal at 10% to 30% effectiveness (Hall, Smith, & Dare, 2014).
Wide ranges of strategies that promote transfer of learning into practice and application of work are in educational and social literature reviews. Cowan, Goldman, and Hook (2010) stated that transfer of learning is evident when a person effectively applies what was learned to accomplish a particular task and also appropriately utilizes that same knowledge to perform a different skill or solve a different problem just as effectively. Transfer of learning strategies that may have supported the PSO's RCA investigation practices may not have been addressed during training.

Understanding how to promote the transfer of learning includes unconsidered theoretical and practical factors (Goldstone & Day, 2012). Transference of learning success happens when the learner has a desire to change, knows what to do and how to do it outside the training environment, works in the right climate for change, and is rewarded for the change (Brandt & Dimmit, 2015; Cowan et al., 2010). When students meet these contextual factors effective training actions result in improved or optimized employee

performance (Cowan et al., 2010, p. 19). Other researchers conducted studies on transfer of learning. They also indicated that strategies to promote learning transfer are necessary before successful application of the learned skills can be practiced outside the learning environment (e.g., Baldwin & Ford, 1988; Cafferella, 2010; Culpin, Eichenberg, Hayward, & Abraham, 2014; Fox, 1984; Taylor, 2000).

Barriers to transfer of learning they may occur before, during, and after formal training (DeFeo & Caparas, 2014; Taylor, 1997). Educational theorist Knowles (McGrath, 2009) defined a popular adult learning theory that addressed the transfer of learning. The transfer of learning is the effective utilization of new knowledge from the attended training or course to a useful action outside the classroom or in another context (Broad & Newstrom, 1992; Caffarella, 2010; Foley & Kaiser, 2013; Kemerer, 1991; Ottoson, 1995, 1997; Taylor, 2000; Vella, 2010;). Gitonga (2007) Bates, Holden, and Hatala (2012), and Goldstone and Day (2012) concluded that work related learning transfer is challenging, yet particularly critical because human lives and perception of being competent to adapt new knowledge effectively is at stake. If barriers to transfer of learning exist it is necessary to remove them to improve training effectiveness and RCA performance outcomes.

Performance Outcomes

The assessment of performance outcomes is a critical indicator on the effectiveness of PSOs training. Assessing performance is the "evaluation of tasks whose measured outcomes focus on the acquisition and development of knowledge, skills, and abilities" (Bishop & Johnson, 2011, p. 175). Varied factors may contribute to the learning

or performance outcomes of employees as supported by the literature. According to Bishop and Johnson (2011), several scholars (Button, Mathieu, & Aiken, 1996; Chen, Gully Whiteman, & Kilcullen, 2000; Phillips & Gully, 1997) concluded that a complex relationship exists among ability, individual differences, and learning capacity and they influence performance outcomes. Evaluation of the PSO's investigation experiences indicated if they acquired necessary RCA investigation knowledge, skills, and abilities.

Bishop and Johnson (2011) indicated performance and learning improves when tasks or jobs recycle because the behaviors become more automatic. Performance also increases when big concepts or ideas are chunked or grouped to form related connections that promote efficient retrieval of knowledge and relevant past actions (Camp, 2012). Much information in the literature is on practicing, memory retrieval, and forgetting. Rose, Myerson, Roediger, and Hale (2010) stated that performance resulted from the capability of the working memory defined as a system that temporarily stores and accesses information to perform learning and other cognitive acts. Strengthening the working memory to avoid forgetting learned information could occur by task specific training focusing on improvement in operational tasks through repetitive goal-directed actions (Hubbard, Parsons, Neilson, & Carey, 2009). In order to gain competence in RCA investigations task repetition may be necessary for the PSOs.

Performance is also based on the extent of support workers get to achieve tasks or to put into place what they have learned in order to perform optimally (Aluko & Shonubi, 2014; Weatherford & Viveiros, 2015). Support may be in the form of stakeholders ensuring that PSOs hone in on their investigation skills through frequent investigation

opportunities. Support may also be in the form of stakeholders ensuring that the work environment is conducive for an optimal investigation experience. The support that occurred during the investigation process was assessed in my current study.

In an economically challenged American society, where budget deficits are the norm, patient harm, reduction strategies, albeit expensive, are at the forefront of obtaining patient safety. RCA investigations are a primary mean to reduce patient harm; but, there is limited research to support RCA training or understand the return on investment. It was important to learn about perceived gains or challenges that resulted from RCA training and implementation actions. Exploration of RCA trained facilitators' attitudes about the overall value of RCA training and utility through their experiences added to the limited first-hand insight on RCA worthiness in preventing patient harm.

Leaders of healthcare organizations can garner information from this particular study as a reference to adjust and redefine their RCA training, facilitation, and supportive measures. Therefore, it is important to prepare the people responsible, such as PSOs, with the necessary professional development on RCA investigations. It is also important to provide PSOs with the organizational support needed to conduct an actual RCA investigation. Knowles's adult learning and the transfer of learning framework served as the construct in studying the perceived subpar RCA investigations at a local level.

Implications

The results of the data collection and analysis may ascertain PSOs assessment on the efficacy of their conducted training and investigations, the presence of barriers in conducting investigations, and the changes in work practices regarding safety, error

reporting, and the advancement of safety in healthcare. The results may also indicate that relationships exist between the amounts of time from when PSOs attended RCA training and the reported frequency of barriers encountered in conducting a RCA. If the opposite is true, the study may indicate that PSOs perceive that no training deficits exist, and there are no barriers to conducting an optimal RCA investigation. The results found may be similar to findings from the Bowie study. The company and organizational leaders might accept the results, and then choose to mitigate the deficits found in the training or RCA investigation. Corrections and improvements to negative findings may include revisions to training, posttraining transfer of learning mandates, and investigation practices.

To build on RCA investigation familiarity and redundancy, the frequency for facilitators to conduct RCA investigations may be a requirement to maintain facilitator status, increase experience, or to achieve professional certification. Inclusion of a required number of investigations that must be conducted annually may also be mandated and fully supported by leaders within healthcare organizations. Dissemination of a leadership focused RCA guidebook as a reference tool may promote engagement of organizational leaders in the RCA investigations. Policy standardized at the local and national level may emphasize the protected time RCA team members are to receive during the investigation process. A process to disseminate leading practices and solutions to optimize root cause investigations may occur within the local and national community because of my current study.

Braithwaite et al. (2006) and Bowie et al. (2013) both found deficits in RCA training and investigations within the education and organizational healthcare systems.

The project may add to the strategies that will prevent a mistake or error from happening to a patient. The study may influence changes that are necessary to improve the RCA investigation process. From the completed study and the data analysis, PSOs' attitudes and experiences about RCAs emerged. The possible knowledge gained should be significant enough to share with healthcare communities.

Summary

Harm to patients continues and some patients die while receiving care from healthcare workers in a hospital, ambulatory, or clinic setting. A vast amount of patient safety research is available regarding this unwanted problem. However, little research is available on the RCA method most frequently used by healthcare organizations to correct problems that have caused patient injury or death. RCA investigations are now mainstream in healthcare organizations, but evidence-based research on this improvement system is limited to mostly single incident RCA analysis (Bowie et al., 2013). Past research or literature review on posttraining experiences of PSOs or other healthcare members responsible for RCA investigations was limited at the local and national level. There is also a gap in the literature that addresses RCA training, learning transfer, and RCA outcome variances as a collective study.

At the local level, the PSOs conducted the analysis of a harm event to reduce harm to patients. In a preservice setting, PSOs benefited from an extensive RCA training course, yet a gap in performance seemed to exist in the quality of the RCA product. Despite professional preservice training, many RCA investigations, per the reviewers, were subpar in providing credible and thorough RCA outcomes. Exploration of this

problem is necessary to minimize patient harm and improve patient safety. Understanding the problem from the PSOs' perspective is ideal to study, because PSOs are at the forefront in managing or leading the RCA investigation as trained and experienced facilitators. PSOs are able to provide deep insight on their RCA training and facilitator experiences, and my current study may be helpful in determining future directions and actions that will positively influence PSOs' performance, RCA outcomes, and patient safety.

The literature review focused on *adult learning theory, transfer of learning, performance outcomes, patient safety, patient harm,* and *RCA investigations*. Although extensive, the reviews found were not specific enough in addressing the PSOs' experiences with RCA investigations at the local level. Minimal literature addressed the triad of learning, learning transfer, and RCA investigation outcomes collectively. I addressed the minimal literature problem by collecting numeric data about PSOs investigation experiences. Quantitative survey research was useful for determining the trends related to RCA training and investigation experiences.

Section 2 of the proposal includes the planned methodology that appropriately addressed the problem of the study. The problem was that there had not been any investigation to determine how PSOs assessed their training experiences after they started performing their role as RCA investigators, or what barriers they may have encountered in conducting investigations. Understanding the barriers and experiences may help in understanding what is contributing to subpar RCA investigations. The research design and approach, the setting and sample, instrumentation and materials, data collection and

analysis, assumptions, limitations, scope, delimitations, and ethical considerations are subtopics detailed in Section 2.

Section 2: The Methodology

The research problem and questions required knowledge from the health care professionals PSOs who are responsible for RCA investigations. The problem was that there had not been any investigation to determine how PSOs assessed their training experiences after they started performing their role as RCA investigators, or what barriers they may have encountered in conducting investigations. Two study questions addressed the problem. The first questions was what do PSOs report as their training and investigation experiences, benefits, attitudes, barriers, and time since training toward improved patient safety in health care settings after preservice RCA training and RCA investigations? Question 2 was what relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting an RCA?

The null hypothesis stated that no significant relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting an RCA. The alternative hypothesis stated that a relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting an RCA. I originally planned to gather details on the PSOs' self-reported RCA training and investigation experiences by developing a survey questionnaire. Then I learned that a preestablished RCA survey was available that addressed my research questions. I abandoned developing a new survey and decided to use the preestablished survey.

Research Design and Approach

I used a quantitative survey design including descriptive and correlational methods to answer the research questions for this nonexperimental study. Survey research is a form of descriptive research. Descriptive research occurs when a researcher examines a situation as is and does not seek to determine a cause-and-effect relationship (Leedy & Ormrod, 2013). Descriptive research addresses the specifics of an observed phenomenon and possible associations among two or more variables (Leedy & Ormrod, 2013). Descriptive research usually addresses *what* and *how* questions (Simon, 2010). This design was most applicable for Research Question 1 because, according to Simon (2010), descriptive studies are used to gather more information about a particular topic of study. Research Question 1 addressed the mean amount of time since PSOs' training occurred, and their reported experiences, benefits, and attitudes after training and after conducting an RCA.

The correlational design was used to answer the second research question concerning the relationship between the amount of time since PSOs had RCA training and the reported frequency of barriers they encountered in conducting an RCA investigation. Correlational research addresses a phenomenon that has occurred to determine whether relationships exist between variables (Simon, 2010). Correlational research is also used to test for relationship differences between one or more characteristics of a variable (Leedy & Ormrod, 2013). In the current study, I examined the relationship between the amount of time since PSOs had RCA training and the reported frequency of barriers they encountered in conducting an RCA investigation.

Nonparametric statistical tests such as Kendall's tau correlations are commonly used when data do not meet the assumptions required for parametric or population statistics (Leedy & Ormrod, 2013; Simon, 2010). A normal bell-shaped population of a variable is assumed "if the sample is large enough at 100 or more observations" and parametric statistics can be used (Simon, 2010, p. 231). The sample population for the study was smaller than 100; therefore, an assumption of a normal bell curve for the population could not be determined and parametric statistics could not be used. It was reasonable to expect that the item scores resulting from the questionnaire responses in this study were not equal, and the sample size was relatively small. Kendall's tau correlation was appropriate to assess the relationship between variables in Research Question 2 (the amount of time since training measured using a categorical scale, and frequency of barriers encountered using a categorically ordered Likert-type measure).

The survey design has a number of positive qualities. Creswell (2012) stated that a survey design is favored in educational research because it can be used to investigate peoples' opinions, attitudes, characteristics, and behaviors. Survey research is beneficial because information can be captured quickly, efficiently, anonymously, and quantitatively at a certain point in time. In the current study, Research Question 1 was answered using survey methodology.

The descriptive and correlational design included the sample of 89 PSOs. The PSOs worked for the same health care company, had the same formal RCA training, and conducted RCAs as a means of improving patient safety. PSOs had firsthand insight on

RCA training and investigation practices. When an entire group makes up a sample, that sample is a census population (Lodico, Spaulding, & Voegtle, 2010).

A census population was the choice because the PSOs in the study were a homogenous group. All PSOs in the census population were at the local level. A census population could be representative of the larger group (Leonard et al., 2012). The census group in this study shared similar RCA training and job-related characteristics as the participants in Bowie et al.'s (2013) study in Scotland. The descriptive and correlational design with census population sampling was appropriate because the findings could be generalized to a larger population.

Qualitative researchers seek to learn about participants' perceptions through the collection of their interpretations and descriptions, but a qualitative approach was not appropriate for this study because qualitative researchers are usually present or interact with the participants during the study (Glesne, 2011). As the participants' supervisor I was concerned that if I had conducted a qualitative approach, my direct interaction to obtain their perceptions may have limited their desire to participate in the study. I decided that the probability of obtaining the most participation may be optimized if the participants responded in an anonymous platform. I would not have been able to collect their responses in an anonymous manner using a qualitative approach.

Also as a researcher and supervisor of the PSOs, my identity may have posed a high risk to influence PSOs' responses. The PSOs could favor responding to the survey items in a manner in which they would not fear retribution for their responses. This high-risk approach could render the study invalid. Therefore, a quantitative survey design

ensuring anonymity for participants was the safest way to ensure integrity of the responses and to obtain an understanding of the relationships between the timing of PSOs' RCA training and barriers they experienced conducting investigations. The quantitative, descriptive and correlational design aligned with my research purpose and questions, and it strengthened the study because the PSOs overall quantitative survey response rate was adequate.

Experimental research was also inappropriate for the study. An experimental design is controlled. Random selection of some the PSOs to a control group who had not had RCA training was not possible. All of the PSOs had been exposed to the same RCA training platforms or investigation opportunities. Waruingi (2010) defined nonexperimental research as a study designed without assigning participants to different groups, as well as without random assignment and a control group. The research questions, the purpose, and preconceived variables in this study aligned best with statistical inquiry of a quantitative approach to examine a the relationship between the variables.

The purpose of this study using survey methodology was to assess PSOs' reports concerning RCA training and investigation experiences, benefits, attitudes, barriers, and time since training. I also examined the possible correlation between the time since RCA training and the number of barriers encountered during RCA investigations. Knowledge gleaned from this type of study could positively influence health care executives' and educators' decisions on training in root cause analysis and eventual investigation practices. Findings may promote patient safety.

Setting and Sample

The study occurred in an online web-based setting. The participants included 89 PSOs who were employees at a civilian health care organization. For the purpose of the study, the organization was the CRL Company. At the time of this study, the company employed over 115 staff members, of whom 90 were PSOs providing services that "build over 500 healthcare organizations into healthier patient safe and patient centric organizations" (F. Harris, personal communication, August 9, 2012). The corporate office of the CRL Company is located in the Southeastern United States; however, the 89 PSOs perform work in Air Force hospitals and clinic settings that are located nationally and internationally.

The population for this study was unique in that it included participants with similar roles and responsibilities in military treatment facilities. According to Lodico et al. (2010) and Waruingu (2010), a population is the wider group of individuals that shares common characteristics about which the investigator of a study wants to make statements. There are 75 such military treatment facilities, and each of the facilities has at least one PSO on duty. A facility director could have replaced and trained more than one PSO due to attrition factors such as resignations or terminations that occurred since formal RCA training began in 2003. Despite the dynamics in retention, the PSO population size was maintains at 89 PSOs.

The plan was to include all 89 PSO staff or census population in the study because of the small size. According to Simon (2010), an unacceptable sampling error over 5% is less possible with small populations of 100 or fewer if sampling does not

occur and surveys are sent to each member of the population. Creswell (2012) added that sampling of the target population could occur to generalize about the target population. However, it seemed practical to include the entire PSO population in this study because all trainees worked for the same civilian CRL company, attended the same RCA training course, were employed as PSOs, and were responsible for facilitating RCAs within their work setting. Therefore, the entire population of PSOs participated in the study.

Waruingi (2010) stated that the PSOs are a group of individuals who share commonalities. Waruingu also acknowledged that populations who live in similar contexts tend to exhibit similar behaviors. The entire population of PSOs who worked for CRL Company received an invitation to participate in the study. The population for this study provided an opportunity to capture shared experiences from the 89 PSOs. Their collected information provided a solid data set from which conclusions regarding the purpose of the study could be drawn.

Although purposeful sampling occurred with the population, using a census population strengthened the reliability of the study. I conducted a power analysis to determine the sample size needed to detect relationships between groups, given a specific power, effect size, and level of significance (see Creswell, 2012). A sample size table is used to determine the appropriate size needed to avoid a sampling error (Creswell, 2012). According to Cohen (1992), using power analysis helps ensure that a study has a high probability of correctly indicating significant results and avoided hypothesis errors. A component of a power analysis called the effect size is “the degree to which the null

hypothesis is false, and is indexed by the discrepancy between the null hypothesis and the hypothesis" (Cohen, 1992, p. 155).

Three other components of a power analysis are the level of significance or risk of rejecting the null hypothesis in error, the sample size, or number of participants necessary to attain the correct power for a selected significance and effect size, and the statistical power or degree of risk in not rejecting a false null hypothesis (Cohen, 1992; Creswell, 2012). The effect size, level of significance, and statistical power are needed to determine the minimum number of participants (Cohen, 1992). A power analysis to determine the minimum sample size for the noncorrelational general survey items addressing RQ1 in my study using Cohen's (1992) power analysis table indicated that for a .05 level of significance with a .80 power criterion and a medium effect size at .50 required 64 participants. However, it was possible that the sample of responders could be smaller for the survey items relating to RQ2 because only responders who had participated in a RCA could answer Survey Questions 11-13. A detailed discussion of these items occurs in the section on instrumentation.

The sample size for the correlational question in my study, using Cohen's (1992) power analysis table indicated that for a .05 statistical level of significance with a .80 power criterion and a medium effect size at .30 required 85 participants for a correlation test involving two variables. I selected a medium effect size instead of a small one due to my limited census population. The sample size was small but was large enough to detect differences or similarities between the two variables in RQ2 with a medium effect size. If fewer than 85 responders answered Questions 11-13, the sample size could be too small

to align with a medium effect size. If that occurred, the effect size could be adjusted using Cohen's power analysis table (Cohen, 1992). For example, with a minimum of 28 respondents, power of .80, at a .05 statistical level of significance, a large effect size at .50 is possible, according to Cohen.

No other type of PSO participants was eligible to take the survey because they did not meet the same eligibility requirements. According to Lodico et al. (2010), purposeful and homogenous participants are considered "key informants" (p. 140) on the subject of study, and they all have "similar attributes" (p. 141) for RCA training, the job environment, and job requirements. Each participant had the same equal opportunity to answer the study survey (Lodico et al., 2010). The current study included the entire group of PSOs at CRL Company because they met the eligibility requirements.

A characteristic of the PSO population was that they were responsible for the patients' activities that promoted patient safety. Coupled with their RCA preservice training, the PSOs, recognized by the leadership and frontline, represented the subject matter experts on the investigation process. Conducting RCA investigations was one of their primary roles and responsibilities. PSO demographics included and documented in the current study were education level, gender, US citizenship, and age group. Also documented, were PSOs' varied healthcare disciplines.

Instrumentation and Materials

A structured, preestablished questionnaire tool complements the goals of this survey study. The survey instrument, developed in Australia in 2005 for RCA research by a primary investigator for the New South Wales Health System was useful for the study.

Scotland's healthcare system adopted the survey, with minor modifications, to research a similar study about RCAs in 2012 (Bowie et al., 2012). The surveys were successful in that they occurred in international journals after rigorous peer review processes. Appendix A includes the project information added to the study after data collection. For the purposes of this current study, the instrument was the Bowie survey (Appendix B). The instrument used by Bowie occurred in the study for data collection purposes. The author of the survey granted permission to use the survey for my study (Appendix C). The Bowie survey was the data collection instrument for the study because the survey consists of questions that provide insight on the overarching purpose of this research study and research question.

The Bowie survey instrument originally expounded the limited body of research about the benefits of RCA investigations on patient safety, improvement programs (Braithwaite et al., 2006; Bowie et al., 2012). The authors of the Bowie survey modified the instrument slightly from the Braithwaite et al. study because of the focus to learn about RCA investigation outcomes post formal training (Bowie et al., 2012). The Bowie survey is a questionnaire consisting of coded responses that are nominal or ordered in levels of agreement on a Likert-type scale. Creswell (2012) defined Likert scoring as scales of measurements to questions that measure variables in categorical units. Depending on the particular question, the Bowie survey agreement or disagreement scales responses range from *definitely* to *not at all* or *never*, from *fully* to *not at all* or *never, from strongly agree* to *strongly disagree,* and from *always* to *never* options. For

survey questions about the number of times something happened, such as *the number of days RCA training involved*, a numerical event response scale occurred.

Four of the items on the Bowie survey, however, differed from original Likert style responses on the Braithwaite instrument and included open-ended questions. To stay in alignment with the quantitative study design of my current study and purpose, the open-ended questions were converted back to the original close-ended responses on a Likert style scale. The Bowie survey used in this study consists of 30 self-reporting items designed to allow the participant to define and rate their RCA experiences (Bowie et al., 2012). The survey is five pages in length.

The PSOs participating in the study selected their responses or answers to each question from the choices listed for each particular question on the survey. The concepts measured by the Bowie survey questionnaire include the participants' demographics, training in root cause analysis, attitudes concerning RCA training, and their experiences with RCA investigations. The benefits, barriers encountered when conducting RCAs, and the *time since training* survey items were located under one of the four distinct categories. Six RCA training questions, six demographic questions, eight attitudes to RCA training, and 10 questions about the PSOs RCA investigation experiences make up the survey. In addition, within the four categories, concepts addressed the extent to which PSOs participated in RCA investigations, the extent to which RCA corrective action recommendations occurred, the perceived level of adequacy of RCA training, and the perceived level of adequacy of the value of RCA investigations are included. All constructs that the survey measures specifically address Research Question 1.

The Likert-type scale responses identified whether the PSOs agreed or disagreed with the items on the questionnaire. The survey responses to the questions, as scored and calculated, were single items. The response for each question or statement had a corresponding score or numeric value assigned. Frequencies included a tabulation for each question.

The reliability of an instrument is the degree to which it produces the same or similar results or measurement each time that it is used (Creswell, 2012; Waruingi, 2012). The Bowie survey used in this study did not report a test for survey reliability in the journal article that published the study (P. Bowie, personal communication, July 9, 2013). The Bowie survey questionnaire was a modified version of the original Likert styled survey questionnaire developed by Braithwaite (Bowie, 2013). Braithwaite and Bowie's survey responses compared in the Bowie study. The Bowie survey included a large sample size, and the RCA research and articles initially appeared in a rigorous peer reviewed journal, the *BMC Health Services Research.* Leading government health care organizations, such as the *National Institute of Health,* also published the RCA studies. Both studies had similar responses, and the responses indicated statistical confidence. However, the stability of the test at two different points in time and the reliability of the Bowie survey were not measured. This lack of a formal assessment of reliability was a limitation of the study.

Lodico et al. (2010) stated that validity is present when the survey instrument has the ability to measure what it is to measure. The Bowie survey reaffirmed content validity after changing three items from Likert-type to open-ended questions. Six colleagues of

Bowie who previously had received the same formal RCA training piloted the modified Bowie survey study (Bowie et al., 2012). The pilot testing confirmed face, sampling, and item content validity.

Minor changes to the wording and style of the Bowie survey questionnaire occurred. The word changes matched specific Australian words to fit the local Scottish wordings (Bowie et al., 2013). The colleagues also tested the changes for validity before dissemination and use by the participants in the study (Bowie et al., 2013). Overall, the pilot testing was a way to make the survey valid in measuring perceptions, attitudes, and opinions about RCA training and investigation experiences.

Likewise, a few of the Scottish words in the Bowie survey translated to the US local English language for the study. For example, a particular word, *out-with,* used in the Bowie survey was familiar and common in Scotland, but was unknown in the US. Replacement of the word with, *outside,* commonly used in the USA. A few other similar minor word adjustments and conversion of the four open-ended questions back to linear Likert scale response options changed on the survey for the study. However, no major modification occurred to the survey design and construct. Pilot testing of the Bowie survey for my current study occurred because of the minor word changes. Three colleagues reviewed and commented on the modified Bowie survey for content validity. Adjustments occurred for cited discrepancies before use of the Bowie survey questionnaire applied in the study.

The population for the study was not random, but purposeful and comprised the total sample of PSOs who had the same RCA training and employment. According to

Lodico et al. (2010), the threat to internal validity decreased when the entire population or census participated in the study. However, no measures of survey reliability or internal consistency using Cronbach's alpha occurred in the prior study that was conducted on Scotland's healthcare system. The principal investigator confirmed this issue in an e-mail message (P. Bowie, personal communication, August 13, 2013). The confirmation message is in Appendix D.

By delivering the survey online, the capabilities participants needed to take the survey included their skills in using and having access to a computer. Communication with the PSOs occurred via email notification and through a national online survey system branded as *Question Pro*. Therefore, each PSO was capable of accessing the internet. Each PSO also had a literacy level that complemented reading and comprehending the survey instrument.

Important to note here was that my original plan, approved by the IRB, was to use the Survey Monkey online survey system as my data collection method for the Bowie survey. However, during the building and functional testing of the online survey applications in Survey Monkey, the level of the participant's response anonymity to the investigator regarding email reminders and survey responses proved inadequate. Using Survey Monkey to communicate with the participants or as the data collection instrument was no longer feasible. To counter or limit a survey response bias, the participant's anonymity was still capable and, thus, maintained through the approved use of *Question Pro*. Within Week 1 of the data collection period, the study came to a temporary stop until approval from the IRB against using Survey Monkey and for using *Question Pro* as

the commercial online survey service occurred. Approval from the IRB occurred within seven days, followed by *Question Pro* e-mail communication to the participants and the start of the actual data collection period.

To complete the survey, the study participants responded to survey items in each of the four categories on the survey. All responses to the survey items counted. The first category on the survey investigated RCA training. One of the six questions asked*: How long ago did you attend RCA training?* The scaled response options for this question ranged from the shortest time interval of *6 months or less* to the longest time interval, *greater than 36 months*, since training.

The next set of questions was under the category of *experience of RCA investigations*. One of the 10 questions asked, In general, did the RCA training provide you with the skills to participate in or facilitate a RCA? The Likert-type response options ranged from *definitely* to *never.* The third category on the survey investigated attitudes toward RCA. One of the questions in this section asked, if the patients and relatives should be a part of the RCA team. The Likert-type response options ranged from *strongly agree* to *a choice of strongly disagree.* The last category of single-item questions was *about demographics,* and a representative question under this section was: How many years of experience do you have in the PSO role?

The response options ranged from *less than two* to *over 13 years*. The participants select the response that corresponded best to their own perception, opinion, demographic, experience, or belief for each question with the exception of some of the 10 questions under the item on experience of RCA investigations. The participants answered questions

in this section, but the PSOs who participated or facilitated in a RCA investigation answered Questions 11 through 13 in this category.

An expectation was that an appropriate response rate for Questions 11 through 13 would occur correctly to determine if a relationship existed as described in RQ2. However, if the sample size of responders was smaller than 28, the opportunity to draw conclusions or generalize the response findings to the rest of the population was limited. It was also insufficient if the sample size of responders was smaller than 64 for the other noncorrelational general responses addressing RQ1. An insufficient overall response rate could influence the validity of the study results. The response rates for the entire study population and the number of respondents to questions (11-13) were reported in the data analysis, the resulting sample sizes was reported as a limitation of the study, and conclusions were qualified. Again, a full version of the instrument is in Appendix B.

Tables, charts, and figures are visual aids used to summarize the raw data collected and analyzed, as a means to explain the details of the variables for the research questions and significant findings from the study. Selected responses, displayed as tables and charts, are in the four distinct categories that show the participants' demographics, training in root cause analysis, attitudes concerning RCA training, and their experiences with RCA investigations. Appendices house the survey and other documents pertinent to the study. For example, the Bowie survey used in the study is located in Appendix B.

Two research questions addressed the research problem and purpose of the study. Research Question 1 is: What do PSOs report as their training and investigation experiences, benefits, attitudes, barriers, and time since training toward improved patient

safety in healthcare settings, after preservice RCA, training and RCA conducted investigations? This question included an examination of descriptive data concerning responses to all the survey questions or items. The training portion of the questions were measured by responses to Item numbers 1-6; RCA investigation experiences were measured by responses to Item numbers 7-16; and attitudes were measured by responses to Item numbers 17-24, with Item numbers 21-24 within the attitude category measuring benefits. The barrier question measured responses to Item number 11. The time since training question measured responses to Item Number 1. The levels of measurement for the data responses are nominal and ordinal. The analysis of these items supported the findings for RQ1. The survey also generated demographic information measured by responses to Item numbers 25-30.

Research Question 2 is: What relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting a RCA? The independent variable (IV) is the amount of time since PSOs had RCA training, which measured responses to the first survey question. The level of measurement for the data response for this question is ordinal. The five ranked response options for IV are *less than six months, 7-11 months, 12-24 months, 24-36 months,* and *greater than 36 months*. The responses were assigned a value for coding purposes in ascending order from 1-5. For example, *less than six months* since RCA training were coded as 1 and *greater than 37 months* were coded as 5.

The dependent variable (DV) was the reported frequency of barriers that the PSOs encountered in conducting a RCA. The 11th survey item measured responses to this

variable. Five frequency response options were available to choose from for each of the eight barrier related sub-item questions listed in the 11th survey item. For each possible barrier, the item asked the respondent to indicate whether the barrier occurred *always, sometimes, unsure, occasionally,* or *never.* The subitem responses were coded so that responses of *never* were assigned a coded value of 0, meaning that that the respondent never encountered that particular barrier.

Conversely, barrier related responses of *always, sometimes, unsure* and *occasionally* were coded as 1, meaning that the respondent did report encountering that barrier at least some of the time or was unsure whether the barrier was encountered. The total 0 or 1 responses for the eight sub items represented a range of possible scores per participant, ranging from 0 to 8. The frequency of reported DV barriers in conducting a RCA included a total for each participant. Collectively, the responses to the Bowie survey comprised the data used to measure each variable in this study. Collecting the responses occurred in a stepwise fashion that included defined regulatory, preparatory and implementation strategies. On completion of the data collection phase, descriptive and statistical analysis of the data occurred. The analysis informed if the null hypothesis for RQ2 could be accepted or rejected.

Data Collection and Analysis

The operations officer at the CRL Company where the PSOs worked granted permission to conduct the study, and gave permission to contact the PSOs to seek their participation in the study. A memorandum of record from the operations officer, granting permission for me to contact the PSOs, using their email addresses is in Appendix E.

Following approval from Walden University Institutional Review Board (#07-22-15-0250811; expiration date 07-21-2016), the CRL Company provided a list of the PSOs' e-mail addresses as the means to contact each PSO anonymously. After receiving approval to conduct the study from Walden's IRB and direction to proceed with data collection, contact with the PSOs for data collection purposes began with electronic communication via the internet. Communication with the PSOs occurred via e-mail communication and through the previously mentioned national online survey system known as *Question Pro.* An electronic version of the Bowie survey placed on the online website was available so that the PSOs could access and complete the survey for the study.

Designing and collecting survey data is a function of the online data collection site. The site manages, for a fee, all data collection aspects of the study. The PSOs' e-mail addresses appeared on *Question Pro*. Each PSO had to be capable of accessing the Internet. Creswell (2009; 2012) stated web-based surveys are very popular for data collection via use of a computer in the US.

Question Pro was the conduit on all communication, including (a) e-mail invitations to the PSOs requesting participation in the study (Appendix F), (b) informed consent with instructions on taking the survey; (c) the online Bowie survey (Appendix B); and (d) reminder e-mail messages to complete the survey (Appendix G). The collection of survey responses as raw data from the participants was unavailable to participants or others. The responses, stored on my password-protected personal computer, are to remain for 5 years before destroyed, as per the policy of Walden.

The minimum number of survey responders needed to have valid outcomes for RQ2 was 28 participants who had conducted a RCA. The minimum number of survey responders needed to have valid outcomes for all other general noncorrelational responses for RQ1 was 64 participants. To obtain maximum survey response, data collection lasted for six consecutive weeks. This amount of time was necessary to accommodate the various time zones in which the participants lived and to provide the PSOs a sense of calmness in having enough time to complete the survey.

The URL link was open for access around the clock during the data collection period. Participants reviewed and agreed to informed consent information before accessing the actual survey link; assessing the link was an indication of informed consent. A second approach used to maximize survey responses was to check the response rate at seven-day intervals. The nonresponders received an email reminder, requesting participation in the survey, and the *Question Pro* link to access the survey was included in the message.

The consent form included guidance that the participants' completion of the online survey was indicative of their informed consent (Appendix F). No survey questions or statements were included on the first page; the PSO had to click another link to access the first question on the survey. To complete the online survey, the PSOs selected their responses from the Likert scale choices by simply clicking on the radio button that best matched their perspectives. The survey took about 9 minutes to complete. All responses occurred in the count. If the response rate did not produce enough data to

validate the outcomes, despite planned efforts to obtain adequate responses, the sample size would be a limitation of the study.

Nature of the Survey Scale and Type of Data Analysis

The survey is a quantitative data collection tool. A demographic section is included in the survey because, according to Waruingi (2012), measurable human population characteristics, such as the vital statistics of a group should be included in a study. Gender, professional group, years of experience as a PSO and healthcare professional, and training delivery setting, are demographic items addressed on the survey. The demographic items on the survey, in general, are nominal; however, the *time since training* item, under the demographic section is ordinal. Demographics aside, the majority of the Bowie survey scale is comprised of quantitative descriptors presented as level of agreement responses displayed on a Likert style rank ordered scale. The survey scale consists of both rank ordered and demographic nominal responses. The variables for RQ1, hypothesis and null hypothesis for RQ2, and the statistics used to analyze each question are the following:

RQ1: What do PSOs report as their training and investigation experiences, benefits, attitudes, barriers, and time since training toward improved patient safety in healthcare settings, after preservice RCA training, and RCA conducted investigations? Nominal and ordinal data measured the variables. Descriptive statistics formed the basis for data analysis. The frequencies, mode, and percentages are most appropriate to analyze the nominal descriptive data for RQ1 because descriptive statistics revealed a complete assessment of all responses from the one population. The ordinal descriptive data

responses included the frequency, mean, mode, and standard deviation. This type of descriptive data analysis occurred in the Bowie study published in 2013.

RQ2: What relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting a RCA?

H_0*:* No significant relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting a RCA.

H_A*:* A relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting a RCA.

The independent variable (IV), *amount of time since training,* measured by ordinal data and the dependent variable, was the *reported frequency of barriers* encountered in conducting a RCA, resulted from summed categorical ordered data. The dependent variable data (total frequency of barriers) showed as the sum of all the reported number of positive barrier responses.

The IV was shown in monthly increments. Kendall's tau-b correlation tests are most appropriate to use with ordinal data taken from a small population or sample size, because the interpretation of the correlation distributed statistically in terms of agreeable or nonagreeable probabilities (Gilpin, 1993). The Kendall's tau-b correlation results provided the needed evidence to accept or reject the null hypothesis for RQ2.

After closure of the data collection period, *Question Pro* services electronically gathered all survey responses, and provided the de-identified raw data within 1 business day. The survey data results, downloaded and displayed into an Excel spreadsheet, provided a preliminary view of the results. A statistician colleague, who is a published

researcher experienced in the use of the statistical software, analyzed the raw survey data, using SPSS version 21.0. The confidentiality agreement with the statistician (Appendix I) occurred after reviewing participant confidentiality and data integrity expectations. As the investigator, I maintained authority on the data analysis findings or conclusions.

Assumptions, Limitations, Scope, and Delimitations

Assumptions

The PSOs needed to have access to and the ability to use a computer and the internet. They needed these capabilities due to the required educational and experience qualifications required of the PSOs who participated in the study. However, an assumption was that the PSOs selected to participate in the study would be eager to do so. Asking them of their intent beforehand was a good indicator that they actually would respond to the survey. Secondly, based on the previous Australian and Scotland studies cited, I had confidence that most participants would complete the survey. An expectation was that the required study response rate of 64 participants would occur for statistical analysis for RQ1 and 28 participants for RQ2.

Conducting the study in the US and using the same survey tool used in Australia and Scotland was with an assumption that in those countries RCA training and investigation processes are similar to the ones in the US. Without having those lived experiences, it was impossible for me to actually to have that knowledge. However, I conducted a thorough literature review on the Australia and Scotland journal reports and communicated by email with the principal investigator of the Scotland study; all information suggested that the training and investigation process were similar. It was also

an assumption that the Bowie survey was the correct tool to use to collect the RCA training and investigation experiences.

The principal investigator for the Scotland study opined that the US geographical location and PSO population for this study was consistent with the other two countries' RCA training and practices (P. Bowie, personal communications, March 2013). An assumption was that the research problem identified within the local population that was driving this study would not change. That is, the perception of subpar RCAs would not have change by the time that this study actually ended. An assumption was that the RCA training and investigation experiences could be questionable and considered subpar. There still was a concern over the quality of RCA investigations at the time that I completed this current study and presented this evidence based data to the stakeholders and leaders of healthcare organizations.

Limitations

Quantitative data are acceptable means of providing a "higher truth" in learning about the PSOs experiences (Waruingu, 2010, p. 206). However, I minimized the acknowledged pitfalls with survey studies as much as possible. I was able to remove some but not able all limitations. The strategies discussed in the following paragraphs include the problems inherent in a survey designed quantitative study.

Limitations are threats to internal validity of a study (Waruingu, 2012), so careful attention was paid to the method, design, and instrumentation used in the study The PSOs who were targeted to participate in the study could bring inherent biases; thus a limitation of the study (Creswell, 2012). For example, PSOs with the longest work longevity could

be the majority and likely could perceive and report more positive experiences than their less experienced peers' reports. Conversely, PSOs who had negative experiences may be more likely to respond, if they view the survey as a safe way to express complaints.

A potential self-selection bias response to individual survey items also may have occurred. Although I was unable to remove self-selection bias in responding to the survey, I addressed the possibility of bias in the following ways: sampling the entire population, making efforts to maximize participation, inspecting the data, and preparing descriptive statistics that described the distribution of responses. Lodico et al. (2010) concluded that quantitative studies are strongest for validity and reliability if the study participants make up a random sample. Due to the small population size used, the entire sample population consisted of PSOs working for CRL Company at air force bases. To counter the potential biases by encouraging participation, I obtained participation reports from *Question Pro* services and generated reminder e-mails to PSOs who did not respond at 1-week intervals. I examined survey responses to determine the respondent PSOs' demographic characteristics and determined if a self-selection or inherent bias seemed likely. The identified responses are a limitation of the study.

The results had the potential to be generalizable to PSOs at other organizations. However, the small sample population could limit the conclusions drawn based on the data analysis, due to the potential of having a small data set or fewer responses for some individual items. The sample population was small, and it was not reasonable to think that a 100% response rate would occur. The sample size was smaller for Questions 11-13 because only PSOs who conducted a RCA could respond. The sample included both a

census and a noncensus sample. The amount of responses was adequate for previously determined and addressed power analysis and sample size. If the responses had been smaller than the previously determined and addressed power analysis and sample sizes, the data of some responses would have been merged for analysis to occur. Finally, for RQ2, had the number of responses been so small that the data analysis could not determine if a relationship existed between the variables, a threat in determining an appropriate project study based upon study findings would have also occurred.

Another limitation is that the survey tool had a few minor word changes commonly spoken or used in the United States. A risk existed that the word changes could interfere with the integrity of the survey item. Planned pilot testing of the modified survey instrument by colleagues minimized the chance of weakening a proven valid question. Pilot studies and test inform on the feasibility and acceptability of a planned intervention proactively (Jha et al., 2013). However, a lack of statistical analysis on the reliability of the Bowie survey was also a limitation of the instrument.

According to Creswell (2012), the response return rate on a survey study historically is variable. If the response rate is less than what is reported in leading educational journals at 50% (Creswell, 2012) then the findings may not be generalizable to other like populations. The sample population for the study was not as large as the Scotland or Australian studies; therefore, a consideration was to identify strategies to encourage a high return rate. One such strategy was sending friendly reminders weekly by e-mail to the PSOs, asking for their participation.

Response bias occurs in survey research when the responses are not typical of the sample or population from which the sample derived from (Creswell, 2012). A low response rate increases the risk of response bias (Creswell, 2012). A low response rate was a limitation of the study as well because the data were collected by survey method. In contrast, Lodico et al. (2010) reported that interviewing is a stronger data collection method in preventing response bias because the setting encourages instant participant feedback.

Response bias limitations were present for this study; but, a wave analysis of the response occurred on a weekly basis for up to 6 weeks to check and determine if the PSOs responses were similar or are not similar from week-to-week. Creswell (2012) explained that when responses are similar throughout the survey cycle, an assumption is that bias does not exist. If a bias existed, the responses differed greatly from one particular week to another, and that information occurred in the findings of the study as a bias. The result of the wave analysis on the responses for this current study indicated that the PSOs' responses were similar from week-to-week.

Finally, to avoid the risk of response bias, participants' anonymity with their responses occurred as planned. Knowledge that I was the investigator of the study and a colleague of the participants could positively or negatively, influence the PSOs' responses on the survey. As planned, the responses to the survey were made available to me by *Question Pro* services; the identifying information on the responders were not included. Creswell (2012) explained that budget and time constraints might not be a

limitation of the study. I considered the cost of conducting my study to be a negligible hardship because of my personal budget.

Scope

The known scope of the PSO study population was that the PSOs worked for a healthcare organization, the CRL Company, located in the US. They worked primarily under the same company policy, were provided the same level of RCA education, and their work focused on patient safety improvement activities at similar military medical organizations. The medical organizations they worked for provided care to ambulatory patients alone or to combined ambulatory and hospitalized patients. Other variables were reflective of the sample population that occurred from responses to the demographic questions that were a part of the survey instrument.

Delimitations

The population size in the study was bounded or delimited, with 89 possible participants or PSOs identified in the scope. According to Waruingu, (2012), delimitations are threats to external validity and that is a function of the sample size. The population for the study included the total number of PSOs. According to Lodico et al. (2010), survey research sample size should include all possible participants if the total number is less than 200. I sent e-mail reminders to PSOs to ensure maximum participation and responses to the survey and to ensure that external validity was uncompromised.

Protection of Participants' Rights

Protection From Harm

The physical place where the PSOs participating in the study was a low to minimal risk of causing them harm. Psychological stress, unintended disclosure of confidential healthcare records, PSOs' sensitive personal information, social or economic loss, negative health concerns, or unwanted intrusion of privacy or unwanted observations were nonfactors, with the construct of the survey study. I obtained a confidentiality agreement for nondisclosure of information with the statistician and will destroy the data from the survey after a period of 5 years.

Due to an existing peer or supervisory relationship between the participants and the investigator of the study, an additional step taken were to ensure the PSOs did not feel or perceive that coercion occurred as they completed the survey. Anonymity of each participant's response was present for this study because I was the PSOs' program director. While this position does not include hiring authority, control of pay, or work schedule, being the program director could present participant vulnerability ethical concerns. Walden IRB representatives concluded that participants' anonymity was an acceptable alternative to eliminate the vulnerability issue (M. Borja & J. Sherer, personal communication, November 6, 2012). Walden University appeared as the sponsor of the study. *Question Pro* was responsible for contacting the PSOs per e-mail for recruitment in the study. The initial e-mail collectively contained a brief description of the survey, its purpose, the informed consent and confidentiality statements, statement of appreciation for survey participation, the URL hyperlink, and the address to the survey site. *Question*

Pro services sent the reminder emails to PSOs. With the use of *Question Pro*, the identity of the respondent PSOs did not show on their surveys, and were unknown to the investigator.

Informed Consent

Approval from the Walden IRB arrived before the study commenced. The PSOs' employer agreed to assist with the study as described in Section 1. As the IRB required, the PSOs, who participate in the study, understood that participation was voluntary and required their online consent. Statements about consenting, with an explanation on the purpose of the study, were visible and included a clear statement to the participants that their consent implied that if they accessed the link to the actual survey, the directions on how to complete the survey preceded the first question on the survey. The PSOs recognized that their participation could result in improved future professional development, RCA, and other related training. This benefit would be applicable to both the researcher and the participants. The consent document acknowledged protection of participants' rights against human rights violation during data collection.

Confidentiality

The study participants received notice that their identification would be unknown to the researcher or anyone else, and that participation in the study was voluntary without retribution. Confidentiality of participants' responses need protection in survey research (Creswell, 2012). The identity of the PSOs, along with identifying information in any future published reports about the survey, would not occur. The data would immediately disappear from the site 5 years after the survey completion date. This information would

be available to share with the participants in the study before access to the survey occurred and before informed consent obtained. *Question Pro* services agreed to the request that the data responses and survey, excluding the participants' ID information released to the investigator. In addition, *Question Pro* services ensured participant confidentiality on survey responses and their identifications held in strict secrecy.

Quantitative Results

Characteristics of Survey Responses

The dissemination of Bowie survey occurred according to the data collection method described. Access to the online Bowie survey occurred through use of a desktop computer or laptop, smartphones, and tablet devices at 55%, 30%, and 15% respectively per Windows, Android, and Apple platforms. The PSOs familiarity with the survey topic and context could have influenced the less than expected, 9 minutes versus 12 minutes, average time taken to complete the survey. The response rate was highest at onset of the survey and after dissemination of the reminder emails.

Descriptive Analysis

The quality of the RCA investigation outcomes at the local organizational level were an unanticipated problem that was counter-productive in effecting a reduction in patients' harm events, patients' safety, and justifying costs. It was unknown why the problem existed from the perspective of the PSOs who were RCA trained and responsible for the investigations. RQ1 explored why the problem existed by gaining insight into PSOs' self-reported RCA training and investigations experiences. Adult learning assumptions by Malcolm Knowles served as the theoretical base to justify the

development of RQs and exploratory methods used to gain an understanding of the problem. Knowles stated that the adult learning process must consider, in addition to other preparations, the training climate, learner needs, active learning, and an evaluation of the training experiences (Knowles et al., 2011). Hyman and Latino (2014) concluded that, although the RCA was the preferred method of examining healthcare system failures, evidence-based publications were lacking on the methodology and technical performance for conducting an RCA. The need to obtain descriptive RCA analyses from the perception of the PSOs led to the development of RQ1.

Descriptive statistics of PSOs' responses were determined by using frequencies, mode, and percentages. The Bowie survey was a part of the materials disseminated as per the data collection method described previously. Eighty-nine participants voluntarily viewed the online survey; 68 started the survey, but with eight dropouts, those that only opened the survey, the number of completed surveys totaled 60 at a 67% completion rate. One participant's survey submitted did not count in the analysis because it lacked a response on all survey items. The cleaned-up final of 59 PSO participants resulted in a 66% completion rate, spanning 65 of the 74 work sites located in and out of the US. Using Cohen's power analysis table, 64 participants were required to have a .05 statistical level of significance, a .80 power criterion, and a medium effect size at .50. (Cohen, 1992, p. 158). With 59 instead of the 64 anticipated participants, the power analysis for an adequate sample size resulted, using Cohen's power analysis table, by adjusting the level of significance. With 59 survey respondents, a minimum of 50 were required to have a .10 statistical level of significant, a .80 power criterion, and a medium effect size

of .50 (Cohen, 1992, p. 158). Compared with the Scotland study, a 19% higher completion rate occurred with this study.

The PSOs reported training, investigation experiences, benefits, attitudes, barriers, and time since training levels of responses was determined, using descriptive analysis. Due to census sampling, all respondents (n = 59) were PSOs; the majority identified themselves as patient safety managers. Participants were predominantly female, worked in an ambulatory healthcare settings, and the majority were in the nursing profession. The PSOs reported professional affiliation experience was disproportionately higher than the average 3-5 years of reported PSO experience. A summary of the six demographic items shows in Table 1.

Table 1

Participants' Demographics

Characteristic	Frequency Count and (%)
Current Job	
Patient safety	59 (100)
Quality care	0 (0.00)
Risk management	0 (0.00)
Facility	
Medical center	11 (18.6)
Hospital	10 (16.9)
Ambulatory/clinic	38 (64.4)
Gender	
Female	37 (62.7)
Male	22 (37.2)
Years of PSO experience	
< 2	21 (35.5)
3-5	22 (37.2)
6-10	10 (16.9)
11-15	6 (10.1)
>15	0 (0.00)
Years of credentialed experience	
< 2	12 (20.3)
3-5	10 (16.9)
6-10	6 (17.1)
11-15	9 (15.2)
>15	22 (37.2)
Credentials	
Nursing	29 (49.1)
Management/business	16 (27.1)
Medicine	5 (8.47)
Allied health	4 (6.78)
Other	4 (6.78)
Dental	1 (1.69)
Pharmacy	0 (0.00)
Education	0 (0.00)

Of the 59 PSOs that attended RCA training, the majority identified as having formal classroom training or online courses. Their responses aligned with the two day formal classroom course and the self-paced instructional RCA software training that is attended by all PSOs upon hire. The PSOs *time since training* spanned from a few recent months to several past years, but training for the majority of them occurred within the past 2-3 years.

Regardless of the time since RCA training, the training was reported as being valued, beneficial, and 100% of the responders agreed that they had successfully transferred the learned RCA knowledge to their work practices. The PSOs reported levels of agreement on RCA training is further illustrated in Table 2. Table 2 also includes a descriptive display of the responders' positive attitude about the benefits of RCA training.

Table 2

Levels of RCA Training Agreement: PSOs' Experiences, Perceived Investigation Skills, Benefits, and Attitudes

Survey Item	Frequency Count and (%)
Attended RCA training (months)	
Greater than 37	23 (39.6)
Equal to or Less than 6 months	11 (18.9)
12-24	10 (17.2)
7-11	7 (12.0)
25-36	
Training method	
Formal classroom	49 (61.2)
Online/e-learning	23 (28.7)
In-house	7 (8.75)
Nonwork external sources	1 (1.25)
Number of Training Days	
Half day	10 (16.9)
1	12 (20.3)
1.5	4 (6.78)
2	22 (37.2)
2.5	3 (5.08)
3	3 (5.08)
Greater than 3	5 (8.47

Attitudes and Benefits	Definitely	Partly	Unsure	Slightly	Not at all
Understanding/confidence to conduct a RCA	18 (30.5)	27 (45.7)	4 (6.78)	6 (10.1)	4(6.78)
Applied RCA knowledge in my workplace	40 (68.9)	13 (22.4)	1 (1.72)	4 (6.90)	0(0.00)
Changed my reporting and patient safety work practices	27 (45.7)	21 (35.5)	4 (6.78)	5 (8.47)	2(3.39)

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
Better trained in methods to dealing with patient safety incidents	18 (30.5)	30 (50.8)	8 (13.5)	2 (3.39)	1(1.69)
Improve work process for safe clinical care	23 (38.9)	30 (50.8)	6 (10.1)	0 (0.00)	0(0.00)
Contribute to advancements in patient safety	37 (62.7)	18 (30.5)	4 (6.78)	0 (0.00)	0(0.00)
Training benefits worth the investment	26 (44.0)	22 (37.2)	9 (15.2)	2 (3.39)	0(0.00)

Note. $N = 59$

PSOs reported RCA investigation experiences revealed varied agreement levels. When asked if training provided the necessary skills for them to participate or facilitate an RCA, most PSOs responded that they had facilitated an RCA investigation and the majority agreed, at different levels between *definitely* and *occasionally,* that the training had provided the necessary skills to facilitate an investigation. The number of RCAs they had facilitated ranged between 0-5 times. This may indicate that opportunities for PSOs to equally employ the skills learned from training by facilitating a RCA may need to be evaluated. The PSOs also responded that they had unmet needs regarding additional training and confidential feedback after conducting an RCA investigation.

Although the PSOs had reported previously a high post RCA training confidence and skill level on their ability to conduct an RCA, after performing actual investigations they indicated a need for further support. They were unanimous, (*n*=48; 83%), in agreeing that after they facilitated and submitted documentation on the RCA investigation to the organization, a follow-up training session with them would be beneficial. They responded even stronger in agreeing, (*n*=54; 92%), that developmental and confidential feedback on their final draft RCA reports from their colleagues was also beneficial. Table 3 provides a complete presentation of the PSOs' perceived RCA investigation experiences.

Table 3

Levels of RCA Investigation Agreement: PSOs' Experiences, Perceived Investigation Skills, Benefits, and Attitudes

Survey Items	Frequency Count and (%)
Facilitated RCA Investigations	
0	12 (20.03)
1	8 (13.05)
2	9 (15.02)
3	2 (3.39)
4	5 (8.40)
5	4 (6.78)
Greater than 5	19 (32.02)
Participated in RCA Investigations	
0	23 (38.09)
1	13 (18.09)
2	9 (15.02)
3	6 (10.01)
4	1 (1.69)
5	2 (3.39)
Greater than 5	5 (8.47)
Organizational Levels where Conducted, N= 73	
Local work site	48 (65.07)
Operational	13 (17.08)
Divisional	4 (5.48)
Corporate/Headquarters/Agency	8 (10.09)

Attitudes and Benefits	Definitely	Partly	Unsure	Occasionally	Never
Have required RCA Skills from training	26 (44.0)	27 (45.7)	1 (1.69)	3 (5.08)	2 (3.39)
Positive aspects resulted from RCA	33 (64.7)	15 (29.4)	0 (0.00)	3 (5.88)	0 (0.00)

Implemented Corrective Actions	Fully	Partly	Unsure	Never
	20 (39.2)	30 (58.8)	0 (0.00)	1 (1.96)
Desire follow-up training session after RCA investigation	48 (82.7)	5 (8.62)	5 (8.62)	
Desire developmental and confidential RCA feedback	54 (91.5)	1 (1.69)	4 (6.78)	

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
Good use of staff time and resources	28 (47.4)	24 (40.6)	7 (11.8)	0 (0.00)	0 (0.00)
CA team with only clinical staff	2 (3.39)	1 (1.69)	1 (1.69)	27 (45.7)	28 (47.4)
RCA team with patients and relatives	5 (8.47)	11 (18.6)	17 (28.8)	15 (25.4)	11 (18.6)

Note. $N = 59$

The PSOs identified specific barriers encountered during RCA investigations. All eight barriers occurred over the course of conducting RCA investigations, and each occurred over 55% of the time. The overall mean Likert-like agreement level or score for all barriers indicated that PSOs *occasionally* experienced them but a *lack of time* was most frequently reported as *always* and *sometimes* occurring. Information from Table 2 indicated that PSOs favorably reported that the RCA training provided the skills and knowledge for them to conduct RCA investigations, but a training deficit may exist because negative barriers, such as a *lack of time* by the RCA team or facilitator to conduct them, surfaced with every RCA investigation that PSOs facilitate. If RCA training included content on RCA barrier knowledge and solutions to mitigate them, PSOs may be better skilled and equipped in conducting investigations. See Table 4 for details on the reported level of agreement frequency with each barrier.

Table 4

RCA Investigation Barriers, Levels of Agreement Frequency Count and Percentage

Barriers Encountered During RCA	Frequency count and (%)				
	Always	Sometimes	Unsure	Occasionally	Never
Unwilling colleagues, *n* = 50	9 (18.0)	17 (34.0)	1 (2.00)	9 (18.0)	14(28.0)
Unsupportive management, *n* = 51	2 (3.92)	16 (31.3)	2 (3.92)	9 (17.6)	22(43.1)
Lack of resources, *n* = 51	4 (7.84)	13 (25.4)	3 (5.88)	12 (23.5)	19(37.2)
Lack of time, *n* = 51	10 (19.6)	17 (33.3)	0 (0.00)	15 (29.4)	9(17.6)
Interference from internal/external sources, *n* = 50	6 (12.0)	10 (20.0)	3 (6.00)	10 (20.0)	21(42.0)
Difficulty with RCA teams, *n* = 49	4 (8.16)	17 (34.6)	1 (2.04)	11 (22.4)	16(32.6)
Lack of feedback and data, *n* = 50	3 (6.00)	14 (28.0)	2 (4.00)	14 (28.0)	17(34.0)
Interprofessional differences, *n* = 50	1 (2.00)	9 (18.0)	3 (6.00)	25 (50.0)	12(24.0)

Note. N = 59

All of the barriers occur with RCA investigations and some occur more frequently than others. PSOs responded that a *lack of time* existed in conducing RCAs the most frequently at 85% of the time. The PSOs were confronted almost as frequently with *interprofessional differences* among the RCA team (76%). The next two most frequently occurring barriers, by definitions, are associated with the *interprofessional differences* barrier. For example, *unwilling colleagues and difficulty with the RCA team barriers* may be due to the *interprofessional differences* among the RCA team. Other barriers are experienced by the PSOs less frequently but even the least frequently experienced barrier, *unsupportive management,* is encountered over 50% of the time. To address RQ2, the RCA barrier frequencies listed in Table 5 was used to correlate with the descriptive

demographic *time since training* analysis. In descending order, Table 5 displays a summary on the frequency and percentage of occurrences cited by the PSO respondents.

Table 5

Summary of Responses to RCA Barriers in Descending Order of Ascending Order of Encounters

Type of barrier Barrier	Total responses	Barrier Frequency (count, %)	Lack of the
Lack of time	51	42 (82.0)	9 (18.0)
Interprofessional differences	50	38 (75.6)	12 (24.4)
Unwilling colleagues	50	36 (71.5)	14 (28.5)
Difficulty with RCA teams	49	33 (66.7)	16 (33.3)
Lack of feedback and data	50	33 (65.4)	17 (34.6)
Lack of resources	51	32 (62.0)	19 (38.0)
Interference from internal/external sources	50	29 (59.2)	21 (40.8)
Unsupportive management	51	29 (56.0)	22 (44.0)

Summary of Outcomes of the Descriptive Data Analysis

Demographically, most responders had a maximum of 3 to 5 years experience in the patient safety role, but twice the experience in their professional group. The most cited professional group was nursing, followed by management, medicine, dental, allied healthcare, and the business disciplines. The PSOs received training initially in a formal 2-day classroom setting, followed by technical online training on aspects of the electronic RCA documentation tool. Additional or advanced training was a rarity at less than 2%.

By a majority, the time since PSOs had RCA training was 3 years or less, and the percentages were nearly equally dispersed within the listed times spanning from under 6 months, to 11 months, to 1-2 years, and 2-3 years. Only 40% received training over 3 years prior to the study. The time since RCA training aligned with their PSO experience level, which indicated that longevity as PSOs is not common. However, PSOs positively responded that the training confidently prepared them with required knowledge to conduct a RCA, and validated use of RCA lessons learned within their ambulatory, or secondly, hospital worksite setting.

In addition, opportunities to conduct RCA investigations within their worksite were evident, in that over 80% of PSOs had facilitated at least one, 50% had done three, and 30% had facilitated more than five RCAs. From an investment perspective; however, 20% of the PSOs had not utilized their training; this may be an indication of an organization where promotion of a patient safety culture is less than robust. In contrast to facilitated RCAs, most PSOs lacked the opportunity to participate in any post training RCA. A lack of practice opportunities could contribute to the subpar RCA problem. The inability to be a participant in or have an opportunity to facilitate in an RCA could be a missed learning opportunity. PSOs could benefit from having the ability to practice safely or to hone in on learned RCA knowledge prior to the first or next facilitated RCA.

Yet, after conducted investigations, the descriptive data indicated that PSOs had a positive attitude about the benefit of RCA training and their use of RCA process and methods. They reported that the training resulted in developed corrective actions, implemented to promote positive, patient safety. As a majority, they also agreed that

because of RCA training, their investigations are contributing to and advancing safe patient care, and that the time utilized to train and conduct investigation is value added. Their training outcomes aligned with Knowles adult learning principles. If adults have a need for knowledge, they tend to be self-directed and internally motivated for goal attainment during training situations (Knowles, Holden, & Swanson, 2011).

Although PSOs reported that RCAs have resulted in positive aspects resistance in conducting RCAs was prevalent; 100% of the barriers had interfered with the RCAs investigation and outcomes. The worksites are providing some level of patient safety support, because the three least frequently occurring barriers included unsupportive management, a lack of resources, and interference from internal or external sources.

Leadership's apparent limited support was resulting in sustainment of the barriers. RCAs may not be as priority focused as needed within the organization, in order to promote quality investigations as long as the top three barriers and other barriers persisted. The top three barriers were a lack of time to perform RCA processes, interprofessional differences among the staff, and dealing with unwilling colleagues. In addition to subpar RCAs, the barriers might have influenced PSOs' reported desire for confidential and developmental feedback from colleagues on their RCA documents, and for post RCA follow-up training sessions. The existing professional development, ongoing training, and the standardized team communication tools and techniques used were not yielding desired investigation outcomes.

Compared to the Bowie study, some of the findings in this study were similar. For example, ambivalence on the benefit of including patient and family members on the

RCA team was evident between both groups. Although different countries with different healthcare systems, Scotland and America, and with a span of 3 years between the studies, the top two barriers were the exact problems found in both studies; a lack of time and interprofessional differences were the most frequently and most highly agreed upon barriers. In both studies, the participants lacked confidential feedback about their RCA process from a subject matter expert, and both groups believed that the information would be beneficial. A striking difference between the studies, was that the PSOs in this study experienced RCA facilitation opportunities at a higher percent than the RCA trained participants in the Scotland study; 80 versus 55%. Despite that, the PSOs indicated a higher frequency in conducting investigations, and becoming more proficient in the process by practice alone, the barriers persisted. The qualitative aspect and awareness of the PSOs experiences, attitudes, time since training and their perception of RCA benefits, were indicators that there are PSO knowledge deficits. Knowledge about the RCA investigation barriers, or solutions to mitigate these barriers, were absent from the formal RCA course. Not only is the PSOs preservice RCA training incomplete, the organizational and environment support given for a thorough and credible RCA investigation could be problematic as well, because unwilling colleagues was a top barrier as well. In that the top three and other barriers exist, the existing environmental constructs required to complete each step in the RCA investigation and reduce patient harm appear substantive. An opportunity for the employer to explore enhanced training that teaches PSOs means to navigate through the barriers, and an opportunity for the work site leaders within the organization to act as change agents toward barrier

elimination exists. The combined enhanced training and organizational support actions may provide improvement in conducting and heightening the quality of RCA investigations and decrease patient harm events. If experiences continue, stakeholders' comments concerning the subquality and value of RCA investigations and patient harm, reduction measures could likely not change for the positive. These are the similarities between the studies.

Indications from Descriptive Data Analysis

The findings from the descriptive analysis addressed RQ1 and contributed to a greater understanding of PSOs' RCA training and investigation experiences. The PSOs overall perception was that their RCAs training was valuable, and their conducted RCAs were improving the safety of patients and the organizational safety culture. The data revealed that PSOs have supportive training on RCA investigations, and most were experienced as RCA facilitators utilizing the learned training methodology. The data indicated that PSOs obtained organizational support but believe that more feedback is necessary. They had trouble in conducting RCAs due to frequent barriers at the work site. The descriptive findings indicated highly rated preservice training and unsolved RCA investigation challenges. The challenges experienced and barriers perceived by PSOs aligned with the organizational stakeholder's perception of subpar investigations.

Resolution of the barriers could improve RCA investigation outcomes. Actions and interventions should aim at strengthening the PSOs' capacity to manage effectively or to mitigate the most counterproductive or frequently occurring barriers. For example, employer professional development activities such as targeted competency training that

complements existing RCA training and provide solutions toward management of the known barriers is one such action.

Summary of the Correlation Data Analysis Outcomes

Although hypothesized that a relationship exists for RQ2, it was unknown if a relationship between the amounts of time since PSOs had RCA training, and the frequency of barriers they encountered conducting a RCA investigation. To inform if the null hypothesis for RQ2 was acceptable or should be rejected, Kendall's tau-*b* correlational analysis, which is useful in showing differences between small populations or samples, were used to measure the PSOs time since training and frequency of barriers they encountered when facilitating RCA investigations. Information from literature reviews on the topics of transfer of learning, adult learning principles, and performance outcomes were useful to develop the framework for the research question and hypothesis. The correlation analysis occurred only on responses amongst PSOs who had conducted a RCA; the number of PSO respondents ranged from 49-51; the average number of PSOs was 50. The premise was that if a relationship existed for RQ2, a focus on building training, learning transfer techniques, and investigation practices would ensure naturally to address the problem. If the null hypothesis was accepted or rejected, a focus on the descriptive and correlation outcome would define the project for the study.

Correlation analysis. The correlation coefficient, with the *p* value set at .05 or less, for each barrier, was the following: unwilling colleagues [tau *b* = -.191, *p* = .114], unsupportive management [tau *b* = -.160, *p*= .187], lack of resources [tau *b* = -.053, *p* = .656], lack of time (tau *b* = -.243, *p*= .043), interference from internal/external sources

[tau b = .078, p = .519], difficulty with RCA teams [tau b = -.065, p = .596], lack of feedback and data [tau b = -.095, p = .434], and interprofessional differences [tau b = -.109, p = .377] that they experienced conducting RCA investigations. According to Cohen (1988) a correlation coefficients of .10 or less signals a weak association, .30 represents a moderately connected association and a strong relationship exists between the variables if the correlation is .50 or more. Table 6 presents the correlational analysis for the time since training and frequency of the eight barriers experienced by the PSOs.

Table 6

Kendall's Tau-b Correlation: Time Since RCA Training and Frequency of RCA Investigation Barriers, Mean and Standard Deviation

Type of Barrier	Number	Kendall's tau-*b*	Mean and Standard Deviation
Lack of Time	51	-.243	2.92, 1.46
Interprofessional Differences	50	-.109	3.76, 1.08
Unwilling Colleagues	50	-.191	3.04, 1.55
Difficulty with RCA Teams	49	-.065	3.36, 1.45
Lack of Feedback and Data	50	-.095	3.56, 1.37
Lack of Resources	51	-.053	3.56, 1.41
Interference from Internal/ External Sources	50	-.078	3.60, 1.49
Unsupportive Management	51	-.160	3.64, 1.41

The correlation for value, the time since RCA training to the RCA barriers PSOs encountered occurred in the analysis. Kendall's tau-b analysis found no significant agreement or correlation, (r = - 0.243), between the time since training and RCA barriers. Regardless of the time since RCA training had occurred, all barriers the PSOs experienced were at similar frequencies and there was a low probability of association between the variables. There was no significant relationship or differences between PSOs

time since training and the frequency of barriers encountered conducting RCA investigations. Findings from Kendall's tau-*b* inferential analysis for RQ2 indicated that no moderate or strong significant relationship exists between the time since PSOs had RCA training and the frequency of barriers they encountered in conducting a RCA investigation. Since no significant relationship exists considering a *p* value at .05 or less for RQ2, I failed to reject the null hypothesis.

Indications From Correlational Analysis

The researcher held the perception that the majority of PSOs had not facilitated RCAs since training, or they had facilitated a RCA well past the time of training. The delay in conducting RCAs then led to subpar and difficult RCA investigations due to lessons learned, memory losses, and lack of RCA practice. However, the time since training and the frequency of barriers correlation findings did not support my perception. The lack of a relationship between the time since training and frequency of barriers was evident from the correlational analyses. The PSOs' stated confidence in conducting a RCA was not dependent on when they trained. Aligning with Knowles's theory on adult learning, the PSOs apparently perceived a need to know about the RCA investigation process during training. Despite the PSOs time since training and the frequency of barriers, they encounter when conducting a RCA, PSOs still transferred the knowledge and skills learned from training to capably conduct and facilitate RCA investigations.

Results

The descriptive analysis and correlation findings outcome avoided preconceived interventions that aligned with the learning transfer and performance outcomes issues,

such as task repetition, frequency of RCA practice sessions changes, or memory retrieval strategies. Instead, the acceptance of the null hypothesis and descriptive analysis findings indicate PSOs received adequate training, and they were transferring what they learned to the RCA process. The findings indicated that the moderate organizational championing of RCA investigations for patient safety is not adequate to counter the three most frequently occurring barriers; time constraints, unwillingness of colleagues toward supporting the RCA investigation, and interprofessional differences.

Managing interprofessional differences, imposed time constraints, and unwilling colleagues are not part of RCA training, but the CRL Company should address them to affect positively the quality of PSOs facilitated RCA investigations. Common themes and key phrases about the top three RCA barriers appeared in peer reviewed journal articles during a review of the literature. The emerged key concepts used to counter or eliminate the barriers included; interprofessional communication, organizational culture, leadership effectiveness, professional development and competency skills. A project that aims to develop competency skills that prepares PSOs to manage or negate RCA investigation barriers will promote social change. Using Knowles' adult learning assumptions as a guided theory, a professional development activity recommendation to the CRL Company was my project study genre.

Conclusion

To address a problem of subpar RCA investigations, through this descriptive and quantitative survey study, I addressed the RCA investigation experiences of PSOs to find out what perceptions they had regarding their training and practices. This information is

unknown and that was the problem. A descriptive and a correlational question determined that PSOs' RCA training was positive despite the amount of time since their training occurred. There was not a relationship between the time since training and the frequency of RCA barriers encountered by the PSOs. Section 2 on methodology covered the research approach, sampling criteria, setting, instrumentation, data collection, data analysis, the results, limitations, delimitations, scope, assumptions, and ethical considerations. The following section, Section 3, provides the details of the capstone project. They include goals, rationale, literature review, and the project implementation and implication details. Section 4 ends my study. Section 4 provides reflections on the strengths and limitations of the study, provides reflections on my scholarship, provides a self-analysis of my work, and on the expected social change that could develop with implementation of my project study.

Section 3: The Project

Findings showed that counterproductive barriers interfered with PSOs RCA investigations and were negatively affecting the quality of the investigation outcomes. The preservice RCA investigation course met course objectives and goals. Courses included learning about RCA investigations and how to conduct an RCA investigation structurally and methodically. However, the course did not include a component to address the barriers that interfered with conducting an RCA, and that needs a solution before the quality of RCA investigation outcomes can improve. The PSOs' proficiency is low in mitigating the barriers to facilitate a multidisciplinary RCA team's movement toward cohesive interprofessional collaboration. This is required to achieve quality RCA investigation outcomes. The PSOs also struggled with team processes and self-regulating solutions to manage the stakeholders' imposed time constraints given to complete the RCA. This barrier interfered with the quality of the RCA more than the other cited barriers.

A professional development conference workshop is planned to improve RCA investigation practices by targeting the acquisition of competency skills that will aid PSOs in conducting quality RCAs. The selected competency skill training will mitigate known barriers identified from the findings of the descriptive and correlational research. Section 3 includes the project, goals, rationale, literature review, implementation plans, project evaluation strategies, implications for social change, and a summary.

Description and Goals

As a job requirement, PSOs attend an annual patient safety and quality conference. The professional development skill-building competency workshop is planned to complement the conference as a 3-day preconference or postconference workshop. The first day of the workshop will provide an overview of the problem with subpar RCAs. It will outline existing RCA training, describe the RCA study design and findings through the lens of the front line users, detail the barriers against achieving quality outcomes, present competency skills development as a tool to counter known barriers, and provide a competency skill assessment to PSOs. The second day of the workshop will provide individual and aggregated results of the assessment to the PSOs and interactive competency skills training that will include instructor-led demonstrations using the competencies during role-playing scenarios. On the third day of the workshop, small teams of PSOs will conduct simulated RCA investigations on reported events. If the barriers are unknown during the investigation steps, the competency trainers will insert predeveloped barriers into the teams' processes so teams can apply their newly learned skills.

Throughout the simulated investigation process, the competency trainers will observe, coach, and mentor the PSOs on the learned competencies. After all investigations are completed, the team will comment on their experiences. Each team will present their RCA outcomes and receive feedback on their RCA facilitation techniques, use of competency skills, team cohesiveness and communication, and quality of RCA investigation. The workshop will conclude with a summative evaluation. Postconference

coaching calls at 3, 6, 9, and 12 months will occur to further support transfer of learning. The course curriculum will include Knowles's adult learning theory as the learning framework (Knowles et al., 2011).

To promote a decrease in harm to patients with RCA investigation outcomes, the first goal of the workshop will be to inform the stakeholders and PSOs about the organizational barriers that limit PSOs' ability to conduct stakeholder-valued and quality RCAs. The second goal will be to provide knowledge and understanding in use of specific competency skills to mitigate the top three RCA investigation barriers. The third goal will be to provide a practice venue for the PSOs to apply their competency skills in a simulated role-playing environment. The final goal will be to observe and coach the PSOs through an RCA process and provide immediate evaluative feedback to them.

Rationale

Barriers that PSOs experienced in performing RCA investigations were unknown prior to the study, but PSOs knew that their RCAs were often of subpar quality. The study's findings indicated that the PSOs (a) were committed to accomplishing quality RCA investigations, (b) believed RCAs reduced the chance that harm to the patient would occur unintentionally, and (c) had applied the methodology learned when conducting RCA investigations. Data analysis also indicated that PSOs completed training to facilitate RCAs, but they faced significant barriers that interfered with their investigative efforts and undermined the RCA performance outcome. The analysis indicated that the PSOs encountered colleagues who were unwilling participants in RCA

investigations and who communicated ineffectively on an interpersonal level. The main barrier was time constraints imposed on PSOs to conduct RCA investigations.

Prior to this study, no known research had been done on PSOs' experiences with RCA investigations. Therefore, the stakeholders were unaware of these problems, and this lack of information contributed to a learning gap in PSOs' ability to mitigate barriers. Resolution of this learning gap was needed to improve the quality of RCA investigations. Enhancing professional effectiveness through skill building or competency development is customary within organizations through professional development training or programs (Ottow, 2015). Therefore, I created a competency development project that offered an adult learning training platform aligned with a professional development solution.

Barriers interfered with RCA investigations through interprofessional differences. To transform the RCA team members from reluctant participants to an engaged team able to master the time constraints given to complete the RCA, I created a curriculum workshop focused on nontechnical competency skills development in a practice setting. The medical school at Wright State University conducted research with positive results before implementing interprofessional team learning between their medical and nursing students and pharmacy students from a nearby health care organization as a beneficial curriculum approach (Patterson, 2015). As a solution to improve RCA outcomes, the training consists of specified competency skills to enhance the PSOs' proficiency in managing interprofessional differences.

For this project, over 90 PSOs would participate in competency skills development. A spacious training room and a small-group face-to-face learning

environment is needed to mirror the environment for RCA facilitation at the work site . Therefore, the project will be a workshop held in conjunction with a conference. The workshop will be part of the conference because of convenience. An annual training conference will occur because of the company administrators' commitment to staff professional development. The costs of adding a three-day competency skills workshop to an existing funded conference will be minimal because the platform will be available.

Another reason for using a workshop conference is that it will include an environment in which the instructor's demonstration of skills can occur in a skills-building interactive learning environment. In this learning environment, the PSOs will be able to work in teams and apply competency measures during simulated RCA investigations on a patient's harm event. The simulation will include scenarios in which the instructors will introduce the barriers into the investigation so that the team members will be challenged to apply team cohesiveness, interpersonal communication, and time management through utilization of competency skills. The gains should be beneficial because medical health care leaders consider simulation to be a proven educational tool for team and communication skills performance improvement with medical students and residents (Pipas et al., 2016). Using RCA investigation simulation during workshops can provide the PSOs with skills to address the interprofessional differences and unwilling colleagues' issues found with RCA teams and organizational leaders. Through competency development and demonstrated use of the competency skills during the RCA investigation simulation, PSOs will learn to mitigate barriers improve the quality of RCA outcomes at the local level.

Review of the Literature

Ongoing growth and development for professionals in patient safety to handle RCA investigations was a gap addressed in this project study. PSOs will benefit from training that will build their nontechnical professional competencies and skills. Adult education and training includes ongoing development to enable employees to handle future work challenges or changes (Caffarella, 2010). I considered a position paper that would inform the organizational leadership of the barriers that existed and negatively affected RCA outcomes, and would describe how competency skills training would rectify the problem. I rejected this choice as a project study because that solution would have included only a suggestion for a professional development education plan. The added burden for the company to create the curriculum would be unmet. Professional development was a better choice because a position recommendation and an associated competency curriculum would be provided for the company. Companies often sponsor the education for employee professional development purposes individually or as a group project to achieve strategic outcomes (Vella, 2010). The PSOs were already attending an annual educational conference. This provided an opportunity to lower the cost of the training.

There are several types of education and training programs available for adult presentations. Therefore, I conducted research on the various presentation formats before deciding on the particular professional development platform to educate PSOs on competency skills. Common training methods cited by Vella (2010) included seminars, retreats, workshops, job shadowing, lectures, teleconferencing, conferences, web-based

formats, and peer coaching. To achieve saturation of the literature review, I used the following key words: *staff development*, *proficiency development*, *professional presentation*, *nursing staff development*, *conferences*, *workshops*, *competency*, *adult learning*, *transformation*, *experiential learning*, and *employee education*. Databases included ERIC, Sage Education full text, EBSCO, ProQuest, Cinahl, and Dissertation and Theses, Nursing Books from Ovid, and PubMed. I also used the Google Scholar search engine.

Adult Learning, Organizational Performance, and Professional Development

Adult learning principles should guide presentation styles (Foley & Kaiser, 2013; Leis, 2015). I applied these principles in selecting the professional development solution. Knowles's (2011) adult learning theory, as discussed in Section 1, provided the framework for this project. One of Knowles's assumptions was that when adults need to perform more effectively, they are ready to learn in an active learning environment (Knowles et al., 2011). Adult learning targets specific skills that can be used to solve an authentic problem or improve the quality of work performance (Smith et al., 2012).

The measureable result from the learning, if executed and presented according to Knowles's conceptual framework, will be individual performance improvement in RCA investigations. The conceptual foundation used to design the content of the training presentations should include a conducive learning environment and learner participation in developing the learning plan and evaluation methodology (Knowles, 2011). Dean and Ripley (1997) developed a model on an organizational learning system that demonstrated interdependence between organizational and individual performance. Training as a

component of the learning system promotes process improvement. Therefore, when teachers of adult learning methods (professional development training) engage learners through participation, and when the training is similar to the actual work, psychological pressures are reduced and social environment learning increases (Galbraith, 2004; Larsen-Freeman, 2013). Noe (2008) examined training programs and emphasized that the transfer of knowledge from a training environment reflects how the actual work occurs at the work location or within the organization. When key organizational stakeholders engage with the learner in a similar workplace environment, successful transfer of learning occurs (Aluko & Shonubi, 2014; De Feijter, De Grave, Hopmans, Koopmans, & Scherpbier, 2012).

Health care settings provided the work site for the participants of this study. Within health care settings, professional development activities for staff members provide opportunities to develop new professional skills and behaviors (Hagemeier, Hess, Hagen, & Sorah, 2014). Leis (2015) indicated that adults receiving professional education "seem to prefer an informal learning environment and like to be recognized for their present knowledge level and achievements" (p. 25). In addition, adults learn more effectively through interactive presentations involving discussions, demonstrations, and return demonstrations (Daffron & North, 2011; Leis, 2015).

Conferences with PSOs are an important aspect of the training process. Caffarella (2010) described conferences as 1 or more days of educational, informative, problem solving, skill developing formal or informal sessions designed to accommodate large or small groups. Interaction among group members can occur at large conferences, but small

groups are structured to facilitate active and interactive learning (Andersen & Wahlgren, 2015; Rowthorn & Olsen, 2014). A workshop that allows PSOs to work in small groups should provide an interactive training environment.

Professional Development Conferences and Workshops Platforms

A workshop is an example of a small group platform, but other components exist. Workshops are small groups that engage in skill and competency activities in an intense, thought-provoking, participative, and applied environment (Caffarella, 2010; Thampy & Danczak, 2015). The key concept, development, and use of transfer strategies include the ability to take knowledge provided during training and apply the training correctly and efficiently to a job or required work. This ability involves using cognition and behaviors to anticipate, assess, analyze, or map the concept and monitor situations or opportunities effectively in real time (Camp 2012; Fisher & Frey, 2016; Hoyt, 2013; Noe, Sears, & Fullenkamp, 1990; Tseng, Chang, Lou, Tan, & Chiu, 2012).

Conferences that offer lectures with a workshop component provide a higher level of small group interaction and engagement than a conference, which does not include a workshop (Zhuy et al., 2012). Participant interaction, such as through a conference workshop, will be an interactive professional development venue building PSOs' confidence and enhanced reliability conducting RCA investigations. Conferences often occur with a workshop component; the platforms incorporate adult learning theories and contain both large and small training formats that align with professional development goals. This sometimes occurs by dividing all conference attendees into smaller groups or by limiting the number of attendees for the workshop.

Specific reasons undergird the structuring process. The purpose of structuring the learners into small groups is to promote integration of knowledge into an applied skill and work behavior (Brandt & Dimmitt, 2015). Skill-based performance refers to the intentional linking of behavioral acts performed to complete a task in a routine or new setting (Roberson, Kulik, & Pepper, 2009). Skills based learning outcomes can be used to measure or understand if learning or transfer of learning occurred after a conference workshop as intended (Daffron & North, 2011; Furman & Sibthorp, 2013; Saavedra & Opfer, 2012). To assess participant's outcomes, daily formative or a summative evaluation at the end of the conference workshop is a method that can be used to measure learning and transfer of learning.

Exploration of patient safety measures to mitigate unintentional harm from healthcare providers to patients is a focus of some qualitative studies. For example, Varkey, Karlapudi, Rose, and Swenson (2009) conducted a qualitative healthcare study to explore patient safety topics that would be pertinent in building a patient safety module within their graduate medical education program. The participants of the study indicated that technical and nontechnical skills or patient safety competency skills taught interactively and with simulation are preferred learning and assessment methods (Gordon, 2013; Varkey et al., 2009). In my current study I included a workshop plan that was designed to focus on specific nontechnical patient safety competency skills that complimented the technical RCA course instructions. Together, the technical course and nontechnical competency workshop should be effective in negating the barriers PSOs encounter with RCA investigations.

Collectively, conference and workshop trainings are forums of professional development facilitators, often used to provide employees with new knowledge, practices, demonstrations, and also individual simulation opportunities so that the participants can apply their newly learned skills in a training environment (Anderson & Wahlgren, 2015; World Health Organization [WHO], 2011). This concept of operations and intent is professional development. Thus, under the auspices of learning to support an unmet goal of an organization for desired organizational performance, "development refers to obtaining employee expertise through the personal and professional advancement of employees' knowledge, skills, and competencies" (Gilley, Shelton, & Gilley, 2011, p. 386). The structure of the RCA conference workshop for the PSOs may improve RCA investigation behaviors because opportunities to demonstrate, to simulate, and to practice technical and nontechnical patient safety, competency skills will occur.

Studies provided research on competency based professional development. One study using adult learning principles as a framework successfully held a 3-day faculty development Quality and Patient Safety Medical Education conference. The conference included a workshop module. As a result, the faculty's confidence level to teach, navigate through program barriers, and mentor the medical residents improved significantly (Myers et al., 2013). Didactics, demonstrations, peer networking, and role-playing were used to deliver the cognitive and skills building program content. Similarly, Karlsson, Beijer, Erikkson, and Leissner (2008) illustrated positive outcomes from 10 workshops developed by their Swedish Human Service Organization (HSO) for over 70 social work professionals of welfare. The workshop design used by HSO included active learning,

reflection, and self-directed participant opportunities, which resulted in desired knowledge and skill acquisition that built up the welfare workers and HSO's operational capacity (Karlsson et al., 2008). Miller (2014) stated that reflective practices support the ability to learn something new and improve patient safety actions.

The cited works are examples that supported the suitability of delivering education in a conference and workshop setting. Based on the works cited, the goal of the competency development workshop developed for this project study is to provide adult-focused, active learning, and transfer of learned professional development skills, for a large number of attendees who would benefit from small group breakout sessions. Faculty professional development was not a component of my conference workshop plan for this project but is something that I may consider including in a future conference workshop.

Performance Through Competency Training and Development

The survey findings from my project study indicated that key organizational barriers interfered with successful RCA investigation performance, and therefore, quality RCA investigations outcomes. A literature review was then conducted to determine if barrier defusing core competencies existed, and if so, to find relevant information about the utility of the competencies for patient safety officers' function as leader and facilitator of RCA investigations. The literature review explored models of competency curriculum development that fostered mastery of professional skills acquisition. The previously cited databases were useful to conduct the search. Keywords and phrases used for the search included: *collaboration, competency, interdisciplinary, interpersonal, interprofessional,*

healthcare management, business management, curriculum, curriculum development, employee soft skills, facilitator, team communication, team building, conflict resolution, staff retention, coaching, transformation, leadership, organizational management, and *instructional design.*

According to assessments from managers, educators, leaders, and scholars, employees at the management level lacked capable communication skills to solve problems, to overcome barriers, and to evaluate information effectively (Brandt & Dimmitt, 2015; Brazeau, 2013; Eckman & Fry, 2005; Gutman & Schoon 2013;). Web-based competency training on analytical thinking seemed useful to enhance employees' ability as managers. Posttraining needs reduction assessments indicated that the knowledge gap no longer existed, and an evaluation of the managers' ability to transfer successfully and to use the competency to resolve issues identified in online-based, simulation, or practical training scenario improved (Hall, Smith, & Dare, 2014; Rourke & Boyington, 2015; Vyas, McCulloh, Dyer, Gregory & Higbee, 2012). Competency training on analytical thinking specifically promoted the manager's ability to conduct analysis, synthesis, and evaluation within their global work environment (Hall et al, 2014). Inclusion of competencies for managers was a positive finding from a remote and recent global study conducted to promote professional success of managers (Arnold & Forney, 1998; Rowthorn & Olsen, 2014).

Moreover, Lankshear, Kerr, Laschinger, and Wong's (2013) descriptive correlational survey research was conducted to learn about the relationship between organization power and nurse leaders' perception of their roles, ability to influence others

within the organization, and upper management's level of support of nurse leaders. The professional nurse was most successful when they utilized the four key competency domains of practice, leadership, research, and education. However, nurses effectively and frequently utilized "influence tactics" in order to execute various requirements and functions of their role (Lankshear et al., 2013, p. 358). This and other studies found that influence tactics or interprofessional communication is a competency that organizations should include training on and standardize as a necessary professional competency for team communication enhancement and coalition building (Hagemeier, Hess, Hagen, & Sorah, 2014; Newton, Woods, & Nasmith, 2012; Reznick, 2014). Interprofessional communication competency is an included skills training at the conference workshop that I developed for this current project study.

Specific to patient safety, the Department of Defense (DOD, 2014) Patient Safety Program developed a competency model for patient safety managers in 2011 and 2012. The managers of the program identified competency as a standardized requirement in order for a person to perform the work required; thus, the model was a group of standardized skill-related requirements. Using the competency model for managers as a framework, DOD built an award-winning traditional 5-day patient safety professional course for managers and an online patient safety certificate course (DOD, 2014). The online learning course modeled a professional development format with a skills building curriculum. Each course module requires managers' active participation to allow continued advancements toward effectiveness as a lead promoter of patient safety for the DOD healthcare system. The ultimate goal of developing the competency model was a

means to become a recognized organizational benchmark for patient safety improvements and patient harm, reduction strategies (DOD, 2014).

Six competencies and 23 subcompetencies are in the model. Considered as elemental patient safety professional skills, the DOD (2014) identified and defined six core categories for manager's competencies in patient safety. These core categories are: (a) analysis, system thinking, decision making, problem solving, and analytics; (b) business skills and knowledge; teamwork, project management literacy, interprofessional and technology skills, and DOD organizational knowledge; (c) communication; skills in all types; (d) leadership; change management, coalition building, accountable and service oriented for results; (e) patient safety science expertise; and (f) professional development; continuous learning of self and promotion to others (DOD, 2014). Evaluation of the patient safety course occurred over several course cycles. Improvements in the manager's confidence, knowledge, and skills relating to the core patient safety competencies averaged a 24 to 86% increase (DOD, 2014). Other organizations and leading patient safety organizations have also built competency models and PSO specific competency models to improve team communication, elevate and sustain the organization's level of expertise and marketability, and also to support hiring and retention efforts (DOD, 2014; Furman & Sibthrop, 2013; Henry, Holmboe & Frankel, 2013; Holdsworth, Bond, Pariakh, Yacop, & Wittstrom, 2015; Robertson, 2012).

Globally, in 2015 a consortium of renowned leaders from national and international healthcare organizations developed a competency directory for healthcare managers (The International Hospital Federation, 2015). Branded as The International

Hospital Federation, the consortium identified and defined five critical domains in which healthcare managers should have demonstrated competency:

- Leadership: Inspire, create a shared vision and collaboratively direct work.
- Communication and relationship management: Facilitate individual and group team communication.
- Professional and social responsibility: Lead by example with interprofessional conduct; participate in community service, and commit to lifelong learning.
- Health and healthcare environment: Have knowledge of the factors, such as the environment, within the system you work in.
- Business: Apply human factors, systems thinking, and business principles appropriate to the situation (The International Hospital Federation, 2015).

My project study findings indicated that barriers with conducting or facilitating RCA investigations exist and negatively affect the goal of obtaining quality RCA investigations and safer patient care. If the barriers are controlled or eliminated, quality RCA investigations and a reduction in patient harm is expected. The results of the literature review on adult learning, professional development, conferences, workshops, and competencies aligned with my decision to develop a professional training curriculum. The results of the review of the literature on patient safety competencies, technical competencies, organizational management, personal, and interprofessional competencies support my decision to develop the RCA investigation competency curriculum for PSOs.

Once developed, the focus will shift to implementation of professional development training.

Project Description

Completion of the project will finalize a milestone that will potentially open the pathway for project execution within the CRL Company. To initiate, I will schedule a decisional conference call with the president of the company, chief human resources officer, and chief operating officer, and will send them copies of the project study and the training plan for professional development training plan two weeks before the planned conference meeting. I will send a one-page summary of the project study and budget estimates to the stakeholders for their awareness. My availability to answer questions or respond to comments about the project will be a part of the awareness information provided. I will also attach a cover memo on the documents. Once a decision to proceed in implementing the training program occurs, and leaders of the company obtain mutual support from their external stakeholders to have the competency development workshop, I will use as a guide, Caffarella's Interactive Model of Program Planning Checklist.

The checklist is a logistical task list to complete within the first 2 weeks after project approval, and I plan to enlarge it for use as a posted visual process flow map. A series of lectures by patient safety experts on RCA investigations and competencies, technique demonstrations, simulations per live actors' role modeling or per video clips, and question and answer sessions at the end of each lecture and day, illustrates what the daily workshop proceedings will look like and on which evaluations will occur.

Potential Resources and Existing Supports

With support garnered from the CRL's human resources office, completion of the workshop preparatory tasks dissemination will occur sensibly among selected CRL company employees. The potential resources and supportive measures for the project implementation include: (a) using the bank of staff members and PSOs of the company to selectively chose top patient safety experts as speakers and coaches; (b) establishing room monitors, marketing agents, an administrative support team, audio-visual support team members, and an office supply and equipment support team; (c) identifying guest speakers who may have volunteered pro bono as other subject matter experts; (d) identifying staff at the site where the conference and workshop will be held for media and room support; and (e) using volunteers to haul and transport heavy or bulky supplies, materials and equipment to and from the conference workshop each day.

Potential Barriers

Without approval of the professional development project, the conference workshop cannot move forward and that is the immediate barrier. The conference and workshop is a fiscal venture. Unexpected company or stakeholder budgetary issues may surface and require a cancellation of the conference and workshop or force a reduction in the number of planned days. In that the company is a consulting business, stakeholder changes may occur and may affect the significance to follow through with the conference workshop. With changes in the weathers it would be unheard of to have a weather related delay or cancellation. From a national security perspective, a terrorist threat or actual

incident may negatively influence the PSOs' air flight, travel plans that would be necessary for them to get to the conference workshop location.

Proposal for Implementation and Timetable

The workshop's target date will be in conjunction with the annual conference held in a certain month each year. Project implementation will begin with a competency assessment at the beginning of the calendar year. As part of the employee retention program of the CRL Company, proactive online competency assessments dissemination will occur, and immediate feedback will follow in an online format within the first three months of the year. All PSOs will participate. Nine calendar months will be available to plan the project. I will form a training committee and we will conduct monthly conference call commencing six months before the planned conference date. The calls will increased to twice weekly, 3 months before the conference date, before becoming weekly calls one month before the conference date of that particular year.

Roles and Responsibilities of Student and Others

The roles and responsibilities for the PSOs, as students, will be to engage and learn actively from the workshop sessions, and although the conference program does not relate to the workshop, the students are required to learn from the conference as well. Prior to the conference, the students will be responsible for completing an online competency assessment module to provide guidance on their learning needs, and students will also participate in post-training evaluations and interval coaching calls. At the conference workshop, nine students will serve as speakers and coaches for the workshop. These students will be responsible for being organized and ready to present their topic,

and will be responsible for demonstrating or simulating the competencies correctly. As speakers, the PSO students are also responsible for being friendly and attentive to the workshop students. Because the student selected to assist with the training are in an instructor's and facilitator's role; a responsibility to prepare their educational lesson plan, presentation slides, and handouts 6 weeks before the conference date is also required. I will serve the role of project coordinator and manager throughout the planning and will be the point of contact. The planning, activities, learning aids, role expectations, and responsibilities are under the auspices of Knowles's adult learning assumptions.

The project officers of the company and human resource officers will function as motivators to encourage students to learn during the training. They will be training committee members and help manage and coordinate the conference workshop. To understand what the students will need to learn and what their experiences are, the students will be responsible for spearheading the online competency assessment, and for assisting with the post conference coaching calls. The company president will serve as the decision point if situations surface that need resolution at a level higher than what I can provide as the overall point of contact.

Project Evaluation

Type of and Justification for Evaluations

Evaluations are integral to the planning of projects and programs to determine if what was conceptualized to occur actually is obtained, implemented as planned, validated, and if new behaviors exist and are sustained (Caffarella, 2010, Grohmann & Kauffeld, 2013; Hunter & Nielson, 2013; Koo & Milner 2010, Noe, 2008; Weick &

Sutcliffe, 2007). Observations of the PSOs' ability to apply competencies during simulated RCA investigation, and self-assessment of RCA investigation are the means that will provide an assessment of PSOs learning experiences and perceptions about the workshop conference. At the end of Day 1 and Day 2 of the workshop, the PSOs will complete a short formative, quantitative evaluation to assess their reaction to the workshop. The PSOs are to select the response that mirrors their thoughts, using a Likert style level of agreement design. The goal of the daily evaluations is to meet Knowles's learning assumption that adults are oriented to learning, based on internal factors that are immediate in helping them get the job done (Elghouche, 2015). To achieve practicality and relevancy with the training for the PSOs, within the first two hours after Day 1 of the workshop ends, the workshop committee will meet. The committee will review all evaluation responses, and if issues emerge, the committee will address the issue for immediate reconciliation. For example, if the evaluation finding on Day 1 indicates that, by majority, the PSOs disagreed that role-playing was effective, using guided research and shared knowledge, adjustments or new steps to the role-playing activity will be evident on Day 2. The evaluation will also validate what is working. If there are no issues with Day 1 proceedings of the workshop, the plan will not change for Day 2. In addition, the PSO will have opportunities to comment on the competency demonstrations and RCA investigation simulation. The instructors will also conduct formative evaluations on the PSOs understanding and use of competencies during the simulation exercise. The intent of the planned formative and summative evaluations is to give a perspective for what

Kirkpatrick and Kirkpatrick (2010) asserted as evidence that changes occurred for the bottom line goal.

Summative evaluations provide an overall assessment of the entire three-day workshop. This evaluation will occur at the end of the workshop. Collectively, the evaluations are a roadmap for future workshop successes. As a roadmap, the information from the PSOs' evaluations will be useful to redesign, update, eliminate, and structure objectives and goals of the next annual workshop. Included also will be summative competency skills and transfer of learning evaluations by the lead instructor at each of the four-post workshop. Coaching calls with the PSOs will occur, as necessary. Finally, the competency assessment will reoccur from three to four months prior to the next workshop for the PSOs' interest and the workshop committee's insight for planning purposes. Although it will be an inaugural workshop, the plan is that the company will continue to sponsor the workshop annually or until such time that the needs or workshop priority changes.

Overall Project and Evaluation Goals

The workshop goal is that through competency development and demonstrated use of the competency skills during the RCA investigations, mitigation of the barriers is expected to occur during simulation, and the quality of RCA outcomes at the local level will improve due to the PSOs ability to facilitate the team. The following learning outcomes used to develop the instructional plan will be useful for evaluating the workshop. Upon completion of the workshop, the PSOs will be able:

- To specify the barriers that PSOs encounter when facilitating and conducting stakeholder required RCA investigations.
- To verbalize taught PSO competency skills definition and associated behaviors.
- To translate how effective use of competency skills results in higher functioning, team cohesiveness, and communicative efforts as a means to counter the barriers.
- To simulate an RCA investigation process using appropriate competency skills as behaviors to reduce effect or eliminate encountered barriers.
- To endorse confidence in being able to successfully improve RCA investigation performance outcomes.

Moskowitz and Nash (2007) concluded that a student's application of critical analysis could occur in terms of the outcome of the interaction. In addition, a student's application could determine if the student applied the evidence presented. The interval coaching calls will determine during RCA investigations if the PSOs maintained ongoing competency confidence, controlled or mitigated barriers, and if the stakeholders informed the PSOs of having a better appreciation of the RCA investigation outcomes. Coupled, the formative and summative evaluations will shape adjustments to the competency-training module. The evaluation will be useful as an instructional aid reference prior to the next annual conference workshop.

According to Coloma, Gibson, and Packard (2012) stakeholders need to know if the training worked. Stakeholders want to know if the participants acquired knowledge

and skills will make a positive difference in performance outcomes. Stakeholder awareness of the workshop evaluations will occur in a formal report and if a favorable report results, the stakeholders have the authority to develop further strategies and tools that will strengthen organizational reliability (Chassin & Loeb, 2013). For the purpose of this study and project, organizational reliability will result in improved RCA investigation outcomes that promote patient safety and harm reduction strategies. That is, did the PSOs' new knowledge and skills acquired from the conference workshop contribute to improved performance and desired RCA investigation outcomes? The stakeholders are the board of directors and organizational leaders who has oversight of or employs the PSOs.

Implications Including Social Change

Local Community

Patient safety management and initiatives, as a separate domain within the quality and risk management disciplines in health care, is relatively new with a start from the national level in 2001. Using root cause analysis investigations to decrease harm events to patients is standard work. If this project delivers in removing or reducing the barriers known to influence negatively RCA outcomes, the potential exists for PSOs ability to better facilitate RCA investigation, achieve stronger interventions, and prevent future patient harm. Patient harm is a national healthcare issue, and the literature review suggested that other organizations struggle with quality RCA outcomes and benefits. Sharing the evidence from this study on indicators that dampen the investigative efforts and sharing an evidenced based RCA skills building workshop for PSOs that may

promote alleviation of negative barriers suggests that, if adopted, safer healthcare for patients in the local community is possible. Focused workshops on building capacity to facilitate RCA outcomes are important for the chief operators, boards of directors, and education and training or human resource department leaders. The focused workshop developed for this current project study addressed the needs of the PSO learners as well as the stakeholders and the executive leaders of the CRL Company. If implemented, families and patients at the local organization may be predisposed to lowered risks for unintended harm events. Stakeholders may find the project important enough to adopt for that reason alone. A program is recognizable when patient safety activities have progressed in performance because barriers can surface that impede the work of professionals to address successfully (DOD, 2014).

Far-Reaching

The Institute of Healthcare Improvement (2013) offers patient safety, quality, and performance improvement courses that advocate incremental expansion of a new process so that health care professionals can study the process and make necessary adjustments for reliability (IHI, 2013). The evaluations of this project study could follow the same path and reach further than the local level for implementation nationally or internationally at similar health care systems. For instance, if the project study and the workshop program deliver as a successful project at the local level as evidenced by a progression in performance of patient safety RCA investigations, the project study may extend with the same success at local community healthcare organizations. This could include a healthcare system at the state level, or it may be possible that other similar organizations

will model RCA competency skills workshops throughout the country. The far-reaching implication of having successful RCA training and competency-based skills workshops could mitigate or decrease the frequency of the responses identifying investigation barriers encountered by the PSOs at the CRL Company. The study could lead to standardized professional development training within the CRL Company. Other health care organizations could adopt similar professional development training. These implications could increase the quality and outcome of RCA investigations.

Conclusion

In Sections 1 and 2, RCA investigation outcomes represented a problem at the local level, and the descriptive and inferential statistics of my quantitative study indicated that PSOs faced organizational barriers while conducting RCA investigations. Section 3 was an extensive literature review on this newly emerged finding, explored options that built capacity for PSOs to conduct quality RCA investigations, and described how an organization's conference workshop on competency skills development and application could apply to change PSOs performance in effectively facilitating the RCA team despite barriers. As a result, the quality of the RCA investigations may no longer be a common problem. The scope of the workshop and the evaluation strategies concluded the information provided in Section 3 of the project study. Curriculum details on the competency skills building RCA workshop are located in Appendix A. Expounding on reflective assessments about my project study journey, such as the scholarship and strengths of the project, and the overall conclusion of this project follows in Section 4 of the study.

Section 4: Reflections and Conclusions

The capstone project started with an identified problem at the work site that influenced the success of a patient harm-reduction strategy known as root cause analysis investigations. Data analysis indicated that organizational barriers existed with investigations and PSOs needed training to manage them efficiently. To identify optimal solutions to improve investigations, I conducted research on outcome-based, proven practices and program development methodologies. I designed a project to develop PSO competency skills to improve RCA outcomes. I created a PSO professional development competency-focused curriculum to enable PSOs to mitigate barriers during RCA investigations. Section 4 includes reflections on the project study, future research, and my development as a scholar, practitioner, and project developer. I conclude with a summary of my project study experiences.

Project Strengths and Limitations

During the first year of my literature search for the prospectus, I did not find any studies on patient safety officers' experiences with conducting an RCA investigation. At the end of the second year, I found a study that was a follow-up to a previous study published about 5 years earlier. Both of the studies had been conducted in the United Kingdom. The fact that the two international studies related to my study was a significant strength for my project because a preestablished survey had been used in these studies. The preestablished survey was reliable to assess RCA investigation experiences. I was able to stop development of an invalidated survey, which strengthened my project. The two international studies also indicated that the return on investments

(ROIs) of conducting RCA investigations was probable but unproven. My project study is adding to the limited literature on RCA investigation problems a solution that may create a worthy social change opportunity at the local level. Data collection from the survey occurred with participant anonymity because all participants worked for the same company in which I held a supervisory position. Anonymity promoted a protected environment for candid and unbiased PSO responses. I also discovered that anonymity promoted a higher response rate. The findings from the data included descriptive and inferential statistics that were statistically significant.

The comprehensive literature review on all aspects of education and training programs, employee professional development, and evidence-based practices strengthened my selected project. I was able to share the data analysis, findings, and implications of the study with the participants via a webinar within a reasonable timeframe. I took an opportunity during the webinar to thank them personally for their participation. One part of the project was skill development to address barriers in RCA investigations. The study site company offered two products that were critical elements of my project. The two products were an annual conference and the competency assessment tools the human resources division used for hiring and retention initiatives. The existing products provided a platform for optimal education and training on a very low budget. Another unexpected project strength was the likelihood that the company would implement the training. This project strength occurred because a twofold benefit existed for the company. First, the PSO professional development training on competency skills could be included at the next annual conference workshop. The other

strength was that the workshop curriculum and follow-up coaching calls were accessible to the company for employee retention and performance improvement efforts and for promoting transfer of learning. Limitations of the study were that it did not include qualitative data, the sample size was not large, and it did not include survey data from the organizational leaders.

Recommendations for Alternative Approaches

The quantitative approach was a limitation because the opportunity to capture participants' experiences in their own words was not an option. If a qualitative component had been included in the study, data analysis would have been richer and more informative. A mixed-methods approach would offer both qualitative and quantitative data. Although the sample size was adequate for power analysis, the size was a still a limitation. In future studies, a mixed-methods approach and a larger sample size would be a priority. A larger population from multiple sites would provide more generalizable results, and this would be useful to the stakeholders. Future studies could include support from other health care organizations.

To address the problem differently, researchers could include the organizational perspective along with the PSOs' input. Managers' and executives' experiences could be included in future correlational studies. These studies would add another layer of understanding because both perspectives could generate findings that otherwise would not be discovered. The social change impact could be strengthened if the studies occurred in the described ways.

Scholarship

The doctoral program has been a welcome journey in scholarship. I was not racing to finish. I developed critical thinking skills, writing skills, communication skills, knowledge, and skills as a principal research investigator. I learned about adult learning from the Walden University staff and from my readings as an active learner. The doctoral program enhanced my ability as a scholar. I learned that scholarship is about solidifying practice, education, and theory through an evaluation process known as research. I learned that scholarship has resulted in unintended discoveries that positively changed the U.S. health care industry. Scholarship improved my way of thinking and reacting. For doctoral studies, commitment and time are necessary to obtain scholarship (Braithwaite et al., 2006). I learned that I was passionate about developing higher ordered thinking and being a proven scholar. Conducting scholarly research required an enormous commitment of time and money. That was not a deterrent; I learned that I valued scholarship and being a researcher.

Project Development and Evaluation

An enlightening moment about project development happened when I realized that my project study format determined the structure for what the curriculum and presentation style would be for the project. Caffarella (2010) cited this factor, but it became clear to me while I was developing my project. For example, if I had developed a project guide on competency development to improve RCA investigations and presented it as online education, the curriculum would have included content and active-learning processes that would have been different than if the training had occurred, face-to-face at

a conference workshop. I learned that there is a plethora of information about evaluation methods, selection considerations, and implementation steps. A misstep should not occur with the planners because they, along with the stakeholders, collaborate in choosing the evaluation process. I have surmised that the ROI can be enhanced if evaluation of the project is mindful at the onset of the project development stage.

Leadership and Change

The stakeholders were interested in evidence-based practice and research, but were not supportive of the prolonged time it took to complete the study as prescribed by Walden University. Stakeholders were not as interested in allowing the study to follow academic steps for degree purposes because their goal was to correct problems as efficiently and as quickly as possible. Research is not a quick process; the stakeholders were resistant to research in favor of other performance improvement processes that required fewer steps or less time to accomplish. Despite the reliability and validity of the project study, I also learned that the stakeholders could choose which findings and implications they wanted to adopt early and determine which ones that they would reject. Stakeholders were more apt to select changes with the least amount of fiscal requirements and those that were easiest to implement. For example, policy development and reminders to the staff were changes easily embraced. Requesting new surgical instruments or removing a surgeon's favorite but at-risk instrument from use was unlikely because it would require engagement from directors or the board for approval or action.

Analysis of Self as Scholar

Within the first 10 years of my professional nursing career, the organization in which I worked advocated nursing research. Opportunities to acquire knowledge and conduct research studies only required an interest. My exposure to nursing research projects began as an assistant investigator. The experience was pleasurable, entertaining, and stimulating. After 10 years, I began graduate school to receive formal training to conduct research in nursing as the principal or lone investigator. My studies focused on clinical nursing laboratories and the need for education and training. The love for education and research continued as I matured professionally. For example, I did not miss any learning sessions when I attended nursing conferences. I came back with the maximum educational time possible and had little time or interest in anything outside of the conference rooms. I shared my background to say that I enjoyed lifelong learning and research.

I learned everything about adult learning from the Walden University staff and from myself as an active learner. The doctoral program enhanced my ability as a scholar. An outcome of completing the doctoral program was that I began to consider myself a scholar. I realized this after participating in classroom discussions; reading numerous academic documents, articles, and books; and conducting many hours of study and self-reflection. The learning deficits of which I was unaware were frustrating, but they contributed to my academic development because I gained a deeper awareness of who I was and what I wanted to do to improve socially. As a scholar, I learned that although I

was successful with my job, I had so much more to learn. Upon graduation, I will be in a position to start teaching other adult students about scholarship.

Analysis of Self as Practitioner

I started doctoral studies with a belief that my background in educating female adults about women's health would enhance my ability to succeed in the adult education program. I was able to reflect on prior experiences as a practitioner; but, I also learned how to improve the manner in which I educate adults in my practitioner role. For example, presenting my oral proposal defense felt very natural for me. I believe that is because, as an instructor and nurse practitioner, I often engage in one-on-one interaction with adult patients and adult students. I have modified, restructured, and improved how I instruct students during RCA training courses and how I teach patients aspects of their care. Having completed this educational quest, I feel I am a more efficient practitioner because I am able to understand and apply adult learning theories during patient engagement and during RCA investigation facilitation.

Analysis of Self as Project Developer

Growth has occurred as a project developer, although I have been a project developer for nursing conferences and workshops in the past. I learned that the on-the-job training I received as a project planner aligned loosely with the grounded research methods cited in this project study. Project development was one of my strengths at the level that was required in previous roles and responsibilities. Now I am in a position to recognize and bridge gaps that may occur while creating and managing a project that results in excellent performance at the local level.

The evaluation process of a project is one example of a lesson learned. It was important to create an evaluation plan that could be used to determine whether the project was meeting stakeholders' goals. Before completing this project study, I had not considered any type of criteria for selecting an evaluation method. A second area of growth was that I did not include an evaluation plan as an initial part of my program development. This oversight was a part of the correction as I developed my project study. I learned that as a project developer, I had to know when and how the evaluation plan should occur.

Implications, Applications, and Directions for Future Research

RCA investigations are a critical part of the PSOs' duties, and the goal of the investigations is to avert future patients' harm. The lack of research on the benefits of RCA investigations in the health care field was a challenge. Within my organization, the stakeholders' opinions were that the quality of RCA investigations must improve to prevent future harm to patients. I learned many things by conducting the project study. I gained an understanding of why the problem existed. The study findings indicated that the PSOs believed that the training prepared them to conduct investigations, but they had a problem with barriers that impeded their RCA investigations. The primary barriers were limited time for the team to meet, colleagues' unwillingness to support the RCA process, and the interprofessional differences among staff and team members.

These competing issues negatively affected the RCA investigation outcomes. Evidence in the literature supports interprofessional education as a means used to avoid turf battles; confident interactions and baseline communication skills yield interactive

trust and respect among interdisciplinary healthcare teams (Buring, Bhushan, Broeseker, & Conway, 2009). When interprofessional collaborative performance improves within a healthcare organization, patient care quality also improves (Buring et al., 2009; WHO, 2011). An understanding of this position led to the IOM, WHO, and the American Public Health Association endorsements of educational competency programs (Buring et al., 2009; WHO, 2011).

Potential Impact of the Project on Social Change

Finding out about the barriers within the organization brought situational awareness to the stakeholders and PSOs, and provided an opportunity to correct problems and to improve RCA investigations. A training program that would build PSOs competency skills to improve their performance in facilitating the investigations included a planned presentation as a conference workshop. If the investigations improved the quality of RCAs, the impact on social change would benefit the patients at the local level, and patients would receive safer health care. The impact on social change would also benefit the human resources office because employees would have access to a fully developed and researched curriculum with a presentation plan. If implemented in other health care sites, the potential existed that competency training would be a part of the RCA courses at many health care organizations.

Recommendations for Practice and Future Research

Understanding why something negative or counter-productive exists is critical to finding and implementing the correct solutions regarding knowledge transfer (Green, 2012). This study added to the body of knowledge on two similar studies that occurred

outside of the United States. A finding was that the top barriers in both studies were almost identical. Sharing the results of the project study and professional development competency curriculum and solutions could be of benefit to health care organizations outside of the United States. Applications to the adult learning and patient safety field could include the following:

1. If the curriculum plan and this presentation platform solution occur at more than one site, and were effective in building capacity for PSOs facilitation effectiveness, reduced patient harm universally could occur as a social change.
2. As an alternative, other healthcare organization easily could adopt the study design and first collect data on their investigator's experience. They would then use the results of their survey to drive their social change. If the same barriers existed, the preestablished curriculum could be applied easily, or a modified plan could address a particular desired competency skill.
3. The conference workshop and curriculum plan is also portable. The training can occur in other than a conference or workshop platform without compromising the objectives or lowering costs.

Future research to build upon the new knowledge and solution is an exciting option that I would like to someday pursue or help another scholar to study. Another research or project study, designed as large scale, multi-site study, with an added qualitative section, could add to the body of knowledge on RCA investigations. The

study could indicate if the effect of an intervention, PSO competency development to improve facilitation performance, could improve RCA outcomes. It would also be interesting to obtain qualitative data about the specific time constraints that the PSOs encounter, determine how and why the colleagues behave or display an unwillingness to support RCA investigations, and determine what specific roles or job positions show the influence of negative and difficult interprofessional communication.

The research study design and data collection process may serve as a mixed-methods or qualitative study in one of two ways. One design could include adding three open-ended questions about the RCA barriers to the existing survey, and use the findings to tailor or expand on the curriculum plan of the conference workshop. Instead of modifying the survey with open-ended questions and risking the reliability of it, adding an interview component to the pool of survey data is also a recommendation. Once analyzed, all data adjustments could apply to the curriculum plan.

As applied in this project for teaching professional development and competency skills building, workshops and conferences represented a rich medium for a learning platform. The competencies that were effective to negate the barriers with RCA investigations fell broadly under the category of communication and teamwork. Developments of these two competency tracts for health professionals represented the core of the patient safety curriculum as a mean to enhance PSOs' practice (TJC 2015, IPEC, 2011, Interprofessional Education Collaborative Expert Panel, 2011). Virtual simulation or gaming learning environments with or without avatars are revolutionizing education and training paradigms and has interest of some medical school programs

(Foronda, 2016). Interprofessional communication via virtual simulation or gaming could be an option to consider when conferences or workshops are not fiscally or easily feasible for the organization to conduct. This type of simulation could also be an application to use for PSO and other healthcare providers training when a large contingent of staff need constant training. Future research and project studies are in order.

Conclusion

Section 4 presented insight about my experiences and attitudes about the project study as a love and a hate journey. The love was the academic role and the hate was all the obstacles and delays along the way. I would easily do it over again but hope to help others to complete this journey. Through mindful reflection, I believe that in conducting the study, I used sound research applications for credibility and reliability, and that it addressed the problem and purpose of the study on RCA investigations sub-quality issue. The findings of the study were telling, and the solutions to mitigate the problem included research and evidence-based practices.

My personal journey to complete this project study occurred, using past experiences, which were mostly strengths. I learned how to be a scholar of research and to develop an educational program. I concluded Section 4 with examples of how the study can continue with future mixed-methods research, and how findings from this study were similar to previous international studies. I stated that the knowledge and lessons learned from this study could possibly promote local social change, or higher, within healthcare organizations.

References

Agency for Healthcare Research and Quality. (2008). *New AHRQ study finds surgical errors cost nearly $1.5 billion annually.* Retrieved from https://archive.ahrq.gov/news/newsroom/press-releases/2008/surgerr.html

Agency for Healthcare Research and Quality. (2014). *AHRQ's efforts to prevent and reduce health care-associated infections.* Retrieved from http://www.ahrq.gov/research/findings/factsheets/errors-safety/haiflyer/index.html

Aluko, F., & Shonubi, O. (2014). Going beyond Kirkpatrick's training evaluation model: The role of workplace factors in distance learning transfer. *Africa Education Review*, *11*(4), 638-657. doi:10.1080/18146627.2014.935007

Andersen, M., & Wahlgren, B. (2015). Conference evaluation focusing on learning and transfer. *Journal of Multidisciplinary Evaluation*, *11*(25), 34-50. Retrieved from http://journals.sfu.ca/jmde/index.php/jmde_1/article/viewFile/436/407

Arnold, E., & Forney, J. (1998). Professional competencies of successful international textile and apparel marketing and merchandising. *Journal of Family and Consumer Sciences*, *90*(2), 43-49. Retrieved from http://www.aafcs.org/Resources/Journal.asp

Baldwin, T., & Ford, J. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, *41*(1), 63-105. doi:10.1111/j.1744-6570.1988.tb00632.x

Bates, R., Holton, E., & Hatala, J. (2012). A revised learning transfer system inventory: Factorial replication and validation. *Human Resource Development International, 15*(5), 549-569. doi:10.1080/13678868.2012.726872

Bishop, K., & Johnson, D. (2011). The effects of ability, perceptions of ability, and task characteristics on proximal and distal performance outcomes over time. *Human Performance*, *24*, 173-188. doi:10.1080/08a59285.2011.554136

Bowie, P., Skinner, J., & de Wet, C. (2013). Training health care professionals in root cause analysis: A cross-sectional study of post-training experiences, benefits, and attitudes. *BHC Health Services Research*, *13*(50), 1-10. doi:10.1186/1472-6963-13-50

Braithwaite, J., Westbrook, M., Mallock, N., & Travaglia, J. (2006). Experiences of health professionals who conducted root cause analysis after undergoing a safety improvement program. *Quality and Safety in Healthcare*, *15*(5), 393-399. doi:10.1136/qshc.2005. 017525

Brandt, C., & Dimmitt, N. (2015). Transfer of learning in the development of peer tutor competence. *Learning and Teaching in Higher Education: Gulf Perspectives*, *12*(2), 1- 17. Retrieved from http://lthe.zu.ac.ae

Brazeau, G. (2013). Interprofessional education: More is needed. *American Journal of Pharmaceutical Education*, *77*(9), 184. doi:10.5688/ajpe77918410.5688/ajpe779184

Broad, M., & Newstrom, J. (1992). *Transfer of training: Action packed strategies to ensure high off from training environment*. Reading, MA: Addison Wesley.

Buring, S., Bhushan, A., Broeseker, A., Conway, S., Duncan-Hewitt, W., Hansen, L., & Westberg, S. (2009). Interprofessional education: Definitions, student competencies, and guidelines for implementation, *American Journal of Pharmaceutical Education*, *73*(4), 1-8. doi:10.5688/aj730459

Button, M., Mathieu, J., & Zajac, D. (1996). Goal orientation in organizational research: A conceptual and empirical foundation. *Organizational Behavior and Human Decision Processes*, *67*(1), 26-48. doi:10.1006/obhd.1996.0063

Caffarella, R. S. (2010). *Designing and assessing learning experiences: Planning programs for adult learners: A practical guide for educators, trainers and staff developers*. San Francisco, CA: Jossey-Bass.

Camp, D. (2012). Here, there, and anywhere: Transfer of learning. *Critical Questions in Education, 3*(1), 35-42. Retrieved from https://www.academyforeducationalstudies.org

Chassin, M. R., & Loeb, J. M. (2013). High-reliability health care: Getting there from here. *Milbank Quarterly*, *91*, 459-490. doi:10.1111/1468-0009.12023

Chen, G., Gully, S., Whiteman, J., & Kilcullen, R. (2000). Examination of relationships between trait like individual differences, state like individual differences, and learning performance. *Journal of Applied Psychology*, *85*(5), 835-847. doi: 10.1037/0021-9010.85.6.835

Clardy, A. (2005). *Andragogy: Adult learning and education at its best? Report. Online submission*. Retrieved from http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED492132

Classen, D., Bates, D., & Denham, C. (2010). Meaningful use of computerized prescriber order entry. *Journal of Patient Safety*, *6*(1), 15-21. doi:10.1097/PTS.0b013e3181d108db

Cohen, D. (2014). Emerging challenges for patient safety: Opportunities for our finest hours. *Patient Safety and Quality Healthcare*, *11*(6), 20-24. Retrieved from http://www.psqh.com/analysis/emerging-challenges-for-patient-safety-opportunities-for-our-finest-hours

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155-159. doi:10.1037/0033-2909.112.1.155

Coloma, J., Gibson, C., & Packard, T. (2012). Participant outcomes of a leadership development initiative in eight human service organizations. *Administration in Social Work*, *36*(4), 4-22. doi:10.1080/03643107.2011.614540

Cornell University School of Law. (2012). *Title 10 Armed Forces Code 1102*. Retrieved from http://www.lsw.cornell.edu/uscode/uscprint.html

Cowan, C., Goldman, E., & Hook, M. (2010). Flexible and inexpensive: Improving learning transfer and program evaluation through participant action plans. *Performance Improvement*, *49*(5), 18-25. doi:10.1002/pfi.20147

Culpin, V., Eichenberg, T., Hayward, I., & Abraham P. (2014). Learning, intention to transfer and transfer in executive education. *International Journal of Training and Development*, *18*(2), 132-147. doi:10.1111/ijtd.12033

Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approach*. Los Angeles, CA: Sage Publications.

Creswell, J. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Boston: Education.

Daffron, S., & North, M. (2011). *Successful transfer of learning*. Malabar, FL: Krieger Publishing Company.

Dean, P., & Ripley, D. (1997). *Performance improvement pathfinders: Models for organizational learning systems.* Washington, DC: International Society for Performance Improvement.

De Feijter, J., De Grave, W., Hopmans, E., Koopmans, R., & Scherpbier, A. (2012). Reflective learning in a patient safety course for final-year medical students. *Medical Teacher*, *34*(11), 946–954. doi:10.3109/0142159X.2012.714873

DeFeo, J., & Caparas, F. (2014). Tutoring as transformative work: A phenomenological case study of tutors' experiences. *Journal of College Reading and Learning*, *44*(2), 141-163. doi: 10.1080/10790195.2014.906272

Denham, C. (2007). The new patient safety officer: A lifeline for patients, a life jacket for CEOs. *Journal of Patient Safety, 3*(1), 43-54. Retrieved from doi:10.1097/PTS.0b013e318036bae9

Dickey, N., Corrigan, J., & Denham, C. (2010). Ten-year retrospective review. *Journal of Patient Safety, 6*(1), 1-4. doi:10.1097/PTS.0b013e3181d321ca

Department of Defense. (2014). *A competency model for patient safety managers*. Retrieved from https://health.mil/~/.../PatientSafety/PSM_Competency_ Model_062614_FINAL.ashx

Eckman, M., & Frey, D. (2005). Using the WebCT NAFTA program to promote analytical thinking and global awareness competencies through a team approach. *Clothing and Textile Research Journal*, *23*(4), 278-289. Retrieved from http://intl-ctr.sagepub.com

Egan, R. (2012). Understanding the effects of different study methods on retention of information and transfer of learning. *Electronic Journal of Research in Educational Psychology*, *10*(2), 659-672. Retrieved from Investigation-psicopedagogica.org/revista/new/English/contadorArticulo.php?692

Elghouche, A. (2015). A medical student's perspective on interprofessional collaboration. *Patient Safety and Quality Healthcare*, *12*(5), 56-59. Retrieved from www.psqh.com/.../a-medical-student-s-perspective-on-interprofessional-collaboration/

Fatima, A. (2011). *How has root-cause analysis evolved since inception?* Retrieved from www.brighthubpm.com/risk-management/123244.-how-has-the-root-cause-analysis-evolved-since-inception

Fillipo, B., & Barnhill, S. (2010). Improve reliability in healthcare with human factors engineering. *Patient Safety and Quality Healthcare*, *7*(2), 14-17. Retrieved from https://www.psqh.com/analysis/improve-reliability-in-healthcare-with-human-factors-engineering/

Fisher, D., & Frey, N. (2016). Transfer goals for deeper learning. *Educational Leadership*, *73*(6), 80-81. Retrieved from

http://www.ascd.org/publications/educational-leadership/mar16/vol73/num06/Transfer-Goals-for-Deeper-Learning.aspx

Foley, J., & Kaiser, L. (2013). Learning transfer and its intentionality in adult and continuing education. *New Directions for Adult and Continuing Education*, *2013*(137), 5-15. doi:10. 1002/ace.20040

Furman, N., & Sibthorp, J. (2013). Leveraging experiential learning techniques for transfer. *New Directions for Adult and Continuing Education, 137,* 17-26. doi:10.1002/ace/20041

Foronda, C. (2016). Spanning boundaries with virtual simulation to teach interprofessional communication. *Medical Simulation*, *5*(1), 6-10. Retrieved from http://www.bluetoad.com/publication/index

Fox, R. (1984). Fostering transfer of learning to work environments. *New Directions for Adult and Continuing Education*, *1984*(22), 25-38. doi:10.1002/ace.36719842205

Galbraith, M. W. (2004). *Adult learning methods: A guide for effective instruction*. (3rd ed.). Malabar, FL: Krieger Publishing Company.

Gilley, J., Shelton, P., & Gilley, A. (2011). Developmental leadership: A new perspective for human resource development. *Advances in Developing Human Resources*, *13*(3), 386-405. doi:10.1177/1523422311424264

Gilpin, A. (1993). Table for conversion of Kendall's's Tau to Spearman's Rho within the context measures of magnitude of effect for meta-analysis. *Educational and Psychological Measurement*, *53*(1), 87-92. doi: 10.1177/0013164493053001007

Ginsburg, L., Chuang, Y., Berta, W., Norton, P., Ng, P., Tregunno, D., & Richardson, J. (2010). Organizations, market, and performance: The relationship between organizational leadership for safety and learning from patient safety events. *Health Services Research*, *45*(3), 607-632. doi:10.1111/j.1475-6773.2010.01102.x

Gitonga, J. (2007). *Transfer of learning in continuing medical education (CME): A conceptual model*. Online Submission Paper presented at the International Research Conference in the Americas of the Academy of Human Resource Development, Indianapolis, IN. Retrieved from http://*www.eric.ed.gov/ERICWebPortal/recordDetail?accno=ED504737/*

Glesne, C. (2011). *Becoming qualitative researchers*. Boston, MA: Education, Inc.

Goldstone, R., & Day, S. (2012). Introduction to "new conceptualizations of transfer of learning." *Educational Psychologist*, *47*(3), 149–152. doi:10.1080/00461520.2012.695710

Gordon, M. (2013). Nontechnical skills training to enhance patient safety. *The Clinical Teacher*, *10*(3), 170-175. doi:10.1111/j.1743-498X.2012.00640.x

Green, H. (2012). Transfer of learning and its ascendancy in higher education: A cultural critique. *Teaching in Higher Education*, *18*(4), 365-376. doi:10.1080/13562517.2012.719155

Grohmann, A., & Kauffeld, S. (2013). Evaluating training programs: development and correlates of the questionnaire for professional training evaluation. *International Journal of Training and Development*, *17*(2), 135-155. doi:10.1111/ijtd.12005

Gutman, L., & Schoon, I. (2013). The impact of noncognitive skills on outcomes for young people: Literature review. *Institute of Education London*, 1-57. Retrieved from https://v1.educationendowmentfoundationlorg.uk/uploads/pdf/Non-cognitive_skills_Exec_summary.pdf

Hagemeier, N., Hess, R., Hagen, K., & Sorah, E. (2014). Impact of an interprofessional communication course on nursing, medical, and pharmacy students' communication skill self-efficacy beliefs. *American Journal of Pharmaceutical Education*, *78*(10), 1-10. doi:10.5688/ajpe7810186

Hall, G., Smith, M., & Dare, C. (2014). The learning transfer big picture. *International Society for Performance Improvement, 53*(10), 6-11. doi:10.1002/pfi.21442

Hancock, D., & Algozzine, B. (2011). *Doing case study research*. New York, NY: Teachers College Press.

Health and Human Services, Centers for Disease Control and Prevention. (2009). *Justification of efforts for appropriation committees*. Retrieved from http://www.cdc.gov/fmo/topic/budget%20information/appropriations_budget_form_pdf/fy09_cdc_cj_final.pdf

Healthcare Government. (2012). *Partnership for patients*: *Better care*, *lower costs*. Retrieved from http://www.heathcare.gov/news/factsheet/2011/04/partnership04122011a.html

Heller, J. (2004). *Catch-22*. New York: Simon & Schuster Paperbacks.

Henry, S., Holmboe, E., & Frankel, R. (2013). Evidence-based competencies for improving communication skills in graduate medical education: A review with

suggestions for implementation. *Medical Teacher*, *35*(5), 395-403. doi: 10.3109/0142159X.2013.769677

Heron M. (2016). Deaths: Leading causes for 2013. *National Vital Statistics Reports*, *65*(2), 1-94. Retrieved from www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_02.pdf

Holdsworth, M., Bond, R., Parikh, S., Yacop, B., & Kristina, M., & Wittstrom, K. (2015). Root cause analysis design and its application to pharmacy education. *American Journal of Pharmaceutical Education*, *79*(7), 1-7. doi:10.5688/ajpe79799

Hoyt, B. (2013). Predicting training transfer of new computer software skills: A research study comparing e-learning and in-class delivery. *Association for University Regional Campuses of Ohio Journal, 19,* 83-111. Retrieved from www.aurco.org/Journals/ AURCO_Journal_2013/Predicting_Training_Transfer_AURCO_Vol19_2013.pdf

Holton, E., Wilson, L., & Bates, R. (2009). Toward development of a generalized instrument to measure andragogy. *Human Resource Development Quarterly*, *20*(2), 169-193. doi:10.1002/hrdq.20014

Hubbard, I., Parsons, M., Neilson, C., & Carey, L. (2009). Task specific training: Evidence and translation to clinical practice. *Occupational Therapy International*, *16:*3-4, 175-189. doi:10.1002/oti.275

Hunter, D., & Nielsen, S. (2013). Performance management and evaluation: Exploring complementarities. *New Directions for Evaluation*, (137), 7-17. doi:10.1002/ev.20042

Hyman, W., & Latino, R. (2014). Root cause analysis: Useful activity or busy work. *Patient Safety and Quality Healthcare*, *11*(6), 12. Retrieved from https://www.psqh.com/analysis/useful-activity-or-busy-work

Illeris, K. (2007). What we do actually mean by experiential learning? *Human Resource Development Review*, *6*(1), 84-95. doi: 10.1177/1534484306296828

Institute for Healthcare Improvement. (2011). *CMS partnership for patients.* Retrieved from http://IHI.org/explore/CMSpartnershipforpatients/pges/default.aspx

Institute for Healthcare Improvement. (2013). *Patient safety executive development program*. Retrieved from http://www.ihi.org/ offerings/Training/PatientSafetyExecutive/2013 patientsafetyexecutivedevelopment/Pages/default.aspx.

Institute for Healthcare Improvement. (2013). *Patient safety executive development program*. Retrieved from http://www.psqh.com/analysis/the-dirty-dozen-persistent-safety-gaffes-we need-to-resolve

Institute of Medicine (IOM) 1999 Report. (2000). *To err is human: Building a safer health system*. Washington, DC: National Academies Press.

Institute of Medicine (IOM). 2012 Report. (2012). *Best care at lower cost: The path to continuously learning health care in America*. Washington, DC: National Academies Press. Retrieved from Institute for Safe Medication Practices. (2014). The dirty dozen: Persistent safety gaffes we need to resolve. *11*(6), 26-29.

Interprofessional Education Collaborative Expert Panel. (2011). *Core competencies for interprofessional collaborative practices: Report of an expert panel.* Retrieved from http://www.aacn.nche.edu/education-resources/ipecreport.pdf

James, J. (2013). A new, evidenced-based estimate of patient harms associated with hospital care. *Journal of Patient Safety*, *9*(3), 122-128. doi:10.1097/PTS.0b013e3182948a69

Jha, V., Winterbottom, A., Symons, J., Thompson, Z., Quinton, N., Corrado, O., Melville, C., Watt, I., Torgerson, D., & Wright, J. (2013). Patient-led training on patient safety: A pilot study to test the feasibility and acceptability of an educational intervention. *The Medical Teacher*, *35*(9), 1464–1471. doi:10.3109/0142159X.2013.778391

Jones, A., & Pasciak, A. (2015). Improving safety and reducing harm from fluoroscopy. *Patient Safety and Quality Healthcare*, *12*(4), 33-37. Retrieved from http://www.psqh.com/ analysis/a-model-for-simulation-based-interprofessional-team-learning

Karlsson, P., Eriksson, B., & Leissner, T. (2008). Evaluation workshops for capacity building in welfare work. *Evaluation, 14*(4*),* 483-498. doi:10.1177/1356389008095489

Kemerer, R. (1991). *Understanding the application of learning*: *Mistakes made and lessons learned*: *Overcoming obstacles to successful program planning*. San Francisco, CA: Jossey-Bass.

Khanna, L. (2008). *The patient safety officer's handbook*. Marblehead, MA: HCPro.

Kirkpatrick. D. (1996). *Evaluating training programs: The four levels.* San Francisco, CA: Berrett-Koehler.

Kirkpatrick, J., & Kirkpatrick, W. (2010). *Training on trial: How workplace learning must reinvent itself to remain relevant.* New York, New York: AMACOM.

Knowles, M. (1984). *Andragogy in action*. San Francisco: Jossey-Bass.

Knowles, M., Holton, E., & Swanson, R. (2011). *The adult learner: The definitive classic in adult education and human resource development.* Amsterdam, NL: Butterworth-Heinemann.

Kohn, L., Corrigan, J., & Donaldson, M. (2000). *To err is human: Building a safer healthcare system.* Washington, DC: The National Academies Press. Retrieved from http://www.nap.edu/catalog.php?record_id=9728#toc

Koo, D., & Miner, K. (2010). Outcome-based workforce development and education in public health. *Annual Review Public Health*, *31,* 253-269. doi: 10.1146/annurev.publhealth.012809.103705

Lankshear, S., Kerr, M., Laschinger, H., & Wong, C. (2013). Professional practice leadership roles: The role of organizational power and personal influence in creating a professional practice environment for nurses. *Health Care Management Review*, *38*(4), 349-360. doi:10.1097/HMR.0b013e31826fd517

Larsen-Freeman, D. (2013). Transfer of learning transformed. *Learning Language Journal of Research in Language Studies*, *64*(1), 107-129. doi:10.1111/j.1467-9922.2012.00740.x

Leape, L. (2000). Institute of medicine medical error figures are not exaggerated. *Journal of the American Medical Association*, *284*, 95. doi:10.1001.jama.284.1.95

Leedy, P., & Ormrod, J. (2013). *Practical research planning and design.* Upper Saddle River, NJ: Pearson Education.

Leis, S. (2015). A quick guide to preparing professional presentations. *Management and Leadership*, *1*(11), 22-27. Retrieved from Nurse.com.

Leonard, M., Frankel, A., Federico, F., Frush, K., & Haraden, C. (2013). *The essentials guide for patient safety officers*. Oakbrook Terrace, IL: Joint Commission Resources & Institute for Healthcare Improvement.

Lodico, M., Spaulding, D., & Voegtle, K. (2010). *Methods in educational research: From theory to practice*. San Francisco, CA: Jossey Bass.

Luk, L., Ng, W., Ko, K., & Ung, V. (2008). Nursing management of nursing errors. *Nursing Ethics*, *15*(1), 28-39. doi: 10.1177/0969733007083932

Mallet, R., Conroy, M., Saslaw, L., & Moffatt-Bruce, S. (2012). Preventing wrong site, procedure, and patient events using a common cause analysis. *American Journal of Medical Quality*, *27*(1), 21-29. doi: 10.1177/1062860611412066

Mazur, L., & Chen, S. (2009). An empirical study for medication delivery improvement based on healthcare professionals' perceptions of medication delivery system. *Health Care Management Science, 12*(1), 56-66. doi:10.1007/s10729-008-9076-5

McGrath, V. (2009). Reviewing the evidence on how adult students learn: An examination of Knowles' model of andragogy. *Adult Learner 2009: The Irish*

Journal of Adult and Community Education, 99-110. Retrieved from http://www.anotas.com/pubsandlinks/ publications/the-adult-learner-2009

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide*. San Francisco, CA: Jossey-Bass.

Miller, L. (2014). Reflective practice for appraisal and revalidation in general practice: Towards new learning and improved patient safety? *Education for Primary Care, 25*(2), 119-121. Retrieved from https://www.researchgate.net/publication/260524009_Reflective_practice_for_appraisal_and_revalidation_in_general_practice_Towards_new_learning_and_improved_patient_safety

Moberg, E. (2006). *Pedagogy is for kids: Andragogy is for adults. Online submission report. 1-5.* Retrieved from http://eric.ed.gov/contentdelivery/servlet/ERICServlet? accno=ED507785

Moskowitz, J., & Nash, D. (2007). Accreditation council for graduate medical education competencies: Practice-based learning and systems-based practice. *American Journal of Medical Quality*, *22*(5), 351-382. doi:10.1177/1062860607305381

Myers, J., Tess, A., Glasheen, J., O'Malley, C., Baum, K., Fisher, E., O'Leary, K., Spencer, A., Warm, E., & Wiese, J. (2013). The quality and safety educator's academy: Fulfilling an unmet need for faculty development. *American Journal of Medical Quality*. Retrieved from http://ajm.sagepub.com/content/early/2013/04/10/ 1062860613484082

National Patient Safety Foundation. (2015). *RCA2: Improving root cause analyses and actions to prevent harm*. Retrieved from http://www.ashp.org/DocLibrary/BestPractices/NPSF-Root-Cause-Analyses.pdf

National Quality Forum. (2009). *Safe practices for better healthcare 2009 update: A consensus report*. Washington, DC: The National Quality Forum. Retrieved from http://www.qualityforum.org/Publications/2009/03/Safe_Practices_for_Better_Healthcare%E2%80%932009_Update.aspx

Newton, C., Wood, V., & Nasmith, L. (2012). Building capacity for interprofessional practice. *Clinical Teacher*, *9*(2), 94-98. doi:10.1111/j.1743-498X.2011.00510.x

Nichols, P., Copeland, T., Craib, I., Hopkins, P., & Bruce, D. (2008). Learning from error: Identifying contributory causes of medication errors in an Australian hospital. *Medical Journal of Australia*, *188*(5), 276-300. Retrieved from https://www.mja.com.au/journal/2008/188/5/learning-error-identifying-contributory-causes-medication-errors-australian

Noe, R. (2008). *Employee training and development*. New York, NY: McGraw Hill.

Noe, R., Sears, J., & Fullenkamp, A. (1990). Relapse training: Does it influence trainees' post training behavior and cognitive strategies? *Journal of Business and Psychology, 4*(3), 317-328. Retrieved from http://link.springer.com/article/10.1007/BF01125242#page-1

Ottoson, J. (1995). Reclaiming the concept of application: From social to technological process and back again. *Adult Education Quarterly*, *46*(1), 17-30. Retrieved from http://search. ebscohost.com.ezp.waldenulibrary.org

Ottoson, J. (1997). After the applause: Exploring multiple influences on application following an adult education program. *Adult Education Quarterly, 47*(2), 92-102. doi: 10.1177/074171369704700203

Ottow, C. (2015). Spotlight on soft skills: Sorting the true professionals for the snappy dressers [Web log post]. Retrieved from http://www. skillsurvey.com

Papa, A., & Rich, V. (2013). The role of nurse leaders in quality and patient safety. *Patient Safety and Quality Healthcare*, *10*(1), 18-19. Retrieved from https://www.psqh.com/analysis/the-role-of-nurse-leaders-in-quality-and-patient-safety

Paradies, M., & Unger, L. (2008). *Taproot*: *Changing the way the world solves problems.* Knoxville, TN: Systems Improvements.

Paranzino, J., Mork, P., & Veum, C. (2012). Turning data into information. *Sigma, 12*(1). 11-20. Retrieved from www.noblis.org/media/ccd9cae9-eb51-4b8a.../Sigma_Healthcare Transformation_pdf

Patient Safety Manager Job Description. (n.d.). In *Salary.com's* online job description post. Retrieved from swz.salary.com/salarywizard/patient-safety-manager-job-description.aspx

Patterson, B. (2015). A model for simulation based interprofessional team learning. *Patient Safety and Quality Healthcare*, *12*(4), 22-25. Retrieved from http://www.psqh.com/ analysis/a-model-for-simulation-based-interprofessional-team-learning

Pham, J., Natterson, J., Goeschel, C., & Provonost, P. (2010). Recasting the RCA: An improved model for performing root cause analyses. *American Journal of Medical Quality*, *25*(3), 186-191. doi: 10.1177/ 1062860609359533

Phillips, A., & Metcalfe-Smith, R. (2014). Using simulation to coordinate care for cardiac surgery. *Patient Safety and Quality Healthcare*, *11*(6), 30-36. Retrieved from www.psqh.com/analysis/using/simulation/to/coordinate/care/for/cardiac/surgery

Phillips, J., & Gully, S. (1997). Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal setting process. *Journal of Applied Psychology*, *82*(5), 792-802. doi: 10.1037/0021-9010.82.5.792

Pipas, C., Turco, M., Olson, C., Shoop, G., Tood, F., Simons, R., & Souba, W. (2016). Facilitating the development of healthcare leaders, simulation and the example of the Geisel school of medicine. *Medical Training Magazine*, *5*(2), 6-9. Retrieved from www.halldale.com/mtmagazine

Polancich, S., Roussel, L., & Patrician, P. (2014). Best practices for conducting an RCA: Are there any? *Patient Safety and Quality Healthcare*. Retrieved from http://www.psqh.com/analysis/best-practices-for-conducting-an-rca/

Pratt, D. D. (1993). Andragogy after twenty-five years. In Sharan Merriam (Ed.), *Adult learning theory: An update* (pp. 15-25). San Francisco, CA: Jossey-Bass.

Rachal, J. R. (2002). Andragogy's detectives: A critique of the present and a proposal for the future. *Adult Education Quarterly, 52*(3). doi:10.1177/0741713602052003004

Reason, J. (2003). *Human Error*. Cambridge, United Kingdom: Cambridge University Press.

Reznick, R. (2014). Lessons learned in the pursuit of a dream. *Medical Education, 48*(8)*,* 768-775. doi:10.1111/medu.12516

Roberson, L., Kulik, C., & Pepper, M. (2009). Individual and environmental factors influencing the use of transfer strategies after diversity training. *Group & Organization Management*, *34*(67). doi:10.1177/1059601108329732

Robertson, N. (2012). Improving patient safety: lessons from rock climbing. *The Clinical Teacher, 9*(1)*,* 41-44. doi:10.1111/j.1743-498X.2011.00485.x

Rose, N., Myerson, J., Roedinger, H., & Hale, S. (2010). Similarities and differences between working memory and long-term memory: Evidence from the levels-of-processing span task. *Journal of Experimental Psychology*, *36*(2), 471-483. doi:10.1037/a0018405

Rourke, L., & Boyington, C. (2015). A workshop to introduce residents to effective handovers. A workshop to introduce residents to effective handovers. *The Clinical Teacher, 12*(2)*,* 99-102. doi:10.1111/tct.12263

Rouse, M. (2010). *The Joint Commission, 2010*. Tech target. Retrieved from searchhealthlit. techtarget.com/definition/The-Joint-Commission

Rowthorn, V., & Olsen, J. (2014). All together now: Developing a team skills competency domain for global health education. *Journal of Law, Medicine & Ethics*, *42*(4), 550-563. doi:10.1111/jlme.12175

Saavedra, A., & Opfer, V. (2012). Learning 21st-century skills requires 21st-century teaching. *Kappan Magazine*, *94*(2), 8-13. Retrieved from http://www.rand.org/pubs/external_ publications/EP51080.html

Scaletta, T. (2016). Using automated surveillance to improve diagnosis. *Patient Safety and Quality Healthcare*, *13*(3), 45-47. Retrieved from www.psqh.com/analysis/using-automated-surveillance-to-improve-diagnosis

Scobie, A., & Persaud, D. (2010). Patient engagement in patient safety: Barriers and facilitators. *Patient Safety and Quality Healthcare*, *7*(2), 42-47. Retrieved from https://www.psqh.com/analysis/patient-engagement-in-patient-safety-barriers-and-facilitators

Sherwin, J. (2011). Contemporary topics in healthcare: Root cause analysis. *Physical Therapy in Motion*, *3*(4), 26-31. Retrieved from http://www.apta.org/PTinMotion/2011/5

Shur, R., & Simons, N. (2008). Quality issues in health care research and practice. *Nursing Economics, 26*(4), 258-262. Retrieved from http://www.nursingeconomics.net/cgi-bin/WebObjects/NECJournal.woa

Simon, M. (2010). *Dissertation and scholarly research: Recipes for success.* Cottage Grove, OR: Dissertation Success, LLC.

Smith, S., Henn, P., Gaffney, R., Hynes, H., McAdoo, J., & Bradley, C. (2012). A study of innovative patient safety education. *The Clinical Teacher, 9*(1), 37-40. doi:10.1111/j.1743-498X.2011.00484.x

Taylor, M. (1997). *Transfer of learning: Planning workplace education programs*. Canada: National Literary Secretarist. Retrieved from http://offline.library.copian.ca.item/369

Taylor, M. (2000). Transfer of learning in workplace literacy programs. *Adult Basic Education*, *10*(1), 3-21. Retrieved from https://eric.ed.gov/?id=EJ604480

Taylor, B., & Kroth, M. (2009). Andragogy's transition into the future: Meta-analysis of andragogy and its search or a measurable instrument. *Journal of Adult Education 38*(1), 1-11. Retrieved from http://www/eric.ed.gov/contentdelivery/servlet/ERICServlrt?accno=EJ891073

Thampy, H., & Danczak, A. (2015). GP training for patient safety: understanding, classifying and mapping. *Education for Primary Care*, *26*(5), 326–327. doi10.1080/14739879.2015.1082278

The Beryl Institute. (2012). *Teamwork*, *communication*, *safety culture*, *and the patient experience*: *What's the connection*? Retrieved from http://www.theberylinstitute.org

The International Hospital Federation. (2015). *Leadership competencies for healthcare service managers*. Retrieved from https://www.ihf-fih.org/resources/pdf/Leadership_Competencies_for_Healthcare_Services_Managers.pdf

The Joint Commission. (2015c). *2016 Hospital national patient safety goals.* Retrieved from http://www.jointcommission.org/assets/1/6/2016_NPSG_HAP_ER.pdf

The Joint Commission. (2013). *Sentinel event policy and procedures.* Retrieved from http://www.jointcommission.org/Sentinel_Event_Policy_and_Procedures

Thompson, D., Cowan, J., Holzmueller, C., Wu, A., Bass, E., & Provonost, P. (2008). Planning and implementing a systems-based patient safety curriculum in medical

education. *American Journal of Medical Quality*, *23*(4), 271-278. doi: 10.1177/1062860608317763

Tseng, K., Chang, C., Lou, S., Tan, Y., & Chiu, C. (2012). How concept-mapping perception navigates student knowledge, transfer performance. *Educational Technology & Society*, *15*(1), 102–115. Retrieved from www.ifets.info/journals/15_1/10.pdf

Vanderveen, T. (2014). Alarm management: first things first. *Patient Safety and Quality Healthcare*, *11*(6), 38-45. Retrieved from www.psqh.com/analysis/alarm-management-first-things-first

Varkey, P., Karlapudi, S., Rose, S., & Swensen, S. (2009). A patient safety curriculum for graduate medical education: results from a needs assessment of educators and patient safety experts. *American Journal of Medical Quality*, *24*, 214–221. doi:10.1177/1062860609332905

Varkey, P., Reller, M., Smith, A., Ponto, J., & Osborn, M. (2006). An experiential interdisciplinary quality improvement, education initiative. *American Journal of Medical Quality*, *21*(5), 317-322. doi: 10.1177/1062860606291136

Vella, J. (2010). *On teaching and learning*: *Putting the principles and practices of dialogue education into action.* San Francisco, CA: Jossey Bass.

Vyas, D., McCulloh, R., Dyer, C., Gregory, G., & Higbee, D. (2102). An interprofessional course using human patient simulation to teach patient safety and teamwork skills. *American Journal of Pharmaceutical Education*, *76*(4), 1-9. doi:10.5688/ajpe76471

Wachter, R. (2010). Patient safety at ten: Unmistakable progress, troubling gaps. *Health Affairs*, *29*(1), 165-173. doi:10.1377/hlthaff.2009.0785

Wakefield, J., & Jorm, C. (2009). Patient safety, a balanced measurement framework. *Australian Health Review*, *33*(3), 382-389. Retrieved from http://www.publish.csiro.au/AH/AH090382

Waruingi, M. (2010). *Dr. Mac! Dissertation mentoring handbook, Book 1, and strategies for quantitative research*. Minnetonka, MN: Global Healthcare Systems.

Weatherford, B., & Viveiros, J. (2014). Senior nursing students' perspectives on safety competencies: An end-of-program outcome evaluation. *Nursing Education Perspectives, 36*(3), 182-184. doi:10.5480/13-1182

Weick, K., & Sutcliffe, K. (2007). *Managing the unexpected*. San Francisco: Jossey-Bass.

Woods, M., & Pestotnik, S. (2015). A simplified sociotechnical model uncovers health IT safety risks. *Patient Safety and Quality Healthcare*, *12*(4), 18-20. Retrieved from http://www.psqh.com/analysis/health-it-safety-a-simplified-sociotechnical-model-uncovers-health-it-safety-risks

World Health Organization. (2011). *Patient Safety Curriculum Guide*. *Multi-professional edition*. Retrieved from http://apps.who.int/iris/bitstream/10665/44641/1/9789241501958_eng.pdf

Wu, A., Lipshutz, A., & Pronovost, P. (2008). Effectiveness and efficiency of root cause analysis in medicine. *JAMA, 299*(6), 685-687. doi:10.1001/jama.299.6.68

Yuniarto, H. (2012). The shortcomings of existing root cause analysis tools. *Proceedings of the World Congress on Engineering, 3*, 186-191. doi:10:1177/1062860609359533

Zhuy, H., Dasy, P., Wong, I., Du, X., Prosser, K., & Vyas, V. (2012). Student-led interprofessional workshop for patient safety and quality improvement. *Medical Teacher*, *34*(2)*,* 177-178. doi:10.3109/0142159X.2012.644837

Appendix A: The Project

Agenda (Instructional Plan) Conference Workshop

Competency Skills Building for RCA Investigations: Shading out the Barriers

Room Arrangement: Podium up front for the instructors and 15 round tables with 6 chairs facing podium

Instructional Resources and Equipment: Big screen projectors or TVs and computers, speakers, portable microphones; PowerPoint presentations; laser pointer; and note-taking materials, handouts, large adhesive poster paper; medium sized sticky notes in square, oval, and round shapes; pens, pencils, and markers

Day 1

7:30-8:00am
Registration: Conference Workshop Goodie Bag, Handouts, Agenda, and Evaluations

8:00–8:30
Introductions, Moderator/Instructor Welcome, and Administration:
Presentation: Briefly inform students that use of PowerPoint slides and video clips, subject matter experts' assistance, 50:10 speaker/Q&A minutes, polling, role-playing, demonstrations, and simulation will occur during the workshop

Administration: Fire Safety and Evacuation, Bathrooms, Illness, Lunch, Refreshments

8:30-9:00
Workshop Overview: RCA Investigations, Problem, Solution, Goals, and Evaluations

9:00-9:15 **- Break**

9:15-10:15
Patient Safety & Profiled RCA Investigations
Leadership Feedback, Problems, Interactive Polling

10:15-11:15
Quantitative RCA Investigation Research Study
The Good and Bad Findings and Implications:
Bad Explained: Lack of Time, Inter-professional Differences, Unwilling Colleagues

11:15-12:30 p. m. – **Lunch**

12:30-1:30
RCA Interference: Understanding Each Barrier

Active Learning- PSOs' Personal Stories
1:30-2:30
Solutions to Diffusing RCA Barriers,
Polling Q & A

2:30-2:45 **- Break**

2:45-3:45
Professional Development and Patient Safety Officers Competency Skills
Small group table discussions- Competencies for RCA investigations
Q&A

3:45-4:45
Goal: Performance Enhancing Competency Skills-Diffusing RCA Barriers
The Online Competency Skills Assessment Process Review

4:45-5:00
Day 1 Wrap-Up, Q&A, and Evaluations

Day 2

7:45-8:00 a.m.
Instructor Welcome, Day 1 Recap, Day 2 Overview, & Administrative Comments

8:00-9:00
Individual & Aggregate Analysis: Preconference Competency Skills Assessments
Matching Barrier to Competency, Polling Game

9:00-10:00
Competency Skill-Building Training
Barrier-Lack of Time-Turning a Lack of Time into Lots of Time
Competency Lecture: Resilience, Problem Solving, and Motivating Others
Video Clip Demo and Demo/Role Playing by PSOs and Instructors

10:00-10:15 **- Break**

10:15-11:15
Competency Skill-Building Training
Barrier-Interprofessional Differences- "Why Can't We All Get Along?" Part 1

Competency Lecture: Team Cohesiveness, Intrateam Communication, and Teamwork
Video Clip Demo and Demo/Role Playing by PSOs, Instructors, & Guest C-suite Leaders

11:15-12:15
Competency Skill-Building Training
Barrier-Interprofessional Differences- "Why Can't We All Get Along?" Part 2
Competency Lecture: Building Rapport, Trust, and Confronting Difficult Situations
Video Clip Demo and Demo/Role Playing by PSOs, Instructors, & guest C-Suite leaders

12:15-12:30pm - **Lunch**

12:30-1:30
Competency Skill-Building Training
Barrier-Interprofessional Differences: "Why Can't We All Get Along?" Part 3
Competency Lecture: Setting Performance Goals, Rewarding Improvement
Demo/Role Playing by Instructors, PSOs list reward ideas on flip chart board

1:30-2:30
Competency Skill-Building Training
Barrier-Unwilling Colleagues: Finding Engagement and Commitment, Part 1
Competency Lecture: Setting Performance Goals, Rewarding Improvement, and Listening for Understanding
Video Clip Demo, Communication Game, and Demo/Role Playing by Instructors

2:30-2:45 **- Break**

2:45-3:45
Competency Skill-Building Training
Barrier-Unwilling Colleagues: Finding Engagement & Commitment, Part 2
Competency Lecture: Working with Personal Issues and Organizational Knowledge
Demo/Role Playing by Instructors and PSOs

3:45-4:45
Goal: Performance Enhancing Competency Skills-Diffusing RCA Barriers
PSOs' Pre-Workshop Competency Skills Assessment Review
Compare Competency Scores to RCA Required Competencies
Video Tutorial on Assessment, Q&A

4:45-5:00
Day 2 Wrap-Up, Reminder to PSOs that they will actively participate in simulated RCA investigation tomorrow, Q&A, and Evaluations

Day 3

7:45-8:00am
Instructor Welcome, Day 1 & 2 Recap, Day 3 Overview, Administrative Comments

8:00-9:00
Competency Skills and RCA Barriers Review
Putting It All Together: Competency Skills Builds up RCA Investigation Outcomes
PSOs' Matching Competency Skill to Definition Jeopardy Game
Polling Game- PSOs select which competency skill is an antagonist to which Barriers

9:00-10:00
Introduction to RCA Investigation Low-Fidelity/Simulated Training
Review of RCA investigation process and steps
Q&A, Video Clip Demonstration of RCA Steps

10:00-10:15 **- Break**

10:15-11:15
Introduction to RCA Investigation Low-Fidelity/Simulated Training
Assignment of patient safety event to each RCA investigation team, PSO role selections, Overview business rules for simulated RCA investigation
Q&A

11:15-12:15
RCA Investigation Process and Low-Fidelity/Simulated Training, Part 1
Review of RCA process and steps. Start simulated RCA event investigation steps
Instructor's prompts and role playing to ensure barriers and competencies addressed, Q&A

12:15-12:30pm - **Lunch**

12:30-1:30
RCA Investigation Process and Low-Fidelity/Simulated Training, Part 2
Review of RCA process and steps. Continue RCA investigation steps to halfway point
Instructor's prompts and role playing to ensure barriers and competencies addressed, Q&A

1:30-2:30
RCA Investigation Process and Low-Fidelity/Simulated Training, Part 3
Review of RCA process and steps, Continue RCA investigation steps to completion
Instructor's prompts & role playing to ensure barriers and competencies addressed, Q&A

2:30-2:45 **- Break**

2:45-3:45
RCA Investigation Process and Low-Fidelity/Simulated Training, Part 1
RCA Team presentations of RCA outcomes, Barrier Feedback, Competency Use/Effect PSO feedback comments, Instructor Comments, Q&A

3:45-4:45
RCA Investigation Process and Low-Fidelity/Simulated Training, Part 2
RCA Team presentations of RCA outcomes, Barrier Feedback, Competency Use/Effect PSO feedback comments, Instructor Comments, Q&A
4:45-5:00
Day 3 Wrap-Up and Evaluation, Q&A, and Overall Workshop Evaluation
Conference Workshop Adjourns

Formative Evaluation for Daily Conference Workshop Sessions

Competency Skills Building for RCA Investigations: Shading out the Barriers

Day 1

Instructions: Please rate your reaction as 1, 2, or 3 to the workshop sessions held today; check the box that corresponds to your reaction for each statement:

Reaction Scale: (1= No 2= Somewhat 3= Yes)

	1= No	2= Somewhat	3= Yes
1. Did the instructor cover the objectives?			
2. Did the instructor present the information well?			
3. Did use of the video clips, polling questions, discussions, role playing, and demonstrations, and Q&A; help you learn about RCA investigation barriers and RCA competency skills?			
4. Were the techniques helpful in enabling you to consider how you would apply the new knowledge?			
5. Did the overall sessions contribute to your knowledge base?			

Please use the space below to write any additional comments or observations about today's workshop.

Formative Evaluation for Daily Conference Workshop Sessions

Competency Skills Building for RCA Investigations: Shading Out the Barriers

Day 2

Instructions: Please rate your reaction as 1, 2 or 3 to the workshop sessions held today; check the box that corresponds to your reaction for each statement:

Reaction Scale: (1= No 2= Somewhat 3= Yes)

	1= No	2= Somewhat	3= Yes
1. Did the instructor cover the objectives?			
2. Did the instructor present the information well?			
3. Did use of the video clips, active participation, the games, competency assessment review/implications, and Q&A; help you learn more about RCA competency skills use against barriers?			
4. Were the techniques helpful in enabling you to consider how you would apply the competency skills to improve your performance in facilitating investigations?			
5. Did the overall sessions contribute to your knowledge base?			

Please use the space below to write any additional comments or observations for today's workshop.

Formative Evaluation for Daily Conference Workshop Sessions

Competency Skills Building for RCA Investigations: Shading Out the Barriers

Day 3

Instructions: Please rate your reaction as 1, 2 or 3 to the workshop sessions held today; check the box that corresponds to your reaction for each statement:

Reaction Scale: (1= No 2= Somewhat 3= Yes)

	1= No	2= Somewhat	3= Yes
1. Did the instructor cover the objectives?			
2. Did the instructor present the information well?			
3. Was it clear what knowledge and skills were to be applied during the simulated team RCA investigation process?			
4. Were the techniques helpful in enabling you to consider how you would apply the competencies to the barriers that occurred during the investigation?			
5. Did the overall sessions contribute to your knowledge base?			

Please use the space below to write any additional comments or observations about today's workshop.

Summative Evaluation for the Conference Workshop

Competency Skills Building for RCA Investigations: Shading Out the Barriers
End of Workshop on Day 3

Instructions: Please rate your reaction as 1, 2 or 3 to the workshop sessions held today; check the box that corresponds to your reaction for each statement:

Reaction Scale: (1= No 2= Somewhat 3= Yes)

	1= No	2= Somewhat	3= Yes
1. Was the 3-day workshop agenda adequate in allowing breaks, meals, and networking?			
2. Were the conference workshop and lodging facilities adequate in stimulating your learning?			
3. Was it clear what knowledge and skills were to be applied during the simulated team RCA investigation process?			
4. Did the overall workshop increase your confidence in effectively using competencies to negate barriers during RCA investigations?			
5. Did the overall workshop increase your confidence in facilitating future RCA investigations?			

Please use the space below to write any additional comments or observations about today's workshop.

Conference Workshop: Competency Skills Building for RCA Investigations:

Shading Out the Barriers

Cynthia R. Lightner
Instructor/ Moderator
Certified Professional in Patient Safety

Conference Workshop Goals

- Develop competencies and demonstrate use of the competency skills for RCA investigations.
- Through simulation exercises, learn mitigation of the barriers.
- Improve quality of RCA outcomes at the local level due to PSOs ability to facilitate the team.

Conference Workshop Outcomes

The PSOs will be able:

- To specify the barriers that PSOs encounter when facilitating and conducting stakeholder required RCA investigations;
- To verbalize taught PSO competency skills, definition, and associated behaviors;
- To translate how effective use of competency skills results in higher functioning, team cohesiveness, and communicative efforts as a means to counter the barriers;
- To simulate an RCA investigation process using appropriate competency skills as behaviors to reduce effect or eliminate encountered barriers;
- To endorse confidence in being able to successfully improve RCA investigation performance outcomes

Background

- PSOs are responsible for work systems and processes that contribute to safe patient care, with various risk reduction plans (Khanna, 2008).

- Root Cause Analysis (RCA) Investigation is systematic and delves into process/systems that have caused patient harm; RCA prevents/reduces future harm risk (Sherwin, 2011).

- At the local level, PSOs' ability to apply knowledge and skills post RCA training to investigations is subpar, informal verbal feedback.

- Analysis is insufficient to fix identified root causes or risk factors; stakeholders' investment in cost of RCAs is now a concern.

Problem Statement

- Hook: There is a lack of safe, error free patient care; near 100K deaths from healthcare worker errors occur per year (Leape, 2000).

- Anchor: To reverse, PSOs conduct RCA investigations to find and develop strong fixes for broken processes and systems.

- General Education Problem: Consider why RCA PD training is not resulting in expected harm reducing investigation outcomes.

- Specific Education Problem: Post-training, post-investigation RCA follow-up assessment is lacking but needs exploring to discover barriers that exist in conducting a RCA.

Purpose Statement

- This quantitative survey study is to assess PSOs' reports concerning RCA training and investigation experiences, benefits, attitudes, barriers, and time since training.

- Determine if a correlation exists between the time since RCA training and the number of barriers encountered during investigations.

Research Questions

- What do PSOs report as their training and investigation experiences, benefits, attitudes, barriers, and time since training toward improved patient safety in healthcare settings, after preservice RCA, training and RCA conducted investigations?

- What relationship exists between the amount of time since PSOs had RCA training and the reported frequency of barriers encountered in conducting a RCA?

Method/Design Chosen to Help Add New Insights

The study was a **quantitative survey.**
Anonymous platform necessary to avoid influencing the responses online.

Descriptive: Allows **exploration** for the specific issues related to **training** and subpar RCA **investigation** outcomes in a situation *as is,* without controlling the variables

Correlation: Determine the **relationship** between the amount of **time since** PSOs had RCA **training** and the reported **frequency of barriers** encountered in conducting an **investigation.**

Pre-established survey used to collect the data; describe PSOs experiences, attitudes, barriers, and time since training.

Data analysis determined time since training is NOT **associated** with frequency of RCA barriers.

Barriers Encountered with RCAs

- Lack of Time -#1
- Inter-professional Differences - #2
- Unwilling Colleagues- #3
- Interference from Internal/External Sources
- Unsupportive Management
- Difficulty with RCA Teams
- Lack of Feedback and Data
- Lack of Resources

Summary of Research-Good and No So

- Wide range of time since RCA training occurred
- RCA training was on target; well prepared perception after conducting an actual RCA
- Most had facilitated a RCA; 20% had not
- Little to no opportunity to practice RCA investigation process as a nonfacilitator/nonleader of the investigation

Summary of Research- Good and No So

- Their PSOs experience level nor number of RCAs facilitated prevented the PSOs from experiencing all the barriers

- Proven with inferential statistics- correlation between time since RCA training, number of RCAs facilitated, and frequency of barriers

- Practice was not making perfect and training was not inadequate for what it was intended to do

Summary of Research- Good and No So

- Top three barriers were lack of time, inter-professional differences, and unwilling colleagues; these are work site (organizational) issues. Training and ability to perform a RCA after training was successful as far as the methodology was concerned

- Focus on the barriers is the key…training or training aids, policy changes are not going improve performance with RCA facilitation or corrective actions if the barriers are not removed or handled

Summary of Research- Good and No So

- Overall, RCAs are positively favored, are value added, do reduce patient harm, the corrective actions are implemented and therefore are not seen as a waste of time.

- The barriers are significantly interfering with RCA investigation facilitator effort and correct action. Fix that and the quality of the RCA investigation should approve.

- PSO's solution to the barriers???

Patient Safety Officer Competency Model

- Nontechnical:
- Communication (oral and written)
- Commitment to Resilience
- Teamwork
- Decision Making
- Coalition Building
- Interpersonal Skills

End-of-Day 1 Closing Comments

- Review objectives
- Review today's highlights
- Seek feedback from PSOs
- Q&A
- Conduct evaluation; place in designated bin in room

Patient Safety Officer Competency Model

- Nontechnical:
- Communication (Oral and Written)
- Commitment to Resilience
- Teamwork
- Decision Making
- Coalition Building
- Interpersonal Skills
- Educating Others

End of Day 2 Closing Comments

- Review objectives
- Review today's highlights
- Seek feedback from PSOs
- Q&A
- Conduct evaluation; place in designated bin in room

Simulation-RCA Event for Investigation

- Introduce the volunteer PSOs helping as instructors for RCA
- RCA process for investigation short review
- Provide job aids at each table
- Rules of engagement:
    - Small teams
    - 100% participation
    - Use competencies
    - Be prepared to summarize investigation
- Role playing for barrier issues & competency development

End of Day Closing Comments

- Review objectives
- Review highlights from the day
- Seek feedback from PSOs
- Q&A
- Conduct evaluation and leave in designated bin in room

Active Engagement/Learning

- Communication
- Gaming
- Communication Game
- Polling app per cellphone
- Jeopardy

Competency eats Barriers for Lunch: Lack of Time

- Resilience
- Problem Solving
- Motivating Others

Competency Eats Barriers for Lunch: Interprofessional Differences

- Team Cohesiveness, Intra-team Communication, and Teamwork
- Building Rapport and Trust, and Confronting Difficult Situations
- Setting Performance Goals, Rewarding Improvement

Competency Eats Barriers for Lunch: Unwilling Colleagues

- Setting Performance Goals, Rewarding Improvement, and Listening for Understanding
- Working With Personal Issues and Organizational Knowledge

Potential Social Change

- Data-driven policy change or instructional strategies for RCA training and investigation
- Improve RCA training/learning transfer
- Improve RCA investigation process
- Elevate the strength of RCA outcomes

End-of-Day 3 Closing Comments

- Review objectives
- Review today's highlights
- Seek feedback from PSOs
- Q&A
- Conduct evaluation; place in designated bin in room

Competency Instructional Guide at Professional Development Workshop

Instructor/Moderator- Cynthia Lightner, Guest Instructors

Day 1

Slide 1-

Conference Workshop Title Slide

Slide 2

Self-explanatory. Explain the reason why these goals were developed and discussed as RCA problems. Explain that in order for RCA investigations to improve, the facilitation of the RCA has to improve. For that to happen interventions to enhance leadership of investigations and barriers related to the investigation have to be addressed. Elimination of barriers is key. A conference workshop goals support prepares the PSOs as better facilitators of evidence based barriers.

Slide 3

Self-explanatory. Defines specific measurable means on intent of workshop and existing RCA perception status. Is your worksite in a productive steady state or in chaos? Five PSOs demonstrate or play the communication game. Use slide 16 here prior to introduce PSO activity to show how chaos can occur with team whether RCA investigation or another task.

Slide 4

RCA considered the norm for healthcare investigations

Use of whys process to determine causal factors, root causes and corrective actions to mitigate future harm.

Time consuming and personnel intensive process; lead by PSOs.

Slide 5

The PSO need a perspective on research study that identified the barriers and other descriptive findings from the study.

Specific Problem statement:

There has been no post-training, post-investigation follow-up assessment to determine how PSOs report their training experiences after they start performing their role as RCA investigators.

General Education Problem: Consider why RCA PD training is not resulting in expected harm-reducing investigation outcomes.

Specific Education Problem: Post training, post investigation RCA follow-up assessment is lacking but needs exploring. Identification of barriers that exist in conducting a RCA.

Slide 6

The educational impact of this issue is to develop recommendations that will improve RCA training and investigation outcomes.

The social impact of this issue is local; recommend standardized RCA training/process changes that will serve to improve RCA outcomes and reduce patient harm rates.

Slide 7

Explain that study is set-up to discover PSOs perception. PSO's are best to judge RCA experiences for they are facilitators and conductors of investigations. Asking these questions provides findings and implications at the practice level.

Slide 8

-The study is a quantitative online survey

-The type of methods used is descriptive and correlation

-This design will use a pre-established survey given online; data integrity to avoid response influences negatively or positively. Supervisor of participants that will be invited to participate in the study

-Design allows analysis of the data to determine if a correlation exists and to determine relationship to barrier and frequency of barriers. Guides the project study component/plans for recommended changes/modified strategies in training or investigation practices; determines the project study.

Transition to the next slide, "What barriers would you say are the top three that you have encountered. Briefly allow the selectees to describe their experiences with barrier.

Slide 9

Inform PSOs to refer to handouts on quantitative research study, data analysis, and graphs for each barrier.

Transition to a Polling activity with active PSO engagement: Ask group for their definition of a barrier. Put up slide 16 on screen as visual indicator that interactive

activity is beginning. Ask question as a jeopardy answer. An explanation on what each barrier means will be given. Help PSO understand that barriers are simple problems or roadblock toward best team work and cohesiveness during the RCA investigation process.

Slide 10

Solution to the barriers? Ask for PSO participation, encourage their feedback for qualitative insight on why they gave these answers if time permits. I will obtain feedback from one PSO.

Slide 11

Solution to the barriers? Ask for PSO participation, encourage their feedback for qualitative insight on why they gave these answers if time permits. I will obtain feedback from one PSO.

Slide 12

Solution to the barriers? Emphasize that I would like to know about their barrier experience. If no volunteer, I will call on the class. Ask for PSO participation, encourage their feedback for qualitative insight on why they gave these answers if time permits. I will obtain feedback from one PSO.

Slide 13

Explain overall competencies that CRL company identified that all PSO employees should have. Explain that the company is committed to professional development of skills, knowledge, and attitude on competencies. Ask them which

competency do they think align with the top 3 barriers with RCA investigation. They will explain why they gave answer they did.

Use online competency model video for all competencies; demonstrations are part of the videos, unless otherwise stated under the competency heading.

An Example:

The CRL Company developed a basic competency model but not specific to RCA investigation problems because the research study had not been accomplished. Inform PSOs that these are soft skill versus technical and that HR used the DOD model from which to build.

Obtain active learning from PSOs. Conduct polling questions. What is applicable to RCA from the list?

Mention Handout in Study package, pull out to reference - Definitions of Certain Competencies as shown below

-Communication (Oral and Written) –

Articulates or documents information in a concise manner to the receiver of the information through appropriate use of engaging communication methods such as bidirectional communication, humor, inflection, stories, nonverbal body gestures, analogies, active listening, excellent use of syntax, and sentence structure.

Instructor will demo this competency with PSO in attendance, after video explains the competency.

-Commitment to Resilience –

Consistent self behavior in the workplace that reflects objectivity, poise, composure and a positive attitude. Mastering disappointment, failures, and bouncing back from them rounds out a resilient mindset.

Demo of this competency per instructor and a guest instructor bought into the workshop; this is preplanned.

-Teamwork –

Interdisciplinary work with others to effectively give and receive mutual support to make decisions, problem solve, conduct work individually or in a group or team; utilizes effective communication, open-ended discussions, and listening skills to consider different perspectives; assists others in the appropriate use of the communication program, TeamSTEPPS tools.

-Decision Making –

Understands how to gather information, clarify issues, consider risks, benefits, and alternatives to a situation that is complex or has multiple concepts in order to make appropriate decisions with minimal or no supervisory input; categorizes reported patient safety or adverse events according to the DOD Patient Safety Harm scale (e.g., Near Miss, No Harm, Harm, etc.).

-Coalition Building –

Identifies information and facilitates an open flow of information exchange across the work sites; identifies requirements and engages parties essential to accomplishing mission goals and objectives; works with senior-level staff to champion patient safety

within the MTF; negotiates issues, with others who are resistant to change or do not stand to gain by negotiating; and gains buy-in and credibility by understanding the roles, responsibilities and motivations of others in the MTF.

-Interpersonal Skills –

Interacts, cooperates and works well with management, interdisciplinary teams, patients and general public under limited or no supervision; establishes rapport and exhibits respect for others to defuse hostile situations or elicit information (e.g., asking questions, finding common ground); listens to and interprets others' verbal and nonverbal communications; and courteously and tactfully delivers effective instruction (e.g., regulatory compliance, technical information, safety protocols).

-Educating Others –

Educates staff about the DoD PSP and the healthcare activities which increases patient safety event reporting of near miss, sentinel or adverse events, and to support program activities; contributes to the education of peers by sharing lessons learned and best practices via DoD PSP communities of practice; implements MTF-wide education programs to teach others about patient safety best practices and standards; and facilitates TeamSTEPPS training and implementation.

-Problem-solving:

Recognizes and defines problems, breaks issues into meaningful parts and designs effective solutions; uses critical thinking to generate and evaluate alternative solutions, makes recommendations and formulates action plans; and considers a broad range of internal and external factors when solving problems and making recommendations.

-Decision Making:

Makes sound, well-informed, timely and objective decisions based upon evidence-based best practices and reasoning; perceives the impact and implications of decision and indecision; determines whether an issue requires elevation to a more senior employee; makes effective decisions, even with limited information or when solutions result in unpleasant outcomes; and communicate decisions appropriately.

Slide 14

Prior to investigations, review this. Inform PSOs that they will conduct investigation as facilitator. Each of them will have opportunity to facilitate and participate in RCA. They will switch roles to ensure all PSO get opportunity to facilitate or be an actor who cause a barrier during the RCA. The instructor/moderator will give cues to the PSOs.

Take five minutes to do polling of highlights taught today. Three competencies questions: what is commitment to resilience, interpersonal skills, and team cohesiveness? Polling app will be available; the instructor/moderator will share information on access with PSOs.

Slide 15

End of day activities. Refer to this slide at end of work on day 1, 2, and 3- at time for evaluation.

Note: If any comments require follow-up and feedback that is unavailable at time of discussion, instructor will follow-up ASAP and no later than next day of the workshop.

End of Workshop Day 1.

Day 2

Slide 16

When time to interact, refer to slide as visual cue. Put this slide on screen immediately prior to polling activity at slide 9, 13, and 14.

Slide 17

The most frequently occurring RCA barrier is lack of time. This slide is about the competencies used to counter this barrier. Allow PSOs to critical think toward solutions; reference handout on definitions. Ask per polling which competencies may strengthen a PSOs ability to manage a lack of time with self or the RCA team members. Video demos for each competency will occur.

NOTE: Active learning as per agenda and instructional plan for next 4 slides.

Slide 18

Refers to Inter-professional Differences Barrier. Same plan as with slide 17.

Slide 19

The barrier is unwilling colleagues. Allow PSOs to challenge or comment on the alignment of competency to barrier. Affirm that flexibility is a part of critical thinking. Show videos. Same plan as with slide 117 and 18.

Slide 20

Goal at the worksite is to improve RCA investigations outcomes to reduce patient harm.

Slide 21

Refer to this slide Days 1, 2, and 3- at time for evaluation.

Refer back to slide 14 to go over RCA simulation training plan for next day.

Note: Any comments warranting follow-up and feedback will occur on the next day.

End of day Workshop Day 2.

Day 3

Slide 22

Start of day 3, prior to start of simulation activity, instructor/moderator will answer questions; engagement of PSOs in discussion on answer will also occur.

Put slide 14 on screen, showing RCA investigation simulation rules of engagement, and keep on screen until simulations completed. A half-day for simulation and a half-day for each team to go over their process, barriers, use of competencies, and so forth. After completion, slide 13 on screen for end of day activities and evaluations. The instructor/moderator will thank PSOs and remind them of the planned ongoing coaching calls.

End of Day 3: Workshop Completed

Appendix B: Bowie Survey

Root Cause Analysis: Training and Investigation Experiences, Benefits, and Attitudes

---

Thank you for agreeing to participate in this survey.

Please note the definition of the following terms:
Root Cause Analysis (RCA), for the purpose of this study, is used to cover all incident/patient safety/adverse event investigation processes (e.g. Taproot, Fish Diagram, 5 Why's, Lean, RCA etc.).
Facilitated a RCA- participated in the RCA process and led the team through the formalized RCA processes
Participated in a RCA- actively involvement in the RCA process as a team member.

Please indicate your level of agreement on the following RCA statements on the survey unless otherwise prompted immediately prior to the question or statement.

I. Training in Root Cause Analysis

1) How long ago did you attend RCA training?

- ☐ <6 months
- ☐ 7 - 11 months
- ☐ 12 - 24 months
- ☐ 25 - 36 months
- ☐ > 37 months

2) What type of training did you receive?

- ☐ eLearning
- ☐ Formal Classroom
- ☐ In-house training
- ☐ Nonwork sponsored external source

3) How many days did the RCA training involve?

- ☐ 0.5
- ☐ 1
- ☐ 1.5
- ☐ 2
- ☐ 2.5
- ☐ 3
- ☐ >3

4). Have you been able to apply the knowledge learned from your RCA training to your workplace?

- ☐ Definitely
- ☐ Partly
- ☐ Unsure
- ☐ Slightly
- ☐ Not at all

5). Have your work practices regarding safety and reporting errors changed since you attended the RCA training?

- ☐ Definitely
- ☐ Partly
- ☐ Unsure
- ☐ Slightly
- ☐ Not at all

6). Do you have a sufficient understanding/confidence by the end of the training to what was required to conduct a RCA?

- ☐ Definitely

- ☐ Partly
- ☐ Unsure
- ☐ Slightly
- ☐ Not at all

II. Experience of RCA Investigations

7). How many RCA investigations have you personally facilitated since training?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ More than 5

8). At what level was the RCA being conducted (check all that apply)?

- ☐ Local Work site
- ☐ Operational
- ☐ Divisional
- ☐ Corporate /Headquarters /Agency

9). On how many occasions have you been a participant of, but NOT facilitated, a RCA investigation team?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4

- ☐ 5
- ☐ More than 5

10). In general, did the RCA training provide you with the skills to participate in or facilitate a RCA?

- ☐ Definitely
- ☐ Partly
- ☐ Unsure
- ☐ Occasionally
- ☐ Never

If you have facilitated or participated in at least one RCA since attending the training course please continue answering the questions below, if NOT, go directly to question number fourteen (14).

11). When you participated in or facilitated a RCA(s) to what extent did you encounter the following barriers:

	Always	Sometimes	Unsure	Occasionally	Never
Unwilling Colleagues	☐	☐	☐	☐	☐
Unsupportive Management	☐	☐	☐	☐	☐
Lack of Resources	☐	☐	☐	☐	☐
Lack of time	☐	☐	☐	☐	☐
Interference from internal/external sources	☐	☐	☐	☐	☐
Difficulty with RCA teams	☐	☐	☐	☐	☐
Lack of feedback and data	☐	☐	☐	☐	☐
Inter-professional differences	☐	☐	☐	☐	☐

12). Positive aspects resulted from the RCA that you participated in or facilitated.

- ☐ Definitely
- ☐ Partly

☐ Unsure

☐ Occasionally

☐ Never

13). Generally speaking, of the RCA(s) in which you were involved, were the recommendations or corrective actions implemented:

☐ Fully

☐ Partly

☐ Unsure

☐ Never

14). Do you think a follow-up training session (after you have actually participated in or facilitated a RCA) would be beneficial?

☐ Yes ☐ No ☐ Unsure

15) Do you think receiving developmental and confidential feedback on a final draft of your RCA report(s) from colleagues trained in this process would be beneficial as part of your learning?

☐ Yes ☐ No ☐ Unsure

16) If you have not undertaken a RCA was it for the following reasons:

☐ No opportunity ☐ Lack of support ☐ Training Inadequate ☐ Lack of confidence

☐ Nonapplicable, I have been involved in a RCA

III. Your Attitudes to RCA

17) Undertaking a RCA is a time-consuming business. Is it good use of staff time and resources?

☐ Strongly Agree ☐ Agree ☐ Unsure ☐ Disagree ☐ Strongly Disagree

18) RCA's team members should include staff with a clinical background only and should NOT include staff outside of involved area(s)

☐ Strongly Agree ☐ Agree ☐ Unsure ☐ Disagree ☐ Strongly Disagree

19) Patients and relatives should be part of the RCA team

☐ Strongly Agree ☐ Agree ☐ Unsure ☐ Disagree ☐ Strongly Disagree

RCAs are conducted to improve work processes, improve patient safety, help the staff work together in teams, improve communication about patient care, and improve patient outcomes, and improve the standing of your profession. Please answer the following questions, #20-24, about RCA training:

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
20. Since undertaking Root Cause Analysis training (RCA) do you think that you are better trained in methods of dealing with incidents	☐	☐	☐	☐	☐
21. Since undertaking the RCA training, do you think you can improve work processes for the provision of safe patient care?	☐	☐	☐	☐	☐
22. Over the long term, do you think RCA training will contribute to the advancement of safety in healthcare?	☐	☐	☐	☐	☐
23. Considering the health systems investment in RCA training, are the benefits you see worth the investment?	☐	☐	☐	☐	☐
24. In general, did the training provide you with the skills to be involved in or facilitate a RCA?	☐	☐	☐	☐	☐

IV. About you (Demographics)

25. What is your current job or professional group?

☐ Patient Safety Officer/Manager

☐ Patient Safety Data Analyst

☐ Patient Safety Assistant

☐ Quality Care Officer

☐ Risk Management Officer

- ☐ Combined Patient Safety Officer and Other role

26) Do you work in:

- ☐ Medical Center
- ☐ Hospital
- ☐ Clinic / Ambulatory Facility

27). How many years' experience do you have in the patient safety officer role:

- ☐ <2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ >15 years

28). How many years' experience do you have in your professional group role:

- ☐ <2 years
- ☐ 3-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ >15 years

29). Are you:

☐ Male ☐ Female

30). With what health care profession are you affiliated?

- ☐ Nursing
- ☐ Allied Healthcare
- ☐ Management/Business
- ☐ Medicine
- ☐ Dental
- ☐ Pharmacy
- ☐ Education
- ☐ Other

Thank you, your time and input is highly valued in helping shape the future of RCA training and investigation support practices.

Please complete the survey by clicking on “submit.”

Appendix C: E-mail Letter Granting Permission to Use Bowie Survey

From: **Cynthia Lightner** <cynthia.lightner@waldenu.edu>

Date: Sun, Mar 17, 2013 at 3:40 P.M.

To: paul.bowie@nes.scot.nhs.uk, joe.skinner@nhs.net, carl.deteer@nes.scot.nhs.uk

Hello Mr. Bowie:

I am a postgraduate student, and I am in process of developing a study project that will focus on RCA actual performance post RCA training. I am an online student at Walden University in the United States of America, currently pursuing a doctoral degree in Adult Education. I work in the field of patient safety as a manager at a military medical treatment office.

I have a perceived concern that the quality of the RCA investigation is sub-optimal, despite the belief by the participants that the RCA training met their intended goals and objectives. My hypothesis focuses on unmet retrieval practice and transfer of learning needs, and I believe that my study will provide indications and findings on this problem.

Your study as entitled in the subject line of this email includes a questionnaire data collection tool that I think may be applicable to use in my study. Therefore, I am requesting a copy of your tool and permission to use the tool in my study. If allowed to use the tool, I will give full credit and recognition that it is your tool. I will also acknowledge and document your study in the manuscript and share the final project with you as well. If a fee applies to usage of a copy of the full questionnaire, please let me know, and I will pay accordingly on your terms. Your attentive reply to this email request is appreciated.

I also sent this email request to you per my personal email address. My intent was to ensure that
you received my email by either means. I appreciate your time to respond to me.

V/R,
Cindy

From: **Paul Bowie** <Paul.Bowie@nes.scot.nhs.uk>
Date: Mon, Mar 18, 2013 at 2:09 AM
To: carl.deteer@nes.scot.nhs.uk, joe.skinner@nhs.net, cynthia.lightner@waldenu.edu

Hi Cynthia

Sorry for delay and thanks for your interest in this work. I've been out of the office and will be until next week.

We used an online survey method based on the Australian study mentioned in the article. This is public domain so no permissions are necessary other than acknowledging the source. I don't have a paper-based copy therefore but I am assuming you can devise the questionnaire based on the questions, statements and scales in the article?

Let me know if you can do this otherwise good luck with your research

Best wishes
Paul

Appendix D: E-mail Regarding Validity Testing of Bowie Survey

From: **Paul Bowie** <Paul.Bowie@nes.scot.nhs.uk>
Date: Tue, Aug 13, 2013 at 4:28 AM
To: Cynthia Lightner <cynthia.lightner@waldenu.edu>

Hi Cindy

We simply adapted most of the Braithwaite questionnaire and added a few questions of our own - no attempt was made to validate the content or carry out reliability testing beforehand.

Hope this answers your question
Thanks again
Paul

Dr. Paul Bowie
Programme Director (Safety & Improvement)
NHS Education for Scotland
2 Central Quay
GLASGOW
Scotland, UK
G3 8BW
Telephone: 0141 223 1463
Work Mobile: 07769367643

>>> Cynthia Lightner <cynthia.lightner@waldenu.edu> 12/08/2013 02:46 >>>

Hi Dr. Bowie:

One more question please. The article on the research that you sent me previously and the article published in BMC did not speak to reliability and validity testing of the survey tool. Please inform if such analysis for reliability and validity occurred and if so, by what method. Specifically, was Cronbach's alpha coefficient or Kuder-Richardson or another analysis performed on the instrument/data analysis of the survey responses?

I respect that you are very busy and am very aware of the generous time that you are

taking to correspond with me.

Thank you,
Cindy Lightner

Appendix E: Permission to Use Employee E-mail Address

-----Original Message-----
From: [redacted]
Sent: Wednesday, March 12, 2014 12:37 PM
To: LIGHTNER, CYNTHIA R CTR USAF AFMOA AFMOA/SGHQ
Subject: RE: Permission Request for Utilization of Synensis Email List
-
Hi,

Permission to use the email list granted. Please add my email address to this list so that I can maintain a copy of any communications sent associated with granting this permission. Of course, I will not reply to the email or complete the survey so as not to skew the data.

-----Original Message-----

From: LIGHTNER, CYNTHIA R CTR USAF AFMOA AFMOA/SGHQ
[mailto:cynthia.lightner.ctr@us.af.mil]

Sent: Wednesday, March 12, 2014 12:36 PM

To: [redacted]

Subject: Permission Request for Utilization of Synensis E-mail List

Hello,

I know that we have discussed my doctoral study before, but now is the time for me communicate on the matter, with this documentation as a requirement per the University.

I am requesting permission to utilize the company's email list of employees who work under as patient safety managers (officers) for my dissertation (project study). I would like to utilize the email list as a means of communicating (anonymously) with the employee. They will be asked to voluntarily participate in my study. The study is being done to determine the levels of their RCA training and investigations as measured by their perceptions, attitudes, and experiences. An online survey tool will be utilized to obtain their data. My project is being conducted through Walden University. A confirmatory email would serve as my permission to utilize the email list.

V/R,
Cindy

Cynthia R Lightner, BSN, MSN, WHNP, RNC

Appendix F: E-mail Invitation Requesting PSOs Participation in the Study

Root Cause Analysis: Training and Investigation Experiences, Benefits, and Attitudes

As a doctoral student who has undertaken Root Cause Analysis (RCA) training and conducted RCA investigations, I am inviting you to participate in this study, by completing a survey. The study will examine the attitudes, experiences, and benefits of PSOs concerning RCA training and investigations. The survey takes 12-15 minutes to complete. The study, which is approved by Walden University, is looking at satisfaction with the RCA training course, skills learned and transferred to the workplace, attitudes regarding the benefits of RCA, and experiences from RCA investigations.

Your participation is very important and may result in improved future RCA professional development and investigation practices. The findings will be used to provide local and possibly national recommendations for changes in practice, design and content of RCA training courses or delivery of RCA investigations.

Your co-operation in completing this e-survey is appreciated. There is no compensation for participation in the survey. All responses are anonymous, and no individual's response will be identified

Sincerely,

Cynthia R Lightner, BSN, MSN, WHNP, RNC
Walden University Doctoral Student

Please go to the online survey, which takes about 13 minutes and click on the following link: http://questionpro.com/t/ALdPKZSwAM

Appendix G: Reminder E-mail Message

Root Cause Analysis: Training and Investigation Experiences, Benefits, and Attitudes

Friendly Reminder…

You were invited to take part in a research study to identify the attitudes, experiences, and benefits of patient safety officers' RCA training and investigation experiences. Your participation is very important, and the findings will be used to provide local and possibly national recommendations for changes in practice, design and content of RCA training courses or delivery of RCA investigations.

Your co-operation in completing the online survey would be appreciated. There is no compensation for participation in the survey. The survey is anonymous, and no individual's response will be identified.

I appreciate your participation because asking people like you who are trained and involved in RCA investigations to share your experience, may provide an understanding on the direction for future RCA training and investigations.

Please complete the short online survey now by clicking on the following link: http://questionpro.com/t/ALdPKZSwAM

Sincerely,

Walden University Doctoral Student

Appendix H: Confidentiality Agreement

CONFIDENTIALITY AGREEMENT

Name of Signer: Dr. Daniel Muraida

During the course of my activity in analyzing the data for this research: *Root Cause Analysis: Experiences, Benefits, Barriers and Time Since Training for Patient Safety Officers*. I will have access to information, which is confidential and should not be disclosed, I acknowledge that the information must remain confidential, and that improper disclosure of confidential information can be damaging to the participant.

By signing this Confidentiality Agreement I acknowledge and agree that:

1. I will not disclose or discuss any confidential information with others, including friends or family.
2. I will not in any way divulge, copy, release, sell, loan, alter or destroy any confidential information except as properly authorized.
3. I will not discuss confidential information where others can overhear the conversation. I understand that it is not acceptable to discuss confidential information even if the participant's name is not used.
4. I will not make any unauthorized transmissions, inquiries, modification or purging of confidential information.
5. I agree that my obligations under this agreement will continue after termination of the job that I will perform.
6. I understand that violation of this agreement will have legal implications.
7. I will only access or use systems or devices I'm officially authorized to access and I will not demonstrate the operation or function of systems or devices to unauthorized individuals.

Signing this document, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above.

Signature: Daniel J Muraida **Date:** 4/17/2015