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Nurse-Physician Teamwork in the Emergency Department

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Nurse-Physician Teamwork in the Emergency Department

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Nursing

by

David Oladipo Ajeigbe

2012

ABSTRACT OF THE DISSERTATION

Nurse-Physician Teamwork in the Emergency Department

by

Dvid Oladipo Ajeigbe

Doctor of Philosophy in Nursing

University of California, Los Angeles, 2012

Professor Donna McNeese-Smith, Chair

Background: Teamwork gained momentum in the 1980s. Research studies in the military and aviation demonstrated that teamwork is essential to safety. There were limited studies dealing with the practice of teamwork between nurses and physicians in the Emergence Departments (EDs). **Aims:** Descriptive aim of the study was to examine differences between staff in the Interventional and Control Groups on perception of staff teamwork. The exploratory aim was to examine staff perception of job satisfaction, work environment, autonomy, and control over practice. **Design:** The Interventional Group comprised four EDs that participated in teamwork training and operationalized its principles in their EDs. Control Group EDs comprised four EDs which did not participate in the training. Survey questionnaires were used for data collection. **Setting and Participants:** Staff from four Interventional and four Control Group EDs throughout California participated in the study. There were 191 participants from the Interventional Group EDs and 307 from the Control Group EDs. **Main Outcome Measures:**

Differences between staff who worked in the Interventional Group EDs and staff who worked in the Control Group EDs on perception of teamwork, job satisfaction, work environment, autonomy, and control over practice were assessed. **Results:** Staff who worked in the Interventional Group EDs showed significant differences compared with staff who worked in the Control Group EDs on staff perception of teamwork ($p = 0.006$), job satisfaction ($p < 0.0001$), work environment ($p = 0.006$), autonomy ($p < 0.0001$), and control over practice ($p < 0.0001$). There were no significant differences in satisfaction with care received by patients who received care in the interventional group EDs compared with those who received care in the control group EDs. Data on medical and non-medical errors were not collected due to lack of willingness to give approval by potential participating hospitals. **Conclusion:** Active teamwork practice between nurses and physicians in the EDs appeared to be associated with increased job satisfaction, perception of work environment, autonomy, and control over practice of both nurses and physicians who worked in the Interventional Group over those who worked in the Control Group EDs.

The dissertation of David Oladipo Ajeigbe is approved.

Linda R. Phillips

Linda Searle Leach

Paul R. Torrens

Donna K. McNeese-Smith, Committee Chair

University of California, Los Angeles

2012

DEDICATION

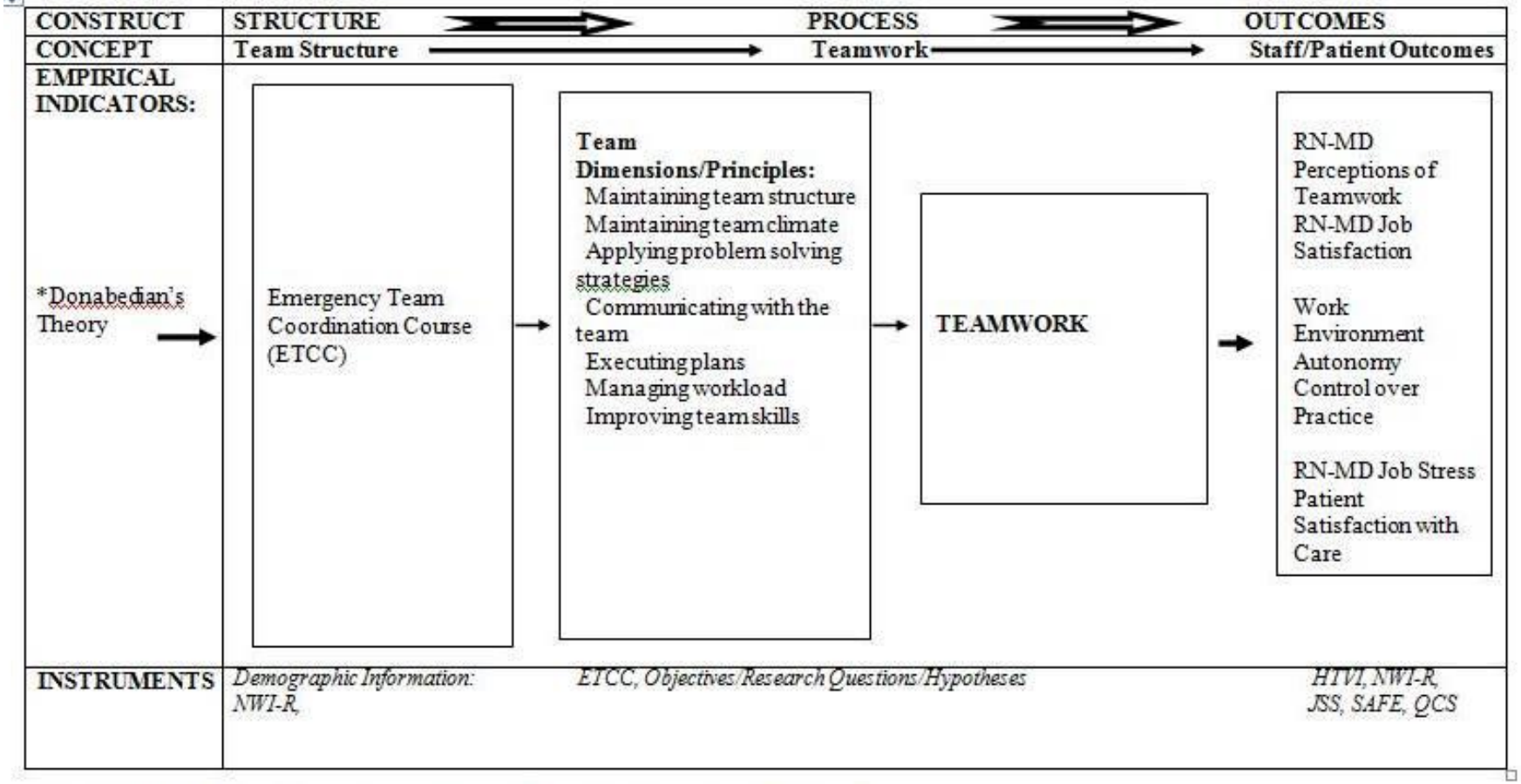
I dedicate this dissertation to my family, especially, to my wife, Ruth Mojisola Ajeigbe, who has stood with me throughout the many years that this doctoral program have taken, for giving me her full support, her constant encouragement, and her fervent prayers for my success. I remember her Biblical saying to me, "He who has begun a good job in you will complete it to the end." Whenever she quoted this Bible verse, I could feel a boost of energy and courage flowing through me. There were other occasions when I felt like quitting the doctoral program and on those occasions, my wife came to my rescue with another favorite quote of hers from the Bible: "I can do all things through Christ who strengthens me." Those words gave me peace and courage at times of discouragement.

I also dedicate this dissertation to our three sons who have allowed me to be by myself on many occasions to complete my doctoral studies, projects, and papers instead of being with them. There were occasions when I could not be with them on outings or sports but they all understood and gave me their full support. I remember occasions when I also got frustrated with Microsoft Word for not doing what I wanted it to do and a paper was due the next day. On those occasions, I turned to them for their youthful understanding of how the program works. Daniel, Paul, and Joseph, thank you for your understanding and support.

TABLE OF CONTENTS AND LISTS

Figure 1.

Nurse-Physician Teamwork



*Adapted/Modified from Donabedian's Structure-Process-Outcome of Quality Care Model
Donabedian, A (1988). The quality care: How can it be assessed: *Journal of American Medical Association*, 260(2), 1743-1748.

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It is with immense gratitude that I acknowledge Dr. Leach, one of the original members of my doctoral committee. Dr. Leach was an encourager to me through her remarks, inputs, and recommendations to improve my dissertation. I could count on her gentle push all the way. Thank you Dr. Leach. It also gives great pleasure in acknowledging Dr. Phillips, although not one of my original committee members, she readily accepted my invitation to become a member of my doctoral committee when there was a vacancy. I am very grateful to her for accepting my invitation and for all her contributions, which made my dissertation stronger. Thank you, Dr. Phillips.

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VITA/BIOLOGICAL SKETCH

David O. Ajeigbe, PhD, RNC, MS, MSN

Nurse Manager

Professional Experiences

2011 – Present – Nurse Manager.

- Manages and coordinates activities of Registered Nurses, Licensed Vocational Nurses, and Medical Assistants in coordination of patient care or access to care.
- Collaborates with Independent Physician Groups, internal and external. customers such as pharmacies, Primary Care Physicians, and Specialist.

2008 – 2010 Influenza (flu) Champion Fontana Kaiser Medical Center Service Area.

- Planned annual influenza vaccine program.
- Prepared yearly policy and procedure for flu vaccine campaign.
- Worked collaboratively with infectious disease physician in planning and implementing flu vaccine program.

2002 – 2010 Assistant Department Administrator Urgent Care, Kaiser Permanente Medical Center, Fontana.

- Supervised nurses, receptionists, physician extenders, per diem physicians, medical assistants, and lead registered nurses.
- Monitored financial performance and identified strategies to cut cost while improving quality of care as well as members' and employees' satisfaction.

1998 – 2002 Assistant Department Administrator Emergency Department,

Kaiser Permanente Medical Center, Fontana.

- Worked closely and assisting ED Administrator.
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Education

- California Baptist University, Riverside, BS, 1978, Biology
- Loma Linda University School of Nursing, Loma Linda, ASN, 1982, Nursing
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- California State University, Dominguez Hill, Carson, MSN, 1994, Nursing

Honors and Awards

- 1977 Academic Dean's List
- 1978 President's Honor Roll
- 2002 Robles Cota Fellowship Award

CHAPTER ONE

Introduction

Background of the Problem

The Institute of Medicine reported, in 1999, that medical errors in healthcare organizations accounted for about 44,000 – 98,000 deaths per year in the United States (Nordenberg, 2000). The conclusion by the same report, that it is human to err, led to a new focus on taking steps to improve patient safety (Adams & Bohan, 2000; Morrissey, 2004; Nordenberg, 2000; Wachter, 2004). Leape and Berwick stated that training and teamwork are essential for patient safety but the practice of such belief continues to lag behind (Leape & Berwick, 2000; Wachter, 2004). Baker and Norton (2001) stated that teamwork is required to have safer healthcare and that teamwork is the essential ingredient in the majority of clinical settings, as rigid status hierarchies are still present and are an impediment to teamwork (Baker & Norton, 2001). Teamwork is the sharing of common purpose and responsibility among healthcare professional members where each member clearly understands his/her function and the functions of other members. Together they combine skills and knowledge to provide effective health care service to patients (DHSS, 1981).

Historical Progression of Teamwork

Teamwork in medical care had difficulties due to lack of zeal for it. Lack of enthusiasm impeded early effects in teamwork in healthcare. The Dawson Report in 1920 provided the initial concept of teamwork. The report proposed that general practitioners (physicians) from health centers ought to work in multidisciplinary teams (Services, 1920). However; the idea of teamwork remained undeveloped until the Gillie Report of 1963, which recommended that community nurses be associated with a groups of practicing physicians (Council, 1963). The

midwives were to attach to the practices of the obstetrics and gynecologists in order to combine the care of infants and the mothers.

Enthusiasm for teamwork in medicine declined in the 1970s (Milne, 1980); however, it was revitalized in the 1980s when several documents argued that the most efficient way to deliver health care was through teamwork (Department of Helath and Social Security, 1981; Department of Health and Social Security, 1986; Welsh, 1987). In 1991, Queen's Nursing Institute report, entitled Quality Through Teamwork, depicted teamwork as the best approach to deliver complete and high quality health care (Institute, 1991). Although those claims were not substantiated by research studies (Poulton & West, 1993), they served as forerunners for empirical studies of teamwork. Although studies have shown the existence of multidisciplinary teams in primary health care; they did not show any evaluation of intra-professional teamwork which could have affected understanding of teamwork (Bond et al., 1985; Gilmore, Bruce, & Hunt, 1974; McIntosh & Dingwall, 1978). Moreover, there were no studies identified which were devoted to assessing the impact of teamwork on patient outcomes (Barnard, 1987; Welsh, 1987).

An area of team competency that was thought to be the most significant in the 1990s was mutual performance monitoring whereby each member of the team watched out for others (Hackman, 1990). Other areas of competency were the belief in the importance of teamwork (Gregorich, Helmreich, & Wilhelm, 1990) and a collective orientation or working towards a common goal (Driskell & Salas, 1992). Adapting to novel and unpredictable situations (Prince & Salas, 1993) and exhibiting flexibility were considered to be important, as well (Prince & Salas, 1993). Moreover, other areas of great interest to the researchers in the 1990s were effectiveness (Guzzo, Yost, Campbell, & Shear, 1994); cohesion, or working in unison (Mullen & Cooper, 1994); performing self correction through self monitoring (McLyntre & Salas, 1995); and

exhibiting assertiveness; that is, having confidence to speak up, to offer, and or clarify information given or received (Jentsch et al., 1995).

Research studies conducted in the military and in commercial aviation over a decade have demonstrated that teamwork is essential to flight safety (Risser et al., 1999; Salas & Cannon-Bowers, 2001). Evidence from an examination of flight records has shown that improved team process seemed to improve aviation safety (Brannick, Prince, Prince, & Salas, 1995). Despite research that has been done on the nature of teamwork, there is still no clarity or a complete understanding of the use of teamwork (Brannick et al., 1995).

Studies have also shown the importance of teamwork in achieving job satisfaction of the clinicians and patient satisfaction with the care they receive in the emergency department (ED) (Rosenstein, 2002). The Harvard Medical Practice Study II (N = 30,195 patients' medical records) showed about 3.7 percent of patients suffered disabling injuries (adverse events) due to the medical treatment they received (Leape et al., 1991). The same study showed that emergency department, labor and delivery, and the intensive care units accounted for a majority of those adverse events (Leape et al., 1991). Studies of the intensive care units showed that if teamwork was properly implemented there could be a reduction in errors or adverse events to the patients (Osmon et al., 2004). There are studies that showed an association between lack of teamwork or collaboration between nurses and physicians, and an increased tendency of the nurses to quit (Adams & Bond, 2000; Adams & Bohan, 2000; Anderson, 1996; Cowin, 2002; Larrabee et al., 2003; Rosentein, 2002). Research studies have shown that, in an area where situations are constantly shifting and where uncertainty is the norm, such as in aviation and EDs (DeBehnke & Decker, 2002; Risser et al., 1999), the main anchor, stabilizer, or buffer that holds the members together could be teamwork.

Some barriers to teamwork are created by the educational systems in both nursing and medical schools. Traditionally, in schools of medicine and nursing in the United States, individuality is encouraged and rewarded (Risser et al., 1999). Therefore, the educational systems are not congruent with teamwork expectations. It is no wonder then that clinicians have difficulties embracing a teamwork concept (Risser et al., 1999).

In a majority of institutions, individual success is valued and rewarded and an individual might be punished for errors (Morrissey, 2004). Studies have shown that a focus on teamwork is missing while individualism is common, and secrecy may even be the norm (Nordenberg, 2000). Errors are hidden instead of being disclosed for fear of reprisal (Nordenberg, 2000; Schmidt & Bottoni, 2003), and thus may result in diminished employee job satisfaction, and even patient dissatisfaction. When people, who have been rewarded for their individualism, are placed in an environment needing teamwork, it is essential that they be trained on teamwork principles and how to use such principles. However, emergency care providers may be expected to work together as teams without formal training to do so (Williams, Rose, Simon, & Consortium, 1999).

Summary of the Problem

The first issue with the emergency department setting is that healthcare workers are placed in a stressful environment due to rapidly changing conditions (Salas & Cannon-Bowers, 2001). Work situations in the ED are often chaotic (Handler, Gillam, Sanders, & Klasco, 2000; K. A. Williams et al., 1999) because of the life threatening conditions of the patients. The information needed to make split-second critical decisions is not always available (Williams et al., 1999) and this puts the healthcare personnel, including both nurses and physicians, under added pressure to arrive at a correct treatment regimen. In order to reduce the pressure on the

healthcare providers to manageable levels, increase positive patient outcomes, reduce errors, increase nurses' and physicians' job satisfaction, the work environment in the emergency room must be modified. Teamwork has been shown to enable the airline industry, with a similar level of unpredictability, to perform more efficiently and safely. Therefore, an active practice of teamwork could make pressures in the ED manageable and improve staff and patient outcomes.

A second issue that emergency room staff must deal with is that ED is a portal entry to a hospital, about 50% of hospital patients are admitted through the ED (DeBehnke & Decker, 2002), and staff must ensure patients are satisfied with their care in the emergency room (Aragon & Gesell, 2003; Bruce, Bowman, & Brown, 1998). Choice of ED or hospital is not determined by the price or geographical location as much as by the quality of service differentiating institutions (Tay, 2003); Devers, Brewster, & Caslino, 2003; Gift, Arnold, & DeBrock, 2002; Young, Burgess, & Valley, 2002). Therefore, it is important that hospitals invest in human and structural resources that enhance quality of care and increase patients' positive experiences. The practice of teamwork could improve the confidence that patients have with the healthcare teams by engendering the feeling that the members of the team all know their health issues and are able to provide them with needed care. Those feelings, by the patients or families, could result in a positive view of the emergency room.

Perceptions of patients and family members regarding the care they receive, especially in the ED, affect their satisfaction ratings of the ED and the hospital, and their willingness to recommend the ED to any of their acquaintances (Burroughs, Davies, Cira, & Dunagan, 1999; Campanella, Campanella, & Grayson, 2000); DeBehnke, 2002; Bourdreaux, 2000; Benchmarks, 1999). Active practice of teamwork could enhance the positive feelings patients have with their care in the ED and they might not only return for continued care but also recommend the ED to their acquaintances.

A third problem is that patients and family members have become more sophisticated in their knowledge and are more demanding of higher quality care for themselves or for loved ones. If patients or family members are not satisfied with the care they receive in an ED, the potential for lawsuit increases (Hickson et al., 2002). Worthington (2004) asserted that customer satisfaction has a great consequence on the financial health of an organization and on its reputation within the locality. However, with active practice of teamwork, there could be free flow of information within the healthcare teams; therefore, different healthcare members might not ask patients the same questions repeatedly and thus improve the impression that the healthcare team is communicating.

A fourth problem in the emergency department is attracting and retaining registered nurses. The nursing shortage has made this an imperative. Nursing school enrollment was declining until 2007, the nursing workforce is aging, and the number of employed nurses is decreasing. At the same time the acuity of patients is increasing and the workload on the remaining nurses is rising (Cowin, 2002). Increased workload leads to increased job dissatisfaction which leads to an augmented turnover of nurses in the healthcare system (Cowin, 2002; Sourdif, 2004). There is a growing concern that the nursing shortage has created a situation whereby fewer nurses than needed are being staffed to care for patients in hospital units. Some experts claim that reduced nursing staff has increased the patient-nurse ratio to unsafe levels, and might contribute to poor patient outcomes, nurses' burnout, and turnover (Vahey, Aiken, Sloane, Clarke, & Vargas, 2004).

In California, in response to the worsening shortage of nurses and increasing nurses' workload, increased burnout and lower nurse retention, the Californian State legislators mandated minimum hospital nurse-patient ratios in 1999, effective in July 2003 (Aiken, Clarke,

Sloane, Sochalski, & Silber, 2002). The strong support by staff nurses was an acknowledgement that nurse staffing levels have an impact on nurses' job satisfaction, retention, and perhaps on patients' outcomes (Aiken et al., 2002), and this was supported by policy formation.

A study by Shader, Broome, Broome, West, and Nash (2001) found that factors such as work satisfaction, job stress, work schedule, and group cohesion affected retention of nurses. The study showed a relationship between job stress, work satisfaction, group cohesion, and nurses' turnover. As job stress increased, group cohesion decreased, job satisfaction decreased, and intention to quit increased (Shader et al., 2001). Also, research has shown that stress and dissatisfaction among physicians has adverse effects on quality health care (Khuwaja, Queshi, Andrades, Fatmi, & Khuwaja, 2004). It is important to note that the greatest source of stress and job dissatisfaction reported in one study was interpersonal conflicts between nurses and supervisors and nurses and physicians (Anderson, 1996).

Some hospitals have modified their organizational characteristics to attract and retain satisfied nurses in the midst of nursing shortages (Scalise, 2002; Sullivan-Havens & Aiken, 1999; Upenieks, 2002). The study by Upenieks showed that magnet hospitals have improved job satisfaction of their nurses to the point that they have been able to overcome national nursing shortages and have been able to recruit and retain nurses.

Some healthcare organizations have moved away from the traditional eight-hour shift to implementing twelve-hour work shifts in an attempt to stave off nursing shortage, improve retention, increase job satisfaction of the nurses, and reduce costs (Hoffman & Scott, 2003). Although the approach was proactive and innovative, its impact on job satisfaction of nurses, job stress, and patients' outcomes is yet to be determined fully (Hoffman & Scott, 2003). However, in addition, research has shown that younger, less experienced nurses who tend to prefer twelve-

hour shifts were more stressed than their counterparts who worked eight-hour shifts, and safety has been shown to go down (Hoffman & Scott, 2003).

Teamwork could improve working relationships between nurses and physicians. This would significantly improve job satisfaction. In a hugely competitive healthcare market, it could be a motivator and a good job retention strategy for both physicians and nurses. It seems likely that when nurses and physicians are satisfied with their jobs, they are more likely to perform at their optimal level in caring for patients (Khuwaja et al., 2004).

In work environments where workers are put in dynamic, rapidly changing conditions, effective teamwork is necessary to achieve task success (Cannon-Bowers, Tannenbaum, Salas, & Volpe, 1995). Relationships between healthcare workers are paramount to job satisfaction; the relationships between nurses and physicians have a great impact on job satisfaction and retention for these professionals (Rosentein, 2002). Teamwork could create positive relationships among nurses and physicians.

Medication and medical errors are a fifth problem that occurs more frequently in healthcare institutions, especially in areas with high stress, unpredictable patient conditions, scarce and unreliable patient information, complex diseases and injuries (Leape et al., 1991; Weingart, Ship, & Aronson, 2000). Risser et al. (1999) asserted that under complex tasks, long hours of work, and detailed treatment, it is possible that any healthcare worker could commit errors. Work overload and inadequate staffing are some of the latent conditions that could create holes in the error defense mechanism (Baker & Norton, 2001). A previously mentioned study of 30,195 randomly selected patients' records showed 1,133 (3.7 percent) suffered preventable injuries due to errors they suffered during healthcare treatments (Leape et al., 1991). When ED healthcare providers do not coordinate care effectively or do not assist each other to prevent

errors, good patient outcomes could be compromised (Risser et al., 1999). Teamwork could reduce errors by improving communication between physicians and nurses, and increasing team member collaboration to prevent errors.

A possible solution to all of these problems might be teaching ED personnel to function as teams; Morey and colleagues developed a good example of such training, patterned after aviation-crew resource management. The Emergency Team Coordination Course (ETCC) was initially evaluated in a prospective multi-center quasi-experimental study conducted from May 1998 to March 1999 (Morey, Simon, Jay, Wears, Salisbury et al., 2002). The training was based on behavior and attitude modification, de-emphasizing hierarchies, communicating clearly, especially in emergency and stressful situations, and establishing effective teams, thus improving the emergency department's (ED) performance, and patient care (Hobgood, Xie, Weiner, & Hooker, 2004; Morey, Simon, Jay, Wears, Lalisbury et al., 2002; Risser et al., 1999; Wachter, 2004).

Teamwork education may be very useful in promoting job satisfaction of the staff, reducing stress, preventing errors, and creating higher patient satisfaction. This teamwork training might assist staff to accomplish needed tasks quickly and more efficiently (Salas, Dickinson, Converse, & Tannenbaum, 1992; Sundstrom, De Meuse, & Futrell, 1990)

Purpose and Significance of the Study

Purpose

This dissertation research proposal is a comparative analysis of the effects of teamwork education on emergency department (ED) staff (the registered nurses (RNs) and the physicians (MDs) in their practice of teamwork. It is also designed to determine the effects of teamwork practice, in the ED, on staff and patient outcomes. Data will be collected from hospitals in

California that are actively using the training from an Emergency Team Coordination Course (ETCC) versus hospital EDs in California that did not participate in the ETCC course.

Significance

Research has not been used to evaluate the influence of teamwork education as a possible solution to this very complex issue. However; the practice of teamwork in the ED could reduce errors and their effects, increase patient satisfaction, nurse and physician job satisfaction, reduce job stress, reduce turnover, and decrease the potential for malpractice lawsuits (Risser et al., 1999). The complexity of tasks, long hours of work, and difficult duties could induce the most conscientious, the brightest, and the most diligent healthcare practitioner to commit errors, but with teamwork such errors could be reduced (Leape, 1994; Leape et al., 2000; Risser et al., 1999) . The use of teamwork could benefit the hospital EDs by increasing their ability to provide safer care through reduced medical and medication errors to patients, and by attaining and retaining nurses and physicians.

The nurses and the physicians, using teamwork, may be better able to work collaboratively with mutual respect. Under such conditions, clinicians may be able to trust each other and act as watchdogs for each other in error prevention, and to assist each other in providing prompt care to patients (Risser et al., 1999). The reputation of the hospitals could improve, giving them a competitive edge in acquiring patients and staff.

This study is designed to compare differences in teamwork and its effects on staff and patients in four hospital EDs (interventional group) that are actively using the principles from an Emergency Team Coordination Course (ETCC) and four hospital EDs (control group) that did not participate in and are not using teamwork principles from the course.

To make teamwork operational in the ED, Morey et al, 2002, developed and implemented a teamwork-training curriculum (ETCC) to address circumstances in the ED. This was the first major training to make teamwork operational in the ED by teaching strategies to maintain team structure and climate, solve problems, maintain team communication, carry out plans and manage workload, and improve team skills. Three evaluations (one pre and two posttests) were conducted to determine the effectiveness of teamwork training on staff attitudes and behavior and patient outcomes.

This dissertation will address a comparative evaluation of differences between EDs that participated in ETCC and are actively practicing teamwork principles and the EDs that neither participated nor practiced its principles. The intent of the study is to determine the impact of ETCC in the effective practice of teamwork in the ED.

Descriptive aim of this study is to assess differences between the interventional group and control group on staff's (nurse and physician) perception of nurse-physician teamwork. The exploratory aim of this study is to assess staff and patient outcomes as measured by (1) staff job satisfaction (2) staff perception of work environment, (3) staff perception of autonomy, (4)staff perception of control over practice (5) staff perception of job stress, and (6) patient perception of satisfaction with care, and (7) medical and non-medical errors.

The next five chapters present: 1) a review of the literature and the gaps (chapter two); 2) the conceptual framework (chapter three); 4) methodology and procedure (chapter four); 5) result - summary of the findings and the three papers (chapter 5). The review of the literature (chapter two) concentrated on areas of the literature that deal with teamwork, barriers to teamwork, and facilitators of teamwork that directed the study. It showed the effects of teamwork on ED staff and on patient outcomes. Chapter three presented two conceptual frameworks: (1) Donabedian and colleagues' framework, the structure, process, outcome, model of quality care. The model

used structure, process, and outcome constructs. Chapter four showed the methodology that was be used to conduct the study including the design, the sampling process, instruments (data collection), procedure, and statistical analysis. Chapter five summarized the research findings and the contents of the three papers.

CHAPTER TWO

Review of the Literature

Emergency Department

Adams and Bohan (2000) stated that, although any human performance is prone to errors, the high rate of medical errors that occurs in the emergency department is exceptional and unacceptable. They suggested that an error prevention mechanism should be directed at individual behavior, systematic identification, and analysis. They identified ED as one of the busiest departments in the hospital, which operates under conditions of extraordinary stress due the high increase patient volume. There are no appointments for patients going to the EDs; therefore, it is difficult to have adequate staffing for the influx of patients that might occur from time to time. This unpredictable patient volume likely creates stress for the staff who are stretched too thin to meet the needs of the patients. Adding to the stress of patient volume is the fact that some patients present to EDs in a condition whereby they are not able to provide information to the healthcare team regarding their health problems.

Those pressures could lead to increased occurrences of errors in the EDs.

However, teamwork, if actively practiced in the ED, could reduce errors due to improved interpersonal relationships between the physicians and the nurses. Improved relationships could reduce the feelings of superiority or inferiority between the physicians and the nurses. When improved relationships exist, hierarchy could be reduced, and communication barriers between the nurses and the physicians could be removed. In some literature, one of the causes of medical and medication errors has been shown to be poor or inadequate communications. Although the ED is a very busy part of the hospital, an active practice of teamwork could promote an attitude whereby the staff are actively assisting each other and acting proactively to reduce stress and the occurrence of errors (Appendix 3h). Emergency department patients are highly complex and in

need of detailed evaluations. Potentially, they have acute medical needs, are highly knowledgeable, and have high expectations regarding their care. Caring for those patients in an environment of cost containment, where the focus has been more on saving money and cutting staff, has increased the complexity of providing care in this setting (Adams & Bond, 2000).

A study by Roseman and Becker (1995) showed a correlation between increased nurses' workload and increased medication errors. Sexton, Thomas and Helmreich (2000) stated that stress is an error inducer whereas teamwork is an error buffer.

Teamwork

Teamwork requires an environment where both nurses and the physicians contribute jointly, in a balanced relationship, characterized by mutual trust and respect. Teamwork and collaboration are interchangeable in the literature but in this study, the concept of teamwork will be emphasized.

Barrett, Fifford, Morey, Risser, and Salisbury (2001) defined teamwork as a group of people working together in a related area, or on a specific project in a complex situation, which results in more effective outcomes than could be achieved by individual efforts. Team interventions are most effective with tasks that require diverse responsibilities, a high level of judgment, complex decision-making, and a high investment and accountability for outcomes (Barrett, Fifford, Morey, Risser, & Salisbury, 2001).

Teamwork fosters mutual accountability for outcomes as a central team element. It represents a significant shift in thinking for health care professionals who have an educational and training system that emphasizes individual responsibility. Teamwork is protective by catching individual clinician errors and increasing patient safety (Barrett et al., 2001).

Brannick et al. (1995) described teamwork as a set of behaviors exhibited by two or more individuals as a function of coordinating requirements imposed by interdependent tasks in achieving common goals. These authors asserted that team coordination is the heart and soul of teamwork: it is the process, the moment-to-moment behaviors through which interdependent team members achieve tangible goals. Brannick et al. (1995) described team dimensions as assertiveness, decision-making, mission analysis, adaptability, flexibility, situational awareness, leadership, and communication. A team is comprised of a group of individuals with needs to share, who engage in cooperative action and interaction (interdependency) (Stout, Salas, & Fowlkes, 1997). These authors stated that the core of teamwork is the use of a collection of processes, strategies, and actions to make it possible for them to perform their overlapping tasks more effectively and more efficiently.

Teamwork Research

Teamwork is a critical element of the military to improve efficiency and as a necessity because the complexity of military tasks exceeds the capacity of a single individual efforts. A majority of research in teamwork has focused on aviation and the military (Baker & Salas, 1996).

The airline industry and military aviation have served as pioneers of teamwork processes and most other disciplines have looked to them for guidance in of how to do teamwork (Baker & Salas, 1996). While useful, research done in the airline industry and military is not entirely transferrable healthcare industry for several reasons. Aviation is under a single federal regulator (FAA) whereas the health industry is under Federal, state, local, and private regulators, each with differing requirements. The airline industry is less able to hide errors than the healthcare industry, and the mission and information needs of aviation industry are simpler than they are for the healthcare industry (Wachter, 2004).

According to a study by Alt-White, Charns, and Strayer (1983), nurse-physician collaboration is defined as a process in which nurses and physicians work together in delivering quality care to the patients. Alt-White, Charns, and Strayer's (1983) study (N = 446) related personal , organization, and managerial factors to nurse-physician teamwork in acute and non-acute settings.

Findings from the study showed a weak inverse correlation between nurses' length of service and collaboration ($r = -0.09$). There was a statistically significant correlation between working in the acute setting (primary care ICU) and nurse-physician collaboration ($r = 0.20$) and an inverse correlation ($r = -0.11$) between nurse-physician collaboration and working in non-critical adult units (Alt-White et al., 1983).

Effective communication and prompt resolution of problems correlated positively with collaboration. The following findings were evidence of the importance of communication in collaboration. The discussion with head nurse, $r = 0.13$, $p < 0.001$; conversation with clinical nurse, $r = 0.15$, $p < 0.001$; conversation with interns, $r = 0.17$, $p < 0.001$; conversation with residents, $r = 0.27$, $p = < 0.001$; conversation with attending physicians $r = 0.20$, $p < 0.001$; and using a communication book, $r = 17$, $p < 0.001$ (Alt-White et al., 1983).

Teamwork is essential to address patients' multiple complex needs and problems, which overlap professional boundaries. Teamwork has been employed in mental health, rehabilitation, and geriatrics but it is a fairly new concept in the ED setting (Heinemann, Lengacher, VanCott, Mabe, & Swymer, 1996; Heinemann, Schmitt, Farrell, & Brallier, 1999). Managed care has served as a driving force propelling hospitals to use human resources more effectively, and such effectiveness could be increased through teamwork (Heinemann et al., 1996). Teamwork promotes efficiency by decreasing fragmentation and duplication of efforts, improving quality of care, and enhancing cost effectiveness of care.

Teamwork could improve care delivery performance to reduce the number of clinical errors, by encouraging team members to actively coordinate care, and provide support to each other in the tasks of patient care. Teamwork provides increased control over rapidly changing emergency environments and it could serve as a safety net to protect both the patients and the caregivers from inevitable system and human failings and their consequences (Risser et al., 1999).

Perceptions that individual team members bring into teamwork could have a positive or a negative impact on teamwork. Sexton, Thomas, and Helmreich (2000) asserted that poor perception of team functions by team members could have adverse effects on team dynamics, causing team members to withdraw; but effective teamwork (positive perception) and adequate communication could have positive effects such as shorter patient stays, increased morale, improved job satisfaction, and efficiency.

Baggs et al., (1999) examined the relationship between nurse-physician collaboration (teamwork) in the intensive care unit (ICU) and patient outcome. Using a prospective, descriptive, correlational design and, utilizing a self-report questionnaire administered to attending physicians (N = 97), resident physicians (N = 63), and staff nurses (N = 162), the researchers conducted the study among medical ICUs (MICU), surgical ICUs (SICU), community hospital ICUs (CHICU), and patients (N = 1,432). Findings from MICU nurse reports showed a significant predicted correlation of collaboration to positive patient outcome. (Baggs et al., 1999).

Association between unit-level collaboration and patient outcomes yielded the following results (scores); CHICUs 1.0, SICUs 2.5, and MICUs 3.5. There were significant differences between the units with a chi-square of 8.62, two degrees of freedom, and $p < 0.02$. The researchers expressed concern that only the nurses' responses linked patient outcome to

collaboration but the physicians' linkage of collaboration was less significant to patient outcome and physicians' satisfaction. The findings might make it difficult to get physicians to view collaboration as an important relationship to promote (Baggs et al., 1999).

The findings of the study showed a high correlation between collaboration and patient outcomes in a healthcare setting with more complex patient situations as seen in MICUs. Therefore, collaboration in SICU and CHICU did significantly predict positive patient outcome. The researchers concluded that the findings provided support for nurse-physician collaboration (teamwork) in healthcare settings with high-risk patients (Baggs et al., 1999).

In a cross-sectional observational study of family practice office systems by Carpiano, Flocke, Frank and Stange (2003), staff role delineation and common vision among staff and physicians was an indication of teamwork. Research nurses made direct observation of 138 community-based physicians who participated in the study and collected data on physician practice characteristics (tools), teamwork, and tenacity. The research nurses observed the visits of 4,454 (89% of total patients) patients. Findings showed the presence of teamwork as evidenced by the presence of shared vision concerning immunization ($p = 0.002$), in clarity of staff role expectations as demonstrated in the effectiveness of immunization ($p = 0.001$). The researchers concluded that behavioral and attitudinal factors demonstrated the effects of teamwork more significantly in screening, counseling, and immunization than did any other factors. According to the researchers, the results supported other findings that staff teamwork was essential in monitoring, managing, and providing preventive services to the patients (Carpiano et al., 2003).

Lassen, Fosbinder, Minton, and Robins et al. (1997) examined the use of a collaborative protocol and its impact on newborn infection, cost, and newborn nursery. There were two protocols, protocol 1 and protocol II. In protocol 1 the nurse monitored the newborn and only

notified the physicians if the newborn was asymptomatic but had at least two risk factors; in that case, the nurse ordered a sepsis panel. If the newborn became symptomatic, the nurse initiated protocol II in which the nurse began a diagnostic workup and treatment and informed the physician. The physician could modify the treatment. Data collected at the pre-intervention period (control, 1991) were compared with data collected at the post intervention periods in two successive years (1992 and 1993).

In 1991, the total number of newborns admitted to well baby nursery were 961, out of which 83 were diagnosed with, "rule-out sepsis" (8.64%), 52 of these were treated with antibiotics (62.7%) and had total hospital stays of 200 days at a total cost of $73,660. After the introduction of the collaborative protocols (1992) there were 986 newborn nursery admissions and "rule out sepsis" diagnosis of 26 newborns (2.64%). Ten of these received antibiotics treatment (38.5%) with a total hospital stay of 55.2 days at a total cost of $21,660. In 1993, a repeat measures showed that 973 newborns were admitted and 19 of them (1.95%) were diagnosed with "rule out sepsis", 3 were treated with antibiotics (15.8%), and had 29 days of hospital stay with a total cost of $11,750.

The net gain associated with the collaborative (teamwork) protocols were significant decreases in the diagnosis of sepsis, needless hospitalizations, decreased exposure to antibiotics, reduced financial burdens to both the hospital and newborn babies' families, and reduction in anxiety of the families. There were improved interpersonal relationships between the physicians and the nurses, as frustration between the two groups was reduced. Nurses' autonomy in practice was protected as they interacted with physicians in diagnosing and treating patients, which resulted in better quality patient care. The researchers remarked that communication and interdependent relationships between the nurses and the physicians concerning patient care are essential ingredients in collaboration or teamwork (Lassen et al., 1997).

Nurses' and Physicians' Perception of Teamwork

A study by Zacharie-Bukonda (1996), using a 2 x 2 factorial experimental design, showed a statistically significant difference between the nurses and the physicians in forty-six (N = 46) hospitals with regards to their perception of teamwork. The nurses had a more positive perception and valuation of teamwork (M = 6.49, SD = 1.020, p = 0.011) than the physicians did (M = 6.20, SD = 1.072, p = 0.011). The correlation between personal valuation and hospital practice of teamwork was 0.1315, $p < 0.05$; correlation between personal valuation and eagerness to advance teamwork was 0.3956, $p < 0.01$; and the correlation between hospital practice of teamwork and eagerness to advance teamwork was 0.177, $p < 0.01$.

Hansen, Biros, Delaney, and Schug (1999) using a cross-sectional, explorational, and correlational design; studied perceptions of nurse-physician collaboration and its impact on usage of research findings in ED practice. The participants were comprised of 115 nurses and 51 physicians (N = 166). Variables assessed were perception of nurse leadership, physician leadership, openness of communication within groups, openness of communication between groups, problem solving within groups, problem solving between groups, timeliness of communication, communication satisfaction, and coordination within department.

Findings from the study showed significant differences in perceptions of physician leadership with F = 9.991 at p = 0.000; openness of communication within groups, F = 5.597, p = 0.005; openness of communication between groups, F = 6.034, p = 0.003; problems solving within groups, F = 7.432, p = 0.001, and problem solving between groups, F = 3.912, p = 0.023 (Hansen, Biros, Delaney, & Schug, 1999). However, perceptions of nurse leadership, communication satisfaction, timeliness of communication, and collaboration within department showed no significant differences. Overall, the nurses had lower perception of nurse-physician collaboration than physicians.

The researchers noted that research to demonstrate effects of systematic efforts to improve nurse-physician teamwork (collaboration) were scarce. The lack of research on nurse-physician teamwork in the ED setting is surprising as this is an area where nurses and physicians perform overlapping tasks and decision making functions related to diagnosis and treatment of patients (Hansen et al., 1999).

Baggs and Schmitt (1997) examined perceptions of nurses' (N = 10) and resident physicians' (N = 10) perceptions of the process of collaboration in the MICU. An open-ended audio-taped qualitative interview design was used. A major part of the interview dealt with antecedents to teamwork, such as, being available physically and being receptive. Being available pertained to the aspects of time, place, and knowledge. The respondents stated that the medical intensive care unit (MICU) was small and that the units were too noisy and thus hindered adequate communication between the staff. On the other hand, they stated that the size of the units created proximity between the staff and facilitated teamwork (collaboration) (Baggs & Schmitt, 1997).

The residents were assigned three to six week rotation in MICU and during those weeks the residents on duty stayed overnight on the units creating many opportunities for interactions between the nurses and the residents. The respondents perceived knowledge to be important. Residents were more likely to collaborate with nurses that they were perceived to be knowledgeable. Being receptive was another aspect of being available. The respondents defined collaboration as working together (sharing) as a team (Baggs & Schmitt, 1997). Outcomes outlined by the respondents as benefits of collaboration were: ameliorating patient care, which was achieved through rapid action; information maximization; care planning; better feelings regarding job; pleasant job environment and learning; and cost control (Baggs & Schmitt, 1997).

Hojat et al. (1997) compared medical and nursing students' attitudes toward physician-nurse alliance using 408 medical students (208 first year and 200 second year) and 149 nursing students (64 first year and 85 second year). About 85% of the nursing and medical students agreed that nurses should participate in decision making related to their work. Both groups agreed that medical students ought to participate in teamwork with the nurses and that nurses were able to evaluate patients' socio-psychological needs. They agreed that nurses are legally liable to the patients they care for and that nurses are experts in providing education and counseling to patients. The nursing students and medical students stated that there are various overlapping responsibilities between the nurses and the physicians in the care of patients and that medical education curricula should emphasize inter-professional relationships between nurses and the physicians. Both groups agreed that the more highly educated the nurses became, the less interested they became in bedside patient care (Hojat et al., 1997).

However, the two groups (nursing and medical students) were in disagreement about the following variables: Medical students (67%) and nursing students (30%) stated that physicians should have a dominant role in patient care and 91% of medical students and 60% of nursing students stated that physicians should have a greater role in patient education and counseling. Seventy-eight percent (78%) of the nurses and 47% of medical students responded that nurses should be able to use their discretion to modify patient care. Eighty percent (80%) of nursing students and 50% of medical students agreed that patients feel more comfortable dealing with the nurses than with physicians. Nursing students (97%) and 79% of medical students said nurses should be perceived as collaborators with physicians rather than as servants. In reality to patient discharge, 92% of the nurses and 72% of medical students felt the two should work collaboratively. Nursing students (85%) and 67% of medical students agreed that nurses should be responsible to evaluate effects of treatment on patients. Thirty percent (30%) of medical

students and 15% of nursing students agreed that nurses' main role is to carry out physicians' orders. Medical students (34%) and nursing students (21%) felt that nurses aspire to secure more authority for patient care than for which they (the nurses) are qualified. Concerning nurse-physician collaboration being part of medical school curriculum, 97% of nursing students and 92% of medical students agreed. Concerning questioning physicians' orders, 95% of nursing students and 88% of medical students responded in the affirmative (Hojat et al., 1997).

In comparing critical care nurses' and physicians' attitudes regarding teamwork, Thomas, Sexton, and Helmreich (2003), using a cross-sectional design, studied 90 physicians and 230 nurses (N = 320) in eight non-surgical intensive care units. There were significant differences between nurses' and physicians' attitudes regarding teamwork. Thirty-three percent of the nurses gave high or very high rating to collaboration and communication between nurses and physicians. However, 73% of the physicians gave high or very high rating to nurse-physician collaboration and communication. Differences in perception of teamwork between the nurses and physicians were related to the nurses' feelings that their inputs were not sought or were marginalized, disagreements were not settled appropriately, or there was poor reception for their input.

The researchers noted that the discrepant attitudes between the nurses and the physicians regarding teamwork might be related to hierarchical status gradient, responsibilities, and educational, gender, and cultural differences between nurses and physicians (Thomas, Sexton, & Helmreich, 2003). The researchers concluded that the nurses and physicians might gain from training in assertiveness, conflict resolution, active listening, and ways to conduct effective collaborative rounds.

Teamwork Training

Educational systems in nursing and medicine have done a good job of teaching clinical competency, but have failed in teaching teamwork (Risser et al., 1999). Watchter (2004) noted that medical and nursing education has neglected teamwork training and providers have not been expected to undergo teamwork training; therefore, the potential value of teamwork has not been realized. However, if teamwork is to succeed in the ED, teamwork training should be given to the nurses and physicians prior to evaluating teamwork performance (Risser et al., 1999). Effective teamwork does not happen spontaneously; it requires long-term organizational investments in training and resources. Airlines have changed from training individuals to training the group because of the realization that safety and good performance was not just a function of the captain alone but of all crew members, as well (Sexton et al., 2000). The committee on quality of health care in America has recommended that healthcare organizations implement teamwork-training strategies for personnel in intensive care units, operating rooms, and in emergency departments due to the acuity of the patients. The committee suggested that such training should be patterned after the crew resource management (CRM) methods used in aviation (Kohn, Corrigan, Donaldson, & McKenzie, 2000). Crew resource management is the formal training started in aviation over two decades ago, which has led to a significant decrease in aviation accidents. Crew resource management was based on the principles that crew communication and coordination (behaviors) could be identified, taught, and applied in high-stakes environments. Although those behaviors could occur spontaneously, they might not be practiced reliably, consistently, or efficiently without well established training and reinforcement (Helmreich, 1997; Helmreich & Foushee, 1993).

One approach called MedTeams focuses on involving ED staff in a common set of teamwork behaviors (Barrett et al., 2001). The training and evaluation were based on five

teamwork dimensions with 41 associated behaviors. The teamwork dimensions included in the training were: (a) maintaining team structure and climate, (b) planning and problem solving, (c) communicating with the team, (d) managing workload, and (e) improving team skills (Barrett et al., 2001)..

Sherwood, Thomas, Bennett, and Lewis (2002) noted that critical care environments are fast-paced, with intense decision-making coordinated by a constant network of providers, with little attention to the human factors involved. Sherwoood et al. (2002) stated that it is necessary when introducing teamwork to create a lasting cultural change. The cultural change requires providers to develop new skills geared towards the development of emotional competencies to sustain critical intelligence in an organization, which puts emphasis on values. Emotional competencies are the attributes or traits of emotional maturity that could be manifested in willingness to share power, feelings of self worth that allow an individual to seek input from others, mutual trust, and empathy. They observed that delivering the right care to the right patient at the right time, in the right way, to achieve the right outcome, is one of the paramount goals of healthcare for which teamwork could be used as a vehicle (Sherwood, Thomas, Bennett, & Lewis, 2002).

Barriers to Teamwork

Barrett et al. (1982) identified four causes of teamwork failure. The causes are: (a) failure to identify an established protocol for patient care and for treatment plans; (b) failure to advocate and assert an alternative plan or corrective course of action when a question arises about patients' care; (c) failure to prioritize caregiver tasks for the patient; and (d) failure to cross-monitor actions of other team members. According to Heinemann et al. (1999), some physicians perceived teamwork as a wedge between them and their patients and viewed teamwork meetings as a waste of time. Some perceived shared leadership in a team as a threat to their traditional

status and ultimate authority (Heinemann et al., 1999). Findings from the study indicated that the team might lose focus if there is no strong managerial leadership over the team, no constant reiteration of aims within the team, lack of feelings of having advancement, and failure in allocation of responsibility (Leape et al., 2000).

Zwarenstein and Reeves (2002) stated that improvement in patient safety and quality of care depends on teamwork. However, they added, poor communication and inadequate collaboration between the nurses and the physicians can endanger teamwork. Divergence of nursing and medical goals could lead each profession acting independently to meet its proprieties (Zwarenstein & Reeves, 2002). Other factors that Zwarenstein and Reeves noted as barriers to teamwork between nurses and physicians were lack of readiness to collaborate and lack of willingness by either profession to allow the other professional group to take a leading role in promoting teamwork

In a study of communication barriers between registered nurses (n = 59) and physicians (n = 47), Cadogan, Franzi, Osterweil, and Hill (1999) used questionnaire design to examine differences in perception between the two groups (nurses and physicians). The variables examined were nurse competence, time burden of calls, necessity of calls, professional respect, and language comprehension.

On a scale of 1 – 5, with 1 being lowest and 5 being highest, physicians gave nurses lower mean ratings than the nurses gave themselves on nurse competencies.. On the ability of nurses to distinguish urgent from non-urgent problems nurses scored the RNs with a mean rating of 3.7 and the physicians rated RNs at 2.7, ($p < 0.0001$). In identifying problems in a timely manner, nurses rated the RNs' competency at a mean of 3.4; however, physicians rated the RNs at 2.6 ($p < 0.0001$). On whether or not RNs know how to assess patients before calling physicians, nurses scored RNs at 3.8, but physicians rated RNs at 2.3 ($p < 0.001$). On the clarity,

conciseness, and completeness of explaining patients' problems, the nurses rated the RNs at 3.2 and physicians rated RNs at 2.5 ($p < 0.0001$).

Nurses and physicians were significantly different in their mean score in response to the variable of the triviality of the calls they received or placed (higher rating equals greater perception of triviality of calls), with the nurses giving calls a mean score of 2 and the physician scoring them at 2.9 ($p < 0.01$). The nurses rated the respect between RNs and MDs less favorably (2.1) than physicians who rated the encounters more favorably at a mean score of 3.3 ($p < 0.0001$). Foreign speaking physicians perceived that nurses have more difficulty understanding them (1.3) than nurses did (0.8) with a significant difference at $p < 0.05$ (Cadogan et al., 1999).

Overall, nurses perceived barriers to effective communication between nurses and physicians to be due to lack of respect by the physicians. However, physicians did not see lack of respect for them by the nurses to be a barrier. The perceptions by physicians that nurses' calls were unnecessary might provoke an angry reaction from the physicians which the nurses, on the other end of the phone, perceived as lack of respect for them (Cadogan et al., 1999).

Cox (2003) studied the impact of intra-personal, intra-group, and inter-group conflict on team performance effectiveness and work satisfaction, using a non-random sample of 287 nurses. Intra-personal conflict is a contradiction of values that exists in a person's mind (Lewis, 1976); intra-group are differences related to the activities, goals, and functions among group members (Lewis, 1976); and inter-group conflict is characterized by differences or disagreement over resources, lack of clear jurisdictions, differentiation of system, and discrete boundaries between knowledge and authority (Rahim & Bonoma, 1979).

Intra-personal conflict positively and directly affected intra-group conflict ($b = 0.35$, $p < 0.000$) and intra-personal conflict had a negative impact directly on job satisfaction ($b = -0.31$, $p < 0.000$). Intra-group conflict had a direct positive effect on inter-group conflict ($b =$

0.55, $p < 0.000$), and significant negative effects on the effective functioning of the team ($b = -0.54$, $p < 0.000$). Intra-group conflict also had direct negative effects on job satisfaction ($b = -0.31$, $p < 0.000$). Team functioning effectiveness was directly and significantly associated with job satisfaction ($b = 0.25$, $p < 0.01$). The strongest determinant of job dissatisfaction was intra-personal conflict. The more intra-personal conflict increased, the less satisfied the respondents were with their jobs (Cox, 2003).

Facilitators of Teamwork

According to Alt-White, Charns, and Strayer (1983), personal factors (educational level and longevity on the job), organizational factors (staffing styles), and managerial factors (quality of communications style and staff support) contribute to nurse/physician collaboration and teamwork. Nurses with advanced education are expected to collaborate well, and those who have been nurses longer, or have worked on a hospital unit longer, are also expected to collaborate better because of the positive relationship they might have established with physicians over the years. However, the reverse could be true if nurses have accumulated negative relationships with the physicians (Alt-White et al., 1983). Physicians' attitudes about teamwork are important because physicians serve as gatekeepers and managers of teams; they have a great influence over the organization of teams; and they determine which patients are admitted or discharged from the healthcare systems (Heinemann et al., 1999).

In highly specialized areas, such as intensive care units, the conditions of the patients enhance close collaboration between nurses and physicians. The use of primary care (total patient care) nurses in specialized areas promotes close association and understanding between the nurses and the physicians, which is an ideal condition for nurse-physician teamwork (Alt-White et al., 1983).

Two managerial factors enhance collaboration: The fist is approaches to coordination, which could affect communication because the more open the communication environment, the more mutual respect between the nurses and the physicians, and the more likely collaboration can occur between them. The second is organizational stress which is the amount of support the organization (manager) gives to staff, with more support being associated with more collaboration (Alt-White et al., 1983).

Boyle and Kochinda (2004), using a descriptive pretest-posttest design, studied the effects of an enhanced collaborative communication intervention of nurses and physicians in intensive care units. The intervention pertained to leadership, coordination, conflict handling, problem resolution, and team-oriented behavior. The participants were physician leaders ($n = 3$) and nurse leaders ($n = 7$). The posttest mean score increased to 75.33 from a pretest mean score of 56.67 ($t = 2.806$, $p = 0.02$). There was no significant improvement in relationship skills which was high in pretest and stayed high at posttest (mean score = 78.57 and 77.14 respectively) with $t = -0.176$, ($p = 0.864$). In addition, the nurse leaders' self-report of collaborative communication problem resolution, conflict control, and coordination improved post intervention ($p \leq 0.001$).

According to Baker and Salas (1996), critical team behaviors are organized around seven skill dimensions: (a) giving suggestions or criticisms, (b) cooperation, (c) communication, (d) team spirit and morale, (e) adaptability, (f) coordination, and (g) acceptance of suggestions or criticisms. In their research, Baker and Salas demonstrated that the behaviors that resulted in successful teamwork were: (a) checking information sources for agreement or confirmation, (b) providing assistance to other crew members as needed, and (c) informing crew members of mission in progress (Baker & Salas, 1996).

In a study of nurse-physician collaboration, Anderson and Fin (1983) found that using primary nursing, using integrated patient records, encouraging nurse decision making, forming a

joint practice committee, and reviewing patients' records jointly by the nurses and physicians improved collaboration. Because of nurse-physician collaboration, patients' satisfaction with the care they received increased. The patients felt that the nurses and the physicians knew them better and cared about them more.

According to Stout, Salas, and Fowlkes (1997) team members need to possess adequate knowledge to carry out their team tasks, which include an understanding of member's roles and responsibilities, reminder-strategies, and shared mental goals. These authors further identified the following three essential skill dimensions for effective teamwork: First of the dimensions is communication, which is manifested in acknowledging the message sent or received, providing information as requested or as needed, repeating information, using standard terminology, asking for clarifications, conveying information concisely, verbalizing plans for procedures and maneuvers, and using non-verbal communications appropriately. The second dimension is assertiveness, which is characterized by the ability to ask questions when uncertain, make suggestions, state own opinions on decisions or procedures, confront ambiguities and conflicts, and maintain position when challenged. Last is situational awareness which enables commenting on deviations, providing information in advance, identifying problems or potential problems, demonstrating awareness of task performance of self and others, verbalizing a course of action, and demonstrating continuing awareness of the state of the mission.

Outcomes

Errors

Allnutt (1987) stated that despite quite stringent selection processes of both the pilots and physicians, and despite many years of training are as liable to commit errors as any other human being, with more or less training. Based on the definition of error, as any performance that

diverges from the ideal, the assertion is that both pilots and physicians, just as any other human being, commit many errors daily.

Allnut stated that errors involved in daily activities are numerous; however, the good news is that most of them result in no adverse events. All human beings without exception commit errors and error commission is part of human existence (Allnutt, 1987).

An incident is an occurrence that could decrease the safety margin of the patients. The incident may, or may not be, avoidable and the causes of incidents may or may not be human error (Beckmann et al., 1996). Reason (1994) likened unsafe acts to mosquitoes: trying to kill one mosquito at a time could never get rid of mosquitoes but draining the swamp where they breed could eliminate them. He equated errors in medicine to mosquitoes and the swamp. He equated the swamp to latent factors, such as high workloads, equipment design, budgetary constraints, competitive pressures, poor communication, procedures that have to be ignored or violated to get the tasks accomplished, inadequate organizational systems, and absent safeguards and barriers (Reason, 1994). Reason asserted that the cause of mistakes was not a mindset of individuals to make mistakes but rather, the fact that healthcare professionals are human beings who are inherently prone to making mistakes. However, with good safety systems in place, those latent factors can be detected, eradicated, or corrected prior to a calamity (Reason, 1994).

Reason (1990) described three different types of basic errors that all caregivers are susceptible to commit. They are the errors of slips, lapses, and mistakes, which are called active failures. He defined slips as errors resulting from lack of proper adjustment to undertakings that could be performed effortlessly. This type of error is generally committed by experts, not novices. Lapses are errors caused by forgetfulness, the root cause of which, according to Reason, is task overload, or distractions (preoccupations). The third type of error is a mistake, which is

choosing wrong actions because of improper classification of a situation or lack of consideration of all relevant aspects in making decisions (Reason, 1990).

Reason enumerated two types of approaches to human imperfection, which he termed as person and system approaches (Reason, 1990). He differentiated person approach from system approach in the following ways: Person approach was based on scape-goating individuals at the "sharp end" (those in direct contact with the patients) such as the physicians, anesthetists, nurses, surgeons, pharmacists, and other healthcare personnel who are involved when an accident or error occurs (Reason, 1990). Those directly involved with the patients are considered to be the culprits in that the causes of errors are perceived to be due to their forgetfulness, carelessness, recklessness, inattentiveness, negligence, and poor motivation (Reason, 1990).

The solution from those at the "blunt end" (managers and those higher up in the organization), to what they perceived to be human failings, are to induce fear, make more posters, enact disciplinary procedures, write additional policy and procedure directives, inflict guilt and shame through blaming, institute retraining programs, and bring threat of litigation to the forefront Reason, 1990). Reason noted that the causes of some errors were human failings that must be addressed and individuals should be held responsible. However, he cautioned that a strong emphasis on human failing and blaming individuals (reactive mode) might serve immediate, temporary satisfaction in assigning responsibility for the wrong done, but it also might prevent channeling efforts to make needed and lasting system changes (Reason, 1990).

Reason discussed the Swiss cheese model of the system approach. There are defenses, safeguards, and barriers, called slices, such as procedures and administrative power, technologies, and humans that reside in strategic locations on the system. Ideally, each defense layer (slice) should be unbroken, but those defensive slices have holes like Swiss cheese. The holes in the system, unlike Swiss cheese, are dynamic, constantly moving, and changing status.

The hole in each defensive slice does not create problems (errors); however, errors occur only when conditions exist that allow all the holes to line up and permit errors to reach a target (the recipient of care) (Reason, 1990) .

The systems approach views errors as inevitable because of humans are fallible (Adams & Bohan, 2000b). Humans are not viewed as the problem but the conditions on the jobs (latent conditions) allow error to happen. Therefore, rather than attempting to change human conditions, the workplace conditions should be changed. Reason suggested that organizations should focus their attention to build defenses, redundancies, and safeguards to make it difficult to commit errors, and to minimize the effects of errors when committed(Adams & Bohan, 2000). Organizations, which are highly reliable concerning excellent safety records, put human inadequacy into account in preventing errors. They are proactive in preventing errors rather than being reactive after errors have happened.

A study by Marx (1997) of aviation maintenance showed that 90% of quality gaps were not due to human culpability. According to Baker and Norton, it is futile for systems to count on imperfect individuals to perform flawlessly in the presence of circumstances that make committing errors possible. They suggested that personalizing errors and punishing individuals closest to the errors (active conditions) rather than looking for systems' solution is futile. This might create a sense of satisfaction but would not remove the latent conditions from the systems and, therefore, would not eliminate errors (Baker & Norton, 2001).

In aviation, much progress has been made to create a culture that deals effectively with errors; however, in healthcare, substantial pressure exists to cover up errors and this has led to unchecked error commission and missed opportunities to make improvements (Sexton et al., 2000). Morrissey (2004) noted that aviation and nuclear power plants are two highly dependable industries which, due to the intrinsic risks involved in their activities, have placed

prevention of errors and accidents as their priorities. Aviation built a culture around the concept that errors are unavoidable and that everyone is susceptible to committing them; therefore, aviation developed fail-safe procedures to arrest errors. Morrissey (2004) admonished healthcare executives to put patient safety above budgetary and financial considerations and to build an organization for patient safety.

In 1991, the Harvard Medical Practice Study, a population based study of iatrogenic injury of hospitalized patients, found about 4% of the patients (98,609 patients) suffered injuries that caused measurable disability or extended hospital stays, and about 14% of those injuries resulted in death (Leape et al., 1991). Leape (1994) stated that if the same rate of fatal iatrogenic incidents happened throughout the United States, it would result in the death of about 180,000 people per year. Leape (1994) equated that rate of death to three jumbo-jets crashing every other day. If that were to happen there would be great public outrage but because medical errors occur one at a time in multiple healthcare locations throughout the country, with little or no publicity, they have not received the type of attention it deserves.

Safety in aviation might be motivated by personal life preservation of the crews who fear dying with the passengers if errors lead to an airline crash. Occurrences of errors in the healthcare industry do not lead to the deaths or injuries of the healthcare personnel. This may be one reason why the urgency for patient safety has not been among the major priorities in healthcare (Wachter, 2004).

A 1995 Australian study of quality in healthcare examined medical records of 14,179 admitted patients in 28 hospitals. In that sample, the occurrence of adverse events (AEs) was 16.6%, 13.7% of which caused permanent disability to patients, and 4.9% resulted in patients' deaths. Fifty-one per cent of adverse events (medical errors) were preventable. Patients with complicated illnesses needing immediate care and life saving interventions had the most chance

of suffering adverse events or death. The study estimated errors caused about 18,000 preventable deaths and over 50,000 disabled patients (Wilson, Runciman, & Gibberd, 1995).

Studies by Brennan et al. (2004) showed that ED care exposed patients to an increased occurrence of adverse events. According to their findings, the root causes for exposure to adverse events in the ED were associated with the use of part-time physicians without specific emergency medicine training to arrive at a definitive diagnosis, mismatched or shortened treatments, and severity of sickness of patients.

Andrews and Stocking (1997), using a qualitative observational design, studied adverse events in 1,047 patients. Findings showed that about 17.7% (185) of patients experienced at least one serious adverse event that prolonged their hospital stays, 9.8% of adverse events were associated with administrative decisions, 15.6% were due to interactive origins, and 37.8% were related to individuals. There was a 6% increase in adverse events with each day of additional hospital stay (Andrews & Stocking, 1997).

Leape et al. (1994) found that of about 98,609 patients who had injuries, 28% of their injuries were due to negligence. They defined negligence as the failure of the practitioner to perform up to a reasonable level expected of an average practitioner qualified to take care of similar patients. The study showed that medical errors were common and that most adverse events were preventable, especially those resulting from negligence. Human undertakings are prone to errors but minor errors in highly technical and complicated systems, such as healthcare can have disastrous outcomes (Leape et al., 1991).

The Institute of Medicine (IOM) estimated that between 44,000 and 98,000 patients die each year, not because of their health problems but from preventable errors committed by those who were caring for them (Kohn et al., 2000). The estimated 44,000 – 98,000 involved hospital errors, however, similar situations occur in other settings where patients received healthcare,

such as doctors' offices, outpatient surgical centers, clinics, nursing homes, retail pharmacy outlets, and other healthcare institutions (Kohn et al., 2000).

Wilson et al. (1995), in an Australian review of 14,179 medical records, showed adverse events categorized by point of care as follows: 8-9% happened in doctors' offices; 2-3% in residential homes; and 1-2% in nursing homes, the remainder occurred in hospital- related healthcare settings. However, the result did not include patients with adverse events that were not serious enough to warrant admission to hospitals; therefore, this study might be an underestimates of adverse events in non-hospital categories (Wilson et al., 1995).

In a 1992 study of incidence and types of adverse events and negligent care in Utah and Colorado, 5,000 and 10,000 medical records were retrospectively sampled. The researchers reviewed 4,943 of 5,000 (98.9%) and 9,757 (97.9%) of 10,000 charts (Thomas et al., 2000). Findings described the percentage of adverse events by type of location: 44.9% of all adverse events occurred in the operating theater of which 16.9% were due to negligence and 16.6% caused permanent disability. Adverse drug events accounted for 19.3%, and of that figure 35.1% were due to negligence with 9.7% resulting in permanent disability (Thomas et al., 2000). Eighty percent (83.8%) happened in the hospital; 45.8% adverse events happened in patients' rooms; and 52.6% happened in the ED (Thomas et al., 2000). Other locations where adverse events occurred were the physicians' offices and patients' homes, that accounted for 7.0% and 3.4%, respectively (Thomas et al., 2000).

When compared to all hospital locations in the Utah and Colorado study, the emergency department had 52.6% negligent adverse events, with 94.6% of negligent adverse events ascribed to the emergency department physicians. The researchers speculated that the reasons for the high rate of negligent adverse events in the ED might be due, in part, to task sophistication (Thomas et al., 2000).

Weingart et al. (2000) studied 1,025 Medicare beneficiaries, using administrative data to determine quality of inpatient care. They found that failure to provide preventive treatment occurred in 12 out 20 surgical cases, in 9 out of 14 medical cases of deep-vein thrombosis pulmonary emboli (DVT-PE), in 12 out of 17 surgical, and in 9 out of 16 medical cases associated with technical care problems, that resulted in bleeding or hematoma after procedures. They also found that technical care problems existed in 11 out of 13 cases leading to lacerations and perforations, 0 out of 15 cases required remedial surgical procedures; mechanical complications occurred in 10 out of 14 cases, and surgical wound infections happened in 7 out of 11 cases.

Weingart, Ship, and Aronson (2000) noted that errors and mishaps are difficult to manage because adverse events are habitually illusive and it is not easy to associate either the underlying patient condition or the complex medical treatment to poor patient outcome. Other reasons for the illusiveness of AEs originate from incomplete incident records due to fear of lawsuits, economic penalties, peer disapproval, and administrative restrictions. In order to allay fears and to get more reliable AE reports, Weingart et al. (2000) used a simple low-cost method to assess problems associated with quality care causing iatrogenic harm to admitted patients. Using the method, the researchers were able to find an occurrence of 2.6% AEs. The finding corroborated result of AEs from other studies (Weingart et al., 2000). The importance of recognizing and probing AEs was to gain knowledge necessary to change performance so AEs risk was reduced and better quality of health care is advanced (Walshe, 2000).

The safety record of the aviation-industry has been identified as a target for the healthcare industry. It is estimated that, with the impeccable safety record of the airline industry, a passenger would have to fly non-stop for 438 years before being involved in a single deadly airline accident (Kohn et al., 2000). Accidental death statistics that deaths caused by motor

vehicles averaged about 43,458 annually, breast cancer 42,297, and autoimmune disease syndrome (AIDS) 16,516 annually, but the study of healthcare industries showed medical errors with 44,000 – 98, 000 deaths annually exceeded deaths from the above numbers and stood as the eighth leading cause of death annually in the United States (Kohn et al., 2000).

Leape et al. (1991), in a study of 30,195 patients' medical records in 51 hospitals, identified some factors that increased the chance for adverse events. The factors were complexity of the disease or treatment, inadequate staffing levels, and inadequate training for the services performed. Other factors were excessive patient volume, inadequate information, and the busy-ness of the unit, especially, the ED. Weingart, Wilson, Gibberd, and Harrison (2000) stated that the prevalence of error was not clear because of poor reporting; however, one thing that was clear from most studies is that medical treatment is not error free. All settings, specialties, patients of different ages and sexes, or health status are susceptible to the dangers of errors. The longer patients are admitted to the healthcare setting or the more complex of care patients, received, the more likely they are to become victims of errors at the hands of those providing the care. Therefore, Weingart, Wilson, and Gibberd called for changes in organizations and in the way healthcare is delivered to reduce errors (Weingart et al, 2000).

Leape et al. (2000), studied 40 hospitals with 739 tests of change. The changes include a non-punitive error reporting, documentation of allergic reaction, using chemotherapy protocols, and standardization of times to administer medication. Strong leadership, appropriate selection of intervention, efficient processes, unwavering pursuit of aims, selection of practical interventions, and immediate pursuit of change led to success in making significant changes. Teams which were successful in effecting changes focused their attention on changing processes rather than the people involved; they accepted errors to be signs of system failure rather than primarily people failure (Leape et al., 2000).

In the past when the tools of medicine were confined to the physicians' intellect, the empathy of the nurses, and a few simple surgical procedures, there were few consequences for either the lack of safety measures or for the lack of care coordination (Wachter, 2004). However, as with growth of technologically sophisticated tools, multiple caregivers, more opportunities exist for error. Given the increased risks for error, highly focused teams are necessary to deliver care (Wachter, 2004). For example, critically ill intensive care unit patients frequently require sophisticated mechanical and pharmaceutical treatments delivered by a team of competent professionals (Wachter, 2004). In these settings the effective error reduction safeguards are technology, cultural change, and procedures that are executed flawlessly (Wachter, 2004).

Wachter (2004) identified four barriers (discussed below) responsible for the inability of healthcare organizations to become free of the ever-increasing dangers in healthcare despite other progress: (a) flawed mental and collective inattention to the patient, (b) the reimbursement system and the organizational dichotomy of the United States health care, (c) progress versus safety, and (d) a fragmented organizational structure.

Flawed mental and collective inattention to patients: errors have not been examined as major system failures but rather as the failure of the individual directly associated with the error (the sharp end). The medical and nursing curricula reinforce this thinking by emphasizing individual accountability over organizational responsibility (Wachter, 2004). Most physicians and nurses perceive that they are winning the heroic high-tech battle against diseases and ailments; therefore, they believe that medical errors could be expected as the side effects of treating patients. Therefore, errors are treated lightly and finding the root causes of errors have been neglected, traditionally, by healthcare executives, policymakers, regulators, and educators (Wachter, 2004).

The reimbursement system and the organizational structures create a dichotomy in United States health care; the payment system does not encourage investment in patient safety, as Wachter asserted (Wachter, 2004); instead of being penalized for committing medical errors, in many cases, it has increased income through the per diem diagnosis-related group (DRG) reimbursement system. However, 2008 Medicare payment policy makes the first attempt to correct the perverse situation.

Progress versus safety: when priorities are established safety lags far behind productivity. It appears that the vigilance needed to ensure safety is not as valued as production or performance; therefore, safety takes a back seat to production (Wachter, 2004).

Fragmented organizational structure: traditionally, there have been two separate, parallel systems for addressing physicians and other members of the healthcare team. The presence of two parallel systems was of little concern until it became crucial that physicians participate and take leadership in safety; it was then that a separated system became identified as a problem (Wachter, 2004). However, Wachter noted that some progress has been made in form of improved safety regulations, workforce and training, error reporting systems, malpractice systems, and other forms of accountability, and information technology (Wachter, 2004).

Medical Errors

Actual numbers of medical errors remain illusive, although they create significant health risks to the public. Approximately 100 million people visit the emergency departments in the United States annually, and with that high volume a small percentage of adverse events could generate a very large number of affected patients (Kyriacou & Coben, 2000). Beyond volume in the ED, the risk (and rate) of adverse events increases because of patient acuity and limited patient health history (Kyriacou & Coben, 2000). To effectively mitigate errors in the ED, Kyriacou and Cohen (2000) suggested that research should be directed to (a) evaluating the

extent of emergency medical errors that cause considerable adverse outcomes; (b) identifying underlying causes of errors; (c) establishing interventions to reduce errors; and (d) assessing the competencies of interventions implemented to trim down or eradicate ED errors (Kyriacou & Coben, 2000).

Handler et al. (2000), gave examples of department stores as models to reduce errors in the ED. In department stores, salespersons, tags, labels, and signs aid customers in choosing the right products. The stores' designs make it difficult not to find items that customers want. Using laser price scanners allows clerks to rapidly identify items and reduce common errors inherent in manual price entry processes. Electronic verification reduces fraudulent use of credit cards or spending above credit card limits. Sensors, cameras, and security personnel throughout stores reduce thefts. Signs at the exits invite customers to register their satisfaction or dissatisfaction with the services. By improving processes, department stores can increase profit and simultaneously improve customer satisfaction (Handler et al., 2000). Using similar technologies and systems could reduce patient care errors and save about 100,000 lives each year (Handler et al., 2000).

Sexton, Tomas, and Helmreich (2000) surveyed 30,000 airline pilots (return rate = 45%), 851 operating room staff (return rate = 40 – 100%), and 182 intensive care unit staff (return rate = 59%). Sixty percent of medical staff responded that they performed effectively during critical times yet only 26% of the pilots responded similarly. About being able to dissociate themselves from personal problems and not allowing them to affect their functions on the job, 53% -59% of the pilots, anesthesia consultants, and nurses agreed. Regarding teamwork attitudes, 70% of respondents agreed that junior team members should be able to question decisions made by senior members; the breakdown in responses showed that only a bare majority (55%) of medical staff agreed, however, and 94% of pilots agreed, indicating differences in acceptance of

teamwork and flat hierarchies among healthcare staff and aviation. In the ICU, on the other hand, more than 80% of the staff reported that they felt free to ask questions about anything they did not understand, an indication that teamwork was more readily embraced in ICUs than in operating rooms (Sexton et al., 2000), probably due to a function of the types of professionals (for example, surgeons and intensivists).

Intensive care unit staff disagreed (94%) that errors committed during patient care were not important if the patients' conditions improved. About 90% favored confidential error reporting that details medical errors. About 33% of ICU staff denied committing errors and over 50% responded that the culture in their environments made it difficult for them to discuss their errors. In the ICU, about 76% stated that they did not report errors due to potential effects on personal reputation. Fear of malpractice suits prevented 71% from reporting errors. Another 68% did not report errors for fear of letting down the patients, families, and society. Fear of disciplinary action by the licensing board was a factor for 64% of the respondents. Other contributing factors were fear of job loss among 63%; 61% feared that others would perceive them as not measuring up to expectations, and 60% stated that fear of loss of ego prevented them from reporting errors (Sexton et al., 2000).

Training received by physicians in medical school and during internship promotes the spirit of competitiveness between physicians, a sense of infallibility, and feelings of having to look out for oneself (Christensen, Levinson, & Dunn, 1992). Christensen, Levinson, and Dun (1992) suggested that medical training should expose medical students and interns to the fallibility of human beings and the errors inherent in medicine. They suggested that training could be about management of certain issues and emphasizing that mistakes are inevitable. It should include how to manage feelings associated with making mistakes and how to handle mistakes when they do occur. Unwillingness to succumb to stress and its effects on performance

might be ideal for medical training but could serve as a hindrance to the prevention of errors (Sexton et al., 2000).

A quote by Nordenberg stated that curricula for healthcare workers should consider human failings. The current training that rewards health professionals for how many facts they can memorize and regurgitate is unrealistic. An example was given of the unrealistic nature of training that would give a failing grade to a medical student who confesses to not knowing an answer to a question but intends to look it up; if error is to be reduced, healthcare professionals should not be trained as super-humans, something they are not and can never be (Nordenberg, 2000).

Leape (1994) stated that nurses and physicians spend far longer time in learning and preparation in nursing and medical schools than is required in aviation. However, essential periodic testing to assess efficiency, which occurs 9-12 months in aviation, is not required in healthcare; therefore, there is no measure of the long-term effectiveness of the education received. In redesigning healthcare systems, Leape suggested the following options: (a) Make information readily available where, when, and how it is needed; (b) Standardize processes to improve efficiency and reduce errors; (c) Minimize dependency on short-term and protracted concentration, both of which are susceptible to failure when individuals encounter stress, distractions, preoccupations, and dynamic environmental situations; (d) Create safeguards to prevent errors, for example, computerized program where healthcare providers must enter patient's weight and medication allergies before any medication order is processed; and (e) Trainng of the nurses, pharmacists, and physicians to understand errors are suggestive of a system's limitations. Curricula should not only emphasize that errors are inevitable, but also teach how to avert them (Leape, 1994).

High-risk industries such as the aircraft deck operations, commercial aviation, military aviation, aerospace, and nuclear power plants have accumulated extensive experiences that allow them to use unique error management approaches (Wears & Leape, 1999). These high-risk industries have implemented techniques that place stress on the systems rather than people. They use non-punitive methods to respond to error and view errors as having many causes rather than a few. They stress inevitability of errors but instituted systems to make it difficult to commit errors; make errors transparent; and diminish the effects of errors when committed; emphasized improvement of sharp end rather than the blunt end; and stressed interactions between caregivers with the belief that teamwork could be effective in preventing errors (Wears & Leape, 1999).

Risser et al. (1999) emphasized the importance of teamwork systems as a means to advance better care to patients while reducing clinical errors. Teamwork systems foster an environment whereby healthcare team members, using the team structure, synchronize with and buttress each other to carry out clinical assignments. Although teamwork actions are not replacements for individual clinical competencies, they improve the certainty that clinical actions are synchronized and healthcare is delivered to patients, successfully, during emergency care. Teamwork gives healthcare professionals influence over dynamic workplace situations and serves as security and shields patients and healthcare professionals from the consequences of errors arising from system shortcomings and from human inadequacies (Risser et al., 1999).

In a study of 728 patients admitted to a medical intensive care unit, 232 medical errors occurred (about 32%) in 147 patients. Omission of prescribed medical treatments, needed treatment measures, and diagnostic procedures accounted for 36.5% of errors; medication errors affected 20.2%; equipment function errors accounted for 7.9 %; blood product related events comprised 2.5%; psychiatric related events comprised 2.0%; laboratory events, 1.5%; surgical errors, 1.0%; patient falls, 0.5%; and events in the miscellaneous category formed about 20.2%

(Osmon et al., 2004). The study employed a non-punitive error reporting strategy , making it possible to capture large numbers of medical errors affecting patients in the medical intensive care unit (Osmon et al., 2004).

According to Kohn et al. (2003), successful use of non-punitive error reporting systems in the ICU and ED (areas with increased medical errors) might lead to better reporting. Kohn et al. (2003) asserted that systems built to avert medical errors should have a wide range of latitude covering interpersonal communications among healthcare providers, and the ability to perform judicious checks and review of care.

Gallagher, Waterman, Ebers, Fraser, and Levinson (2003) investigated physicians (N = 46) and patient (N = 52) attitudes regarding medical error disclosure using four physician groups and three groups with a mixture physicians and patients Most indicated a desire to know everything that happened to them while under the care of their healthcare providers. Disclosing errors was considered by the patients to be a sign of respect of the patients' independence and the virtue of truth telling (Gallagher, Waterman, Ebers, Fraser, & Levinson, 2003).

Although physicians preferred to reveal errors to their patients, they feared the consequences such as, potential lawsuits, destruction of their reputations, shame and blame, and the feelings of uneasiness that might ensue. Although, physicians accept reporting errors to the patient, human character might prevents them from telling patients about errors (Gallagher et al., 2003). Physicians had varied feelings about error disclosure. Some felt disclosure might increase patients' anxiety; therefore, disclosure could do more harm than good. Other physicians believed that revealing errors might increase the bond and trust between the physicians and the patients. Still others believed that revealing errors should be selective and not everything that went wrong should be revealed to the patients (Gallagher et al., 2003).

Medication Errors

A study by Roseman and Booker (1995) identified specific types of medication errors: (a) giving medication at the wrong time; (b) omitting a scheduled medication; (c) administering a wrong dose; (d) giving medication to the wrong patient; (e) transcribing physicians' orders erroneously; (f) administering the wrong medication; (g) repeating medication without the physician's order; (h) giving medication to a patient with a known allergy to the medication; (i) discontinuing medication without a physician's order; and (j) giving medication through a wrong route (Roseman & Booker, 1995).

Environmental factors were directly and indirectly associated with increased medication errors during the winter months in Alaska. Over five years, 29% of medication errors occurred in March, 22% occurred in February, and majority (58%) of all yearly nursing medication errors occurred in winter (Roseman & Booker, 1995). During the winter months there were more than 4,000 hours of unscheduled leaves increasing nurse overtime and increased use of temporary nursing staff. Increased workload, long hours of work, increased use of temporary nursing staff, environmental situations (seasonal daylight and darkness fluctuations) might have contributed to the seasonal increase in medication errors (Roseman & Booker, 1995).

In a study by Heinemann and colleagues (1996), there were significant differences in medication errors between the experimental group (a 36-bed general surgical/trauma unit with responses from 314 patients) and the control group (a 34-bed orthopedic/trauma unit with responses from 135 patients), after adjusting for the differences in patients' hospital days. The medication errors varied from 0.001 to 0.004 for each patient day between the experimental and the control groups, respectively. This resulted in a medication error ratio between the experimental and the control units ($F = 8.067$, $p = 0.0081$). Patient falls showed a ratio variation from 0.001 to 0.005 between the experimental and the control groups, respectively, for each

patient day with a significant difference in fall ratio of $F = 3.675$, $p = 0.0374$ (Heinemann et al., 1996).

One ED participated in the National Institute for Healthcare Management study that focused on study on the system and human factors contributing to medication errors (Schmidt & Bottoni, 2003). Stategies to reduce medication errors employed were (a) intermittent checking of the medication-dispensing machine (pyxis) inventory; (b) an environment in the workplace that utilized error counseling sessions as a time to learn from the errors while not passing blame on those involved, and (c) regular in-services on medication error prevention (Schmidt & Bottoni, 2003). Fifty-eight members participated in the study, 50% of them stated they would probably report near misses, 50% would report medication errors committed by colleagues and 51% responded that there would be repercussions if they reported medication errors; a majority of the respondents felt that they would get support from their supervisors for honestly reporting errors (Schmidt & Bottoni, 2003).

Although errors are common in the ED and their occurrence is higher than in other parts of the hospital, only about 2% of all errors in the ED resulted in adverse events. The study by Fordyce et al.,(2003), cited system failure as the main factor leading to ED errors. Healthcare providers in the ED work under many constraints, including, caring for too many patients, frequent disruptions, severe time limitations, and the pressure to come up with a life saving analysis of the patients' condition with limited information. Occurrence of a high rate of errors in the ED is likely a result of system failures and not the fault of ED staff. Therefore, systems should be enhanced to make error reporting easier and non-punitive (Fordyce et al., 2003). When errors were categorized, 9% were due to administrative and other causes, 11% were environmentally related; 12% were due to failure in communication; 13% were documentation

associated; pharmaceutical related errors accounted for 16%; and 22% were related to diagnostic procedures (Fordyce et al., 2003).

Beckmann and colleagues (1996) studied the development and evaluation of an incident reporting system in three hospital ICUs; 129 questions were completed (response rate = 88%). In 2% of the reported incidents, major harm happened to the patients, with minor harm in 13%, some harm in 15%, and 85% with no harm. Some factors causing adverse incidents were faulty communication, erroneous procedural techniques, problems associated with charting, and problems recognizing alterations in patients' conditions. Patients were victims of errors were older ($p = 0.0001$) and more likely to have frequent ED visits ($p = 0.0001$); however, 98% of all errors were benign (Beckmann et al., 1996).

Donchin et al. (1995), in a prospective study of the nature and causes of human errors in the ICU identified that many errors related to faulty communication between the physicians and the nurses. In a 24-hour day, they observed 15 out of 49 patient activities. There were 3,018 activities recorded for the 15 patients in the 24-hour day. In all the activities that the researchers observed only 9% (291) involved verbal communications and of those in only 2% (60) communications occurred between the physicians and the nurses exclusively and 7% (231) exclusive communications took place among the physicians. The researchers concluded that improved communications between the nurses (who spend extended time with the patients) and the physicians (who spend intermittent time with the patients) could reduce errors (Donchin et al., 1995).

Costs of Errors

Classen, Pestotnik, Evans, Lloyd, and Burke (1997) stated that errors are common and expensive to the patients and to the organization when errors led to ADEs. Adverse events prolonged patient's hospital stay by about 1.9 days with associated increased medical expenses.

Adverse events resulted in complications for 2.4% of patients admissions, resulting in an average additional cost of about $2,262 for each patient who suffered ADEs (Classen et al., 1997).

The Harvard study of ADEs by Bates et al. (1997) corroborated the study by Classen et al. (1997) regarding the prevalence of medical errors, resulting in increased length of hospital stay and augmented costs. The study showed an increased length of stay of about 2.2 days and increased costs of about $2,595 associated with ADEs. Preventable ADEs were very expensive increasing patient costs to $4,685 and hospital stays by 4.6 days. The researchers estimated that ADEs could cost a 700 bed-hospital about $5.6 million per year.

A prospective one-year observational study of consecutive admissions (1,024) to an intensive care unit (ICU) identified 777 errors. Technical errors accounted for 2%, human errors 31%, and 67% were secondary to the patients' underlying conditions (Bracco et al., 2001). One error (0.4%) resulted in death, two (0.8%) led to worsening of the patients' disease processes, 16% resulted in no adverse events, 26% extended patients' ICU stays, and 57% caused minor adverse events. Human errors cost $985,088 (1.28 million francs) per year in extended ICU stays or other additional treatments.

Johnson and Bootman (1997), in determining the cost of ADE morbidity and mortality, requested pharmacists to estimate the possibility that a drug treatment induced an undesirable event. The researchers concluded that ADEs resulted in an additional 199,000 deaths, 3 million long-term care facility admissions, 8 million hospital admissions, 17 million visits to the EDs, and 116 million additional doctors' visits a year, leading to 76 million extra prescriptions. The total estimated cost of ADE related outcomes was calculated at $76.6 billion (Johnson & Bootman, 1997)

A retrospective study of closed ED malpractice lawsuits (N=54) from eight hospitals showed that errors could have been prevented had there been better functional teamwork (Risser

et al., 1999). Effective teamwork could reduce the cost per patient visit by $3.50, improve quality of care, and reduce the risk of litigation (Risser et al., 1999).

Costs of errors take not only a financial but also a human toll on health professionals, patients, and families (Christensen, Levinson, and Dun (1992). Physicians were apprehensive about discussing their mistakes due to fear of repercussion. However, they were able to get physicians to discuss the nature of the mistakes; physicians' personal beliefs about mistakes; emotional feelings experienced after committing mistakes, coping mechanisms employed by the physicians; and how committing the mistakes changed the physicians' practices (Christensen et al., 1992).

Mistakes mentioned by physicians included discharging patients prematurely, failure to readmit patients whose conditions deteriorated after discharge, procedures performed erroneously, lack of feelings of urgency in treating patients, and lack of adequate supervision of subordinates. Immediate factors that led to the mistakes were work overload, fatigue, pride, and preoccupation with personal problems (Christensen et al., 1992). The emotional toll on the physicians after committing mistakes lasted for days, weeks, months, or even years. The physicians stated that they felt embarrassed, afraid, guilty, and humiliated. They also experienced loss of appetite, loss of concentration, and loss of sleep. The researchers observed that there was neither a process that was supportive of physicians in assessing the root causes of mistakes nor was there a process within the system to empathize with, and care for fallible physicians. Therefore, physicians who committed mistakes were all alone with their feelings, which they suffered in secret

Mistakes committed by physicians led to some patients' deaths, preventable spread of disease (cancer), organ failure, cerebral vascular events, seizures, unintended surgery, gastrointestinal bleeding, and ICU admissions (Christensen et al., 1992).

The patients suffer as first victims and the doctors suffer as the second victims (Wu, 2000). The patients' sufferings are apparent but the physicians' sufferings might be hidden, because they do not trust the system or their peers enough to provide them a safe haven; therefore, they (second victims) suffer in secret. They blame themselves, get angry, become defensive, blame others, torment themselves over their incompatible allegiances to the patients, their organization, and the team, and worse still, they hide undiscovered errors (Wu, 2000). Wu suggested that when errors occur counseling should focus on the problem resolution strategies, finding out the causes for errors, and to examine the systemic processes and conditions that might have contributed to the errors rather than scolding those close to the errors (Wu, 2000).

Wu was amazed and disappointed at how quickly blame and shame were heaped on a resident physician following an error. Patients, hospitals, and peers often considered errors to be rare and, thus,, treat those at the point of errors (the sharp end) as culprits who deserved no mercy but shame (Wu, 2000). With such an approach, some individuals were made wholly responsible for the problems that flowed downstream to them. Responsibilities associated with those upstream (the blunt end) who should have created systems with high sensitivity for preventing errors went unaddressed. This approach deflects attention away from the causes of the errors and implementing systemic safeguards, awareness, and buffers (improvements) to reduce errors. As long as attention is diverted from root causes of errors, patients will continue to suffer at the hands of those who care for them and the blame game will continue (Wu, 2000).

The culture of blame and shame constrains healthcare from creating environments of trust, adventure, learning, executive responsibility, and systems thinking that could enhance incident prevention and reporting, and increase patient safety (Leape & Berwick, 2000). The old practice of shame, blame, and secrecy has not improved patient safety; therefore, a new approach that relies on transparency, free sharing of information, creating a blame free environment and

worker satisfaction must be considered Healthcare organizations with cultures of low expectation develop tolerance for errors; however, whenever things go seriously wrong those healthcare organizations are, without hesitation, ready to blame and punish individuals whom they perceive are responsible for the errors (O'Leary, 2000). Reversing present attitudes, behaviors, and priorities in favor of identifying the root causes and managing errors should be the focus of organizations. Accreditation requirements by The Joint Commission (TJC) on healthcare institutions have the potential to encourage organizations to take patient safety more seriously (O'Leary, 2000).

Baker and Norton (2001) enumerated three major approaches that could reduce the number of errors committed in healthcare. First, developing better information gathering mechanisms to capture the prevalence and nature of errors; however, to be successful in that endeavor, a blameless culture must replace the culture of blame and shame. Second, developing effective physician-order input and medication dispensing schemes, the costs of which, although very high, are beneficial in reducing injuries to patients and less costly compared to the costs of extra care, or awards from lawsuits filed by patients who suffered from injuries caused by adverse events; and Third, developing a culture that is sensitive to thwarting errors before they occur and that promptly interprets errors that have occurred.

Operating rooms, intensive care units, and emergency departments, the high-risk areas, need a cultural change based on the need for ongoing healthcare systems redesign and teamwork. Baker and Norton (2001) concluded that adhering to better safety practices could reduce injuries, deaths, healthcare costs,, pain and suffering, and ineffective care.

There are no universal standards for measuring errors. The yardstick for measuring errors varies from one institution to another; it is different from one discipline to another; even within the same institution, and it is different from one healthcare organization to another. Hobgood,

Peck, Gilbert, Chappell, and Zou (2002) studied differences in recognizing, revealing, and depicting errors between ED physicians (MDs), ED nurses (RNs), and emergency medical technicians (EMTs). Findings from a survey of 116 participants (convenience sample) showed that 21% of 42 MDs, 45% of 41 EMTs, and 56% of 33 RNs did not perceive that any clinical errors happened in the previous year. When errors were discovered, the providers were likely to hide them from the rest of the team (Hobgood, Peck, Gilbert, Chappell, & Zou, 2002). Lack of training in error disclosure was one hindrance to notifying patients about errors when they occurred. Another impediment highlighted as deterring EDs from achieving highly reliable safety status was lack of uniform systematic ways of recognizing, revealing, and depicting errors. Therefore, Hobgood et al. (2002) recommended that there should be provider-explicit education and improved teamwork training, and reliable error recognizing, revealing, and depicting in order to improve patient safety in the ED (Hobgood et al., 2002).

In another study investigating when and what patients (N = 258) wanted to know about medical errors, Hobgood, Peck, Gilbert, Chappell, and Zou, (2002) found the following. One percent (1%) did not want to know until they were discharged from the hospital. Twelve percent (12%) wanted to know only if the errors affected or could potentially affect their health in the future. Twenty three percent (23%) wanted to know after all the information about the errors was available; 76% wanted to be notified of any medical error; and 88% wanted to know the full scope of the error. Patients were strongly in favor of reporting errors to external agencies; 92% favored reporting errors to government agencies; 97% to the state and medical boards; and 99% favored reporting to hospital committees (Hobgood et al., 2002).

Concerning what needs to be emphasized in the training of physicians, 17% were of the opinion that physicians' training should be devoted to error detection. Twenty four percent (24%) believed that the emphasis should be on teaching physicians a way to tell patients about

errors. Thirty seven percent (37%) stated that physician training should emphasize honesty and compassion. However, none of the respondents recommended punishing student physicians for errors (Hobgood et al., 2002). Emergency department patients are often in acute stages of illness and their health history or present state of health might remain unknown to the ED staff that must attend to their health needs promptly; under those situations the potential of committing medical errors is increased (Hobgood et al., 2002).

Liang stated that patients' outcomes are results of team efforts and do not depend on the efforts of the physicians alone. Healthcare systems, therefore, should involve every staff member that has anything to do with the care of the patients. Responsibilities should be shared for whatever goes wrong and credit must be shared with the team for when things go right (Liang, 2002). When errors occur, it might be due to no fault of the health providers but a failure of the system. Liang advocated a blend of system of individual functioning and patient care thinking for higher patient care quality (Liang, 2002).

Adams and Bohan (2000) commented that rates of medical errors in the ED are unsatisfactory and measures must be taken to eradicate them. To eradicate medical errors in the ED there should be organizational leaders at each level who take patient safety seriously and who advocate for it. Adequate staffing could improve the condition of excessive patient volume and care responsibilities in order to reduce high rate of errors in the ED. However, solving high patient volume by adequate staffing alone would not eliminate the high rates of error in the ED because errors occur with low patient volume also (Adams & Bohan, 2000).

Although high patient volume in the ED is a well-recognized problem, the trend is unlikely to disappear. Hospital inpatient beds are decreasing and medical care outside hospital is rising. With these trends, more patients are using the EDs as primary care facilities. Improved medical treatment would contribute to increased longevity, resulting in an increased numbers of

elderly patients with chronic diseases requiring frequent episodic ED visits. Improved pediatric treatment has created similar trends because seriously ill children who would have died, were it not for improved medical treatments, are living with chronic illnesses, that precipitate more ED visits for treatment. In the view of Adams and Bohan, EDs should brace themselves for future increase in patient volume (Adams & Bohan, 2000).

Therefore, they suggested fixing human causes, modifying operational procedures, standardizing care, and sponsoring team coordination to decrease errors. Team coordination enables team members to understand the functions and responsibilities of other team members, which make it possible to sustain each other, communicate unambiguously, receive communication affirmatively, and establish procedures to resolve conflicts amicably. Maintaining adequate feedback among team members regarding quality of care is essential for preventing errors (Adams & Bohan, 2000).

Establishing a dependable error reporting system within the ED to make ED-focused analysis possible and to reduce threat is essential. Achieving ultimate success in reducing errors in the ED requires ongoing dedicated leaders who promote and maintain research endeavors (Adams & Bohan, 2000).

Nurses' Job Satisfaction

Rosenstein (2002), in a longitudinal study of nurses (n = 714), physicians (n = 173), and executives (n = 26) in 84 hospitals or medical groups (N= 1,200) examined opinions regarding nurse-physician relationships, physician disruptive behavior, institutional responses to physician disruptive behavior, and the effects of physician disruptive behavior on nurse job satisfaction, morale, and retention. Physician disruptive behavior means any confrontation or conflict, verbal abuse, sexual pestering, or other inappropriate behavior. Using a Likert type rating of 1 -10 (1 = least, and 10 = highest score); the mean rating was 7.51 with a standard deviation (SD) of 2.34.

In the group rating (RN group as a unit) for the variable regarding whether physicians had awareness of how important nurse-physician relationships are to nurse job satisfaction, the nurses did not perceive that the physicians had awareness of the nurse-physician relationships; therefore, the nurses gave this variable a lower rating than the physicians (MD group as a unit) did. The mean group rating was 5.12 with SD of 2.47. The nurses and the executive did not perceive that the physicians valued and respected nurses' input and collaboration (teamwork). The group mean rating was 6.15 with SD of 2.22. Nurse-physician relationships were more important to nurses and executives than they were to physicians.

About 92.5% of nurse respondents (n = 1,177) stated that they witnessed a physician using a disruptive behavior such as yelling and talking loudly; putting down colleagues, patients, disrespectful and patronizing, and using insulting language. Twenty-nine percent (319 of 1,100, 29%) of nurse respondents stated that they have witnessed such outbursts (disruptions) in about 2% to 3% of encounters. Two hundred and nineteen (219) nurse respondents (19.9%) responded that 4% to 5% of physician were disruptive, another 208 nurse respondents (18.9%) stated that 1% of medical staff displayed disruptive behavior. Nurse (308, 28%) stated that a disruptive behavior happened once or twice per month and 286 (26%) nurse respondents stated that it happened about once per week among those that shows disruptive behaviors. Nurses (n = 1,155) believe physician disruptive behavior was very serious (7.0, SD = 2.93); however, the physicians ranked the problem less serious than the nurses and the executives (Rosenstein, 2002).

The nurses and the executives (on a scale of 1 to 10 with 10 being the highest) rated physician disruptive behavior as (mean rating 8.15 SD = 2.25) having adverse effects on nurse job satisfaction and morale; however, physicians rated this lower. Nurse respondents (344, 30%, n = 1,121) stated that they knew some nurses who had left hospitals because of physician disruptive behavior. The nurse respondents stated that about 2.4 RNs left the hospital each year

and those who did not leave changed their schedules, their shifts, or department to avoid the disruptive physician.

Respondents from all groups (mean response rate was 6.49, SD was 2.78) stated that there was support to resolve conflicts between physicians and RNs in their hospital; however, nurses perceived such support less than did the physicians and the executives.

An open-ended question solicited suggestions from respondents about strategies to improve nurse-physician relationships. Nurse respondents (161 of 556, 29%) suggested increased opportunity for collaboration (teamwork) and improved communication, 133 (14%) suggested education and training of nurses and physicians on how to improve relationships, some respondents suggested open discussions (38, 6.8%), and others (37, 6.7%) suggested that nurses and physicians should take greater responsibility for their actions (Rosenstein, 2002).

Organizational Work Characteristics and Nurse Job Satisfaction

Adams and Bond (2000) found a strong correlation (N = 834) between hospital nurses' job satisfaction and organizational characteristics including cohesion among nurses, ($r = 0.51$; staff to patient ratio, ($r = 0.46$; professional practice organization in the unit, ($r = 0.46$; and collaboration with medical staff, ($r = 0.41$ ($p < 0.001$). The strong correlation between unit cohesion and job satisfaction of the nurses, according to the researchers, might have been due to the support that team members received from each other in handling stressful job or patient related issues. They also emphasized that in order for a cohesive team to develop, there needs to be adequate key stable permanent staff.

Hypothesizing that increased job dissatisfaction among South Carolina RNs might have contributed to difficulties with recruiting and retaining RNs, Ma and colleagues (2003) employed a cross sectional study 17,500 RNs (secondary data) using self-administered questionnaires with a return rate of approximately 20%. Longevity on the job increased job dissatisfaction; the longer

(more than 2 years) RNs worked in the same organization the more autonomy, recognition, and opportunities they desired. However, if the organization was unable to meet the RNs' expectations, their frustration increased and their job satisfaction decreased. About 67% of the respondents said their job satisfaction in the past two years had remained the same or declined. The new RNs (0-2 years of service) had higher job satisfaction than RNs with two or more years of service. Lack of expected autonomy, recognition, and job opportunities were associated with lower job satisfaction among the older nurses (Gallagher et al., 2003).

DiMeglio et al. (2005), using a quasi experimental, interrupted time-series design investigated effects of a team-building and collaborative process intervention on group cohesion, nurse job satisfaction, and nurse turnover. The researchers also investigated barriers to effective teamwork among nurses (N = 300). Pre-intervention response rate was 47% and 34% at post intervention period. There was a statistically significant difference between the mean score of group cohesion pre-intervention (5.5) and post intervention of 6.01 ($p < 0.001$). RN-RN interaction improved from a pre-intervention mean score of 67.80 to a post intervention mean score of 70.79. Nurses scored on the job enjoyment scale increased from a pre to post intervention mean of 51.33 to 56.58, respectively. RN-MD interaction improved from 58.07 pre-intervention to 58.55% ($p = 0.05$). Decision making improved from 47.11% to 49.14% pre to post intervention ($p = 0.05$). However, autonomy decreased significantly from 52.98% to 52.70% pre to post intervention, respectively ($p = 0.05$). There was an increase in the perception of professional practice from a pre-intervention mean score of 65.05% to a post intervention mean score of 66.20% ($p = 0.05$). Job enjoyment (happiness with job) created moderate job satisfaction with pre and post intervention mean scores of 51.33% and 56.58% ($p = 0.05$), respectively.

Nurses' turnover rates improved significantly from the pre-intervention annual rate of 9% to a post intervention rate of 6%, a decrease in turnover post intervention of 27% (DiMeglio,

Padula, Piatek, Korber, Barrett, Durcharme et al., 2005)). The intervention afforded the nurses opportunities to talk openly and thus discover ineffective and negative communication styles, differences based on age, peer aptitude, and accountability that existed among them. Nurse-nurse verbal rather than written reports were useful in improving communication, developing critical thinking skills in younger staff, and providing conditions for nurses to hold each other accountable for their actions (DiMeglio, Padula, Piatek, Korber, Barrett, Durcharme et al., 2005).

Rafferty, Ball, Aiken, and Fagin (2001), using a postal survey questionnaire for staff nurses (N = 10,022), assessed the relationship between interdisciplinary teamwork and nurse autonomy on quality of patients' care, patients' outcome, and nurses' job satisfaction. The researchers characterized the working environment in terms of nurses' autonomy, control over resources, exhaustion, decision-making, and relationship with physicians.

Findings from the study showed that the shift worked and job status (day or night shifts, part time or full time status) impacted the level of teamwork perceived by the nurses. Full time nurses scored 27% and part time nurses scored 21% on their perceptions of teamwork. Nurses who worked day shifts scored higher on their perceptions of teamwork (28%) than their counterparts who worked night shifts (16%). There was a significantly positive correlation between nurse autonomy and teamwork ($r = 0.64$, $p < 0.01$). Nurses who reported higher levels of teamwork reported higher levels of autonomy and participated more actively in decision-making. Therefore, teamwork was synergetic with autonomy rather than being in conflict with it. Thirty-one percent (31%) of the nurses that scored high on teamwork also scored high in autonomy; however, only 1% of nurses who scored low on teamwork scored high in autonomy (Rafferty et al., 2001).

Regarding the quality of care delivered, 29%, (n = 1,339) of nurses rated unit care quality as excellent; 55% (n = 2,591) as good; and 14% (n = 653) as fair, with the implementation of

teamwork. Nurses who reported higher levels of teamwork also reported significantly lower levels of burnout, higher intention to stay on their jobs, and significantly higher levels ($p < 0.001$) of job satisfaction (Rafferty et al., 2001).

In a study of nurse-physician communication styles and their effects on nurse-physician collaboration (teamwork), care quality, and nurse job satisfaction, Coeling and Cukr (2000), using a posttest design, examined 65 nurses' perceptions of nurse-physician communications. The participants categorized their perceptions of the first communication encounter of the day with physicians into one of three communication styles (dominant, contentious, or attentive styles); whether the communication demonstrated collaboration (teamwork); and what impact the communication had on care quality and nurse job satisfaction.

Dominant communication style is characterized by the communicator speaking strongly, frequently, and in a domineering manner. Contentious style is argumentative in nature, challenges others opinions, and is directed to obtain validation from others to support claims. Attentive style is characterized by communicators who speak in a calm, careful, deliberate, and emphatic manner (Coeling & Cukr, 2000).

Using or not using certain communication styles by physicians affected ($p = 0.000$) collaboration (teamwork), care quality, and nurse job satisfaction. When physicians used dominant communication styles, nurses perceived an absence of nurse-physician (teamwork) collaboration ($t = -5.42$), poor care quality ($t = -4.72$), and a decrease in nurses' job satisfaction ($t = -7.30$). When nurses felt that physicians communicated in contentious styles, the nurses' perception of nurse-physician collaboration (teamwork) suffered even more ($t = -7.50$), their perception of care quality decreased ($t = -5.92$), and their perception of their own job satisfaction decreased tremendously ($t = -9.08$). On the other hand, when the nurses felt physicians used attentive style in communicating with them, their perception of the presence of nurse-physician

(teamwork) collaboration (t= 6.13), care quality (t = 6.77), and nurse job satisfaction (t = 7.55) increased. When physicians avoided using dominant and contentious communication styles, in favor of attentive styles, when communicating with nurses, there were significant positive scores in the nurses' perception of the presence of nurse-physician collaboration (teamwork), care quality, and nurse job satisfaction (Coeling & Cukr, 2000).

Manojlovich (2005) studied the association between the practice environment and nurses' (N = 500) job satisfaction with nurse-physician communication. Structural empowerment (sources of power), factors in the nursing work environment, organizational characteristics, and nursing job satisfaction were studied. Three hundred and sixteen (316 of 500, 63.2%) usable surveys were returned. There was a highly significant association between structural empowerment and factors in the nursing work environment and RN-MD communications ($p < 0.01$). The association predicted 61% ($R2 = 0.61$) of the variance in nursing job satisfaction. Work environment factors and RN-MD communication were highly related to nurse job satisfaction. When RN-MD communication was included in the model, the variance in nurse job satisfaction increased from 52% to 61%. Improving RN-MD communication is likely one important way to improve nurse job satisfaction (Manojlovich, 2005).

Amos, Hu, and Herrick (2005) studied the impact of team-building communication training on communication and nurse job satisfaction. They performed a pretest and posttest questionnaire on scores about the effects of team-building communication training on the levels of staff communication and job satisfaction using a sample of 44 participants (RNs, nursing assistants, nursing secretaries, and monitor technicians). Team building communication training emphasized (a) recognizing communication styles; (b) managing stress; (c) understanding stages and dynamics of group developments; (d) understanding and working with different personality traits; and (e) resolving interpersonal conflicts (Amos et al., 2005).

At baseline, staff rated their own communication skills to be at 98.4% but rated other staff members' communication skills lower (93.5%). However, at the three-month posttest score, the staff rated their own communication skills at 98.9% and rated other staff members' communication skills still lower at 91.8%. After team-building communication training, constructive feedback of the staff improved by 5%. Staff and nurse managers reported progress on (a) carrying out commitments; (b) explaining barriers; (c) informing team members of progress; (d) accepting constructive feedback favorably; (e) exhibiting personal accountability; and (f) acquiring and disseminating knowledge related to the job. Staff turnover decreased significantly from 13.42% during the period pretest to 6.56% in the posttest period (Amos et al., 2005).

Upenieks (2002) compared job satisfaction differences between RNs who worked in magnet and non-magnet hospitals. The findings of the study indicated that RNs who worked in magnet hospitals were more satisfied with their jobs than their counterparts who worked in non-magnet hospitals. A two-tailed t-test analysis of quantitative data from a job-satisfaction survey questionnaire showed magnet hospital RNs had a total mean score of 143.75 compared with non-magnet hospital RNs with a total mean score of 125.33, a significant difference at $p < 0.001$ and t-test value of 6.02. Factors which made magnet hospitals more conducive to nurses' job satisfaction were organizational job characteristics such as adequate staffing, autonomous climate, participatory leadership (management), and collaborative teamwork (Upenieks, 2002).

Group-Cohesion and Nurses' Job Satisfaction

Kovner, Brewer, Wu, Cheng, and Suzuki (2006), using a cross-sectional design mailed questionnaire to 4,000 RNs in twenty-nine states in the United States, studied factors that predicted RNs' job satisfaction. The response rate was 40% (1,907) out of which 80.65% (1,538) were completed and analyzed. Various work attitudes such as work-group cohesion, autonomy,

promotional opportunities, work and family conflicts, supervisor support, variety of work, degree of compensation in relation to performance, and organizational constraints accounted for more than 40% of the variance in RNs job satisfaction. Work-group cohesion alone accounted for 8.3% ($p < 0.01$) of the variance in nurse job satisfaction (Kovner et al., 2006).

A non-randomized, predictive design using a survey of RNs ($N = 90$) measured effects of nurse attitudes, environment of care, and composition of care on job satisfaction and nurses' intent to leave (Larrabee et al., 2003). According to the survey findings, one of the major predictors of job satisfaction was psychological empowerment. Nurses' hardiness, transformational leadership style of managers, nurse/physician collaboration, and cohesion were predictors of nurse psychological empowerment. The major predictor of intent to stay at the job was job satisfaction; however, low control over practice predicted 25.6% variance in intent to change jobs ($p < 0.0001$). High RN job satisfaction and support system availability accounted for 26% of intent to stay on the job. Nurses who were satisfied with their influence on their department were 1.8 times less likely to want to change jobs than those with less influence (Larrabee et al., 2003).

Leppa (1996) studied 908 RNs in four hospitals to determine the association between interpersonal relationships and job satisfaction work group disruption and RN satisfaction with interpersonal relationships among work group disruption and RN perceptions of patient safety and quality of care. Satisfaction with interpersonal relationships was indicative of work group cohesion. Nurses in units with higher absenteeism reported more use of agency nurses and lower job satisfaction ($r = -0.23$; $p = 0.05$). There was a positive association between nurse/nurse interaction and patient safety ($r = 0.30$; $p = 0.01$) and quality of patient care ($r = 0.37$; $p = 0.01$).

The participants reported that they perceived decreased patient safety or care quality ($r = -0.25$ and $r = -023$; $p = 0.01$) because of disruption brought about by absenteeism and the

use of agency nurses. Personnel changes such as new hires, transfers, or terminations did not have a significant association with work group cohesion (Leppa, 1996).

Shader, et al. (2001), using a cross-sectional design and self-reported questionnaire, surveyed RNs and RN managers (N = 246) regarding job satisfaction, team cohesion, perceived job stress, and expected turnover. The study demonstrated strong association among stress, team cohesion, job satisfaction, and intent to leave the job. Pearson's correlation coefficient at $p < 0.001$ showed that when job stress was high ($r = -0.41$); cohesion in the team decreased; nurse job satisfaction decreased ($r = 0.51$); and nurses intent to leave the job increased ($r = 0.37$. There was a positive correlation between group cohesion and job satisfaction and a reduced interest by the nurses to quit their jobs (Shader et al., 2001).

Garrett and McDaniel used a cross-sectional exploratory design and self-administered questionnaire to examine impact of environmental uncertainty and social climate on nurse (N = 287) burnout.(Garrett & McDaniel, 2001). Units having high environmental uncertainty, based on admissions, discharges, and patient transfers, within the month, had a high mean score of 1.31 (Burnout scale 1-5), and units with lower perception of environmental uncertainty scored lower (0.62).

Multiple regression showed that the participants who responded that there was inadequate supervisor support ($r = -0.33$, $p < 0.01$); lack of personal involvement in the unit activities ($r = -0.31$, $p = 0.02$); and lack of unit certainty there was increased emotional exhaustion. Participants not involved in the activities of the unit ($r = -0.60$, $p <0.01$) and where there was inadequate supervisor support ($r = -0.25$; $p = 0.04$) there were increased feelings of depersonalization. Participants who considered environmental uncertainty positively ($r = 0.35$, $p <0.01$) perceived less emotional exhaustion and less depersonalization ($r = 0.26$ p0.01). Also, participants who felt strong peer cohesion ($r = 0.34$, $p = 0.01$) and involvements in unit activities

(r = 0.36, 0.03) also perceived less depersonalization and more personal accomplishments. The findings from the study highlighted the importance of social networks as a buffer against burnout during times of change and uncertainty, showing that a supportive work environment could protect burnout (Garrett & McDaniel, 2001).

Bratt, Broome, Kelber, and Lostocco (2000) examined the influence of stress and nursing leadership on nurses' job satisfaction, using a cross-sectional design (N = 1973) staff nurses. Variables measured were job stress, nurse leadership behavior, nurses' perception of group-cohesion, nurse-physician collaboration (teamwork), professional job satisfaction, and organizational job satisfaction.

There were significant negative associations (r = -0.37 to r = -0.56) among job stress, group-cohesion, professional job satisfaction, nurse-physician collaboration (teamwork), and organizational work satisfaction. There was a positive correlation among organizational work satisfaction (r = 0.35 to r = 0.56), group cohesion, professional job satisfaction, and nurse-physician collaboration or teamwork (Bratt et al., 2000). Group-cohesion, job satisfaction, nursing leadership behaviors, and nurse-physician collaboration (teamwork) accounted for 52% of the variance in organizational work satisfaction (Bratt et al., 2000).

Adams and Bond (2000), showed positive correlations between job satisfaction and cohesion among nurses (r = 0.51), and job satisfaction and collaboration with medical staff (r = 0.41). The study findings emphasized the importance of professional teamwork among the nurses as well as professional teamwork between the nurses and the medical staff. The researchers stated that wherever organizational environments induce good communication between the staff, patients are likely to reap the benefits (Adams & Bond, 2000).

Physicians' Job Satisfaction

Rondeau and Francescutti (2005), using a survey of Canadian ED physicians (N = 1434), with a 29.8% return rate, research found a strong negative association between physician job satisfaction and self-reported shortage of resources ($p < 0.01$), including nursing shortages ($p < 0.01$), availability of ED and institutional beds ($p < 0.01$), availability of medical specialists ($p < 0.05$), and hospital technology and support staff ($p < 0.05$. Existence of ED nurses ($p < 0.01$), ED beds ($p < 0.01$), and hospital beds ($p < 0.05$) contributed significantly to ED physician job satisfaction (Rondeau & Francescutti, 2005).

Self expression, extrinsic factors, and helping others motivated academic physicians (N = 480) at a time that physicians were generally not satisfied with their jobs (Wright & Beasley, 2004). The researchers investigated differences in job factors that motivated clinician educators (87; 60%) and clinician investigators (51; 35%); 37% of the total participants were female.

Clinician investigators (clinicians who conduct research but are not teachers) scored higher on motivation, on a five point Likert-type questionnaire, than clinician educators (clinicians who are teachers but do not perform research). The clinician investigators had higher motivation as demonstrated by their ability for self-expression (4.30 vs. 3.84; $p < 0.001$). Female physicians were more motivated than their male counterparts in helping other staff or team members (4.18 vs. 3.89; $p = 0.03$). Fifty-seven percent of the respondents stated they would gladly accept their position again and 56% would recommend a position like theirs to others, demonstrating moderate job satisfaction. The researchers concluded that there were significant differences in factors that motivated clinician educators and clinician investigators (Wright & Beasley, 2004).

Researches characterized sources of physician job satisfaction, job related stress, and attrition of emergency department physicians, using a mail survey of randomly selected

American Board of Emergency (ABEM) physicians (N = 1,317). There were 768 (58.4%) usable responses (Doan-Wiggins, Zun, Cooper, Meyers, & Chen, 1995). Job satisfaction among most resident trained (RT) and the primary care (PC) physicians were related to their practice. Factors (twelve examined) in physician job satisfaction, with high mean ranking of between 7 and 12, were working relationships, various practice opportunities, professional respect, and prestige. Respondents (PC group) (186 of 737) 25.2%) felt burnt out with their job as did 25.4% of (187 of 737) 25.4% in the RT group (Doan-Wiggins et al., 1995). About 292 of the RT group and 456 of the PC group planned to leave emergency medicine. The physicians who planned to stop practice reported higher burnout ($p = 0.001$) and lower mean score of job satisfaction ($p = 0.0001$).

Landon et al. (2003) studied factors responsible for decreasing trends in primary care and specialist physicians' job satisfaction between 1997 and 2001. Most of the decline in job satisfaction occurred between 1997 and 1999. In 1997, 42.4% of the primary care physicians and 43.3% of the specialists were very satisfied. However, in 2001, only 38.5% of primary care and 41.4% of specialist physicians were very satisfied with their job. According to the study, it was not declining income but threats to physician autonomy, time, and high-quality care that were strongly associated with decreasing job satisfaction. The level of dissatisfied specialists increased from 12.9% to 14.8% between 1977 and 1999 (Landon et al., 2003).

Using a cross-sectional design to assess physicians' job satisfaction, dissatisfaction, and turnover. a random sample of 5,704 physicians participated in a mail survey. Generalists and specialists reported similar job satisfaction levels; however, older physicians reported greater job satisfaction than their younger counterparts. About 27% of the physicians intended to quit their job within two years (Pathman et al., 2002).

Physicians reported dissatisfaction with some aspects of their job had greater propensities to quit within two to five years than those with median levels of job satisfaction. Generalists who were not satisfied with their community relationships (OR, 2.26; $p < 0.0001$), and non-physician staff relationships in their offices (OR, 1.59; $p < 0.01$), were more likely to intend to quit than those with higher scores (OR, 0.60; $p < 0.01$) (Pathman et al., 2002).

Williams et al. (2003) examined ten values that physicians (N = 2,325) associate with an ideal job such as connection with the community (72%); long-term relationships with patients (85%); recognition of the importance of their job (87%); autonomy in making decisions (93%); compatible physician coworker (97%); and good relationships with staff (98%). The important value-added conditional aspects of physicians' ideal work pertained to relationships with physician colleagues (97%) and non-physician coworkers (98%). Some work values commonly considered important for ideal work conditions by most of the physicians that contributed to job satisfaction were interpersonal relationships, autonomy, and resource access (Williams et al., 2003).

Staff Stress Level and Job Satisfaction

Simoens, Scott, and Sibbald (2006) examined the impact of job satisfaction of general practitioners (GPs) and work-related stress on physician retention, turnover, and patient satisfaction with care, using a mailed survey sent to randomly selected GP principals (physicians who belong to the physician partnership) (n = 1,000), GP non-principals (n = 359), and personal medical services (PMS, n = 62). On a seven-point Likert-type questionnaire, the GP PMS (personal medical service) were most satisfied with their job (total mean score of 4.85), followed by the GP non-principals (4.56), and GP principals (4.06 total mean score). Variables that gave the GPs most satisfaction were relationships with colleagues and fellow workers, level of

diversity in the job, and quantity of responsibility. The GP principal (3.46) and GP non-principals (3.76) were less satisfied with remunerations than the GP PMS (4.97).

Increased workload, increased paperwork, inadequate time to complete the job properly, and heightened and unrealistic expectations from patients were factors increasing job stress. About 33% of the GP principals indicated their intention to decrease the number of hours they work within five years. The following percentage of the GPs intended to leave their present general practice within two years, GP principals 11%; PMS GPs 14%; and GP non-principals 38% (Simoens et al., 2006).

Descriptive study using self-administered questionnaire sent to 593 New Zealand (NZ) physicians and 795 United Kingdom (UK) physicians (Grant, 2004) showed that physicians in UK were more likely to think about quitting their job because of stress than NZ physicians. United Kingdom physicians and surgeons felt less autonomy in matters pertaining to their jobs than NZ physicians and surgeons.

The study showed a significant correlation between job satisfaction and reactions to job stresses in NZ and UK. Feeling unable to remain skilled at work correlated with low job satisfaction and increased stress ($r = -0.32$; -0.34). Bureaucratic interference (job setting/environment) correlated with in low job satisfaction and increased stress ($r = -0.35$; -0.40) respectively). Disinterest in work because of job stresses correlated with low job satisfaction and increased stress ($r = -0.22$; -0.26).

In a study to determine factors associated with physicians' plans to leave practice, Williams et al. (2001) studied physicians ($N = 171,000$) who were active clinically, using a mail-in survey questionnaire of 5,704 physicians, resulting in 2,325 usable responses ($n = 2,325$). Among four variables investigated as potential factors associated with physicians' plans to leave their practice were job satisfaction/dissatisfaction and job stress.

The mean job satisfaction score was 3.67 (a 5-point scale), indicating that the physicians were moderately satisfied with their jobs; however, 21% of the respondents scored less than 3, evidence that some physicians were not satisfied. Most physicians experienced a low stress level (mean score 2.39 on a 5 point scale). However, about 25.1% of the respondents reported a high level of stress (Williams et al., 2001).

Some physicians (25.4%) considered quitting their present job within two years and 40.3% intended to reduce their work hours within five years. Few physicians (3.1%) had the intention of changing their specialties and other physicians (18.5%) expressed the probability of quitting direct care of patients (Williams et al., 2001).

Researchers also noted that dissatisfaction and distress were associated with some physicians' intention to quit their job, reduce work hours, quit direct patient care, or remain in the same specialty (E. S. Williams et al., 2001).

In studying burnout and its correlates in emergency physicians, Goldberg et al, (1996) examined evidence of burnout in the responses of 1,272 physicians. Of the 33 variables examined, ten significantly predicted 29% of the variance in burnout ($p < 0.0001$). Four factors, which accounted for about 25% of the variance in burnout, were (a) thought of experiencing burnout (13.54%), (b) level of job involvement (8%), (c) level of productivity and effectiveness (2%), and (d) satisfaction with career (1.51%). Other variables (factors) such as satisfaction with services of subspecialty (0.82%) and continuous practice of emergency medicine over 10 years (0.6%) were associated with physician job satisfaction (Goldberg et al., 1996).

Patients' Satisfaction with Care in the ED

Hospital administrations have put major emphasis on patient satisfaction. About 50% of patients' admissions to the hospital come through the ED, which makes the ED a high profile area. Therefore, patients' satisfaction with their care in the ED could have a profound effect on

hospital satisfaction ratings. The ED has always received poor performance ratings on patient satisfaction surveys. The chaotic nature of emergency medicine and patients' perception of a long wait before care contributed to the patients rating of the emergency department poorly (DeBehnke & Decker, 2002).

One way patients' satisfaction with their care in the ED could be improved is to identify patients' perceptions of their care, form interdisciplinary teams to address problems, and execute a planned solution that involves every employee (Batrich & Domerchie, 1995; Hedges, Trout, & Magnusson, 2002; Taylor, Wolfe, & Cameron, 2002). A patient-centered Primary Provider Theory of Patient Satisfaction, using randomly selected samples of emergency department patients, tested the association between physician service, waiting time, and patients' satisfaction with care (Aragon & Gesell, 2003). Physician service accounted for 48% and waiting time explained 41% of patients' satisfaction with care. Nurses' job satisfaction may affect quality of care they provide, which may result in increased patient satisfaction. In this study nurses' job satisfaction accounted for 11% of patients' satisfaction.

When physician service satisfaction increased by one unit, patients' satisfaction with waiting time, nursing service, and overall satisfaction increased by 0.999, 0.844, and 1.031 respectively. Increase of one unit in waiting time satisfaction was associated with increases in patients' satisfaction in nursing service by 0.417 and in overall patients' satisfaction by 0.685. An increase in patients' satisfaction with nursing service by one unit increased overall patients' satisfaction by 0.221. Therefore, patients' satisfaction with care received in the ED was related to (a) their expectations of the service provided by the primary provider, (b) how long they waited for the primary provider, and (c) the services provided by the nurses (Aragon & Gesell, 2003).

Mayer, Cates, Matorovich, and Royalty (1998) studied effects of customer-oriented training on patient satisfaction in a level one ED (62,000 ED annual visits). They analyzed

patients' complaints, compliments, and quality of services received by the patients, pre and post customer-oriented training. There was a decrease in complaints by 76.92% post customer-oriented training, which represented a reduction from 2.6 complaints per 1000 to 0.6 per 1000 visits. As patients' complaints decreased, patients' compliments increased from 1.1 per 1000 to 2.3 per 1000 ED visits, a 109.09% increase post customer-oriented training. All categories of service received by patients increased, as evidenced by increased patient satisfaction with ED physician expertise and ED nurse efficiency: increased probability of the person return to the same ED for service, and increased overall satisfaction with service received.

The researchers suggested, based on their findings, that clinically customer-oriented training could improve quality of service provided to patients, increase patient satisfaction, prevernt lawsuit, and thus provide a competitive edge in the healthcare market (Mayer, Cates, Mastorovich, & Royalty, 1998).

A non-experimental, descriptive, correlational study (N = 28) by Bruce et al. (1998), examined factors that affected patient satisfaction with care received in the ED. The major factors examined were caring and compassion, staff competency, communication, and concern for patients and families. Findings showed that when patients were very satisfied with nursing care. Seventy-five percent (75%) of patients gave caring and compassion the highest satisfaction ratings, 74% rated medication and treatment similarly, and 71% gave communication about care the highest rating. Nineteen percent (19%) gave a lower satisfaction rating about concern shown to those accompanying the patients, 11% were not satisfied with communication received about care, and 11% were not pleased with the monitoring which patients received in the ED (Bruce et al., 1998).

Hall and Press (1996), using a random sample of patients (N = 9,106) from 23 EDs, studied factors that affected patient satisfaction in the ED. Independent variables studied were

nursing and staff items, physician issues, waiting time, convenience issues, and care given (tests and treatments). Nursing staff and care issues (t = 22.9) had highest predictive value for patient satisfaction. The predictive value of physician issues and waiting time/convenience issues were also important for patient satisfaction (t = 16.26). When staff explained processing time and delays, patient satisfaction with care in the ED increased.

Heinemann, Lengacher, VanCott, Mabe, and Swymer (1996) compared experimental and control nursing units to evaluate the effects of partnering with other staff on patient satisfaction, patient falls, intravenous (IV) infection, and medication errors. Data were collected at the pre, interim, and the posttest stages. In RN-partnering, the nurse coordinated the activities of the healthcare team (RN and her/his subordinates). There was a significant difference in patient satisfaction in the experimental units versus the control units ($p = 0.0003$). There were also significant differences in patients' perception of timeliness of their needs being met ($F = 9.832$, $p = 0.0019$).

The use of RN-partnering in patient care appeared to have had significant impact on patients having a positive perception of the care they received. Medication errors and patient falls were lower in the experimental units than in the control units also (Heinemann et al., 1996).

Raper (1996) studied 397 randomly selected patients, using telephone interviews and found that patients' satisfactions with ED nursing care correlated positively with patient perception of their own improvement. Patients' satisfaction with ED nursing care was not related to patient's acuity, presence of chronic diseases, sources of payment, frequency of previous ED visits, treatment type, length of stay, age, marital status, or gender. Patients' satisfaction with ED nursing correlated positively with psychological security and information disseminated to the patient ($R2 = 0.72$, $p = 0.0000$). Patients' intention (86%, 171/200

respondents) to return to the same ED correlated positively with patient's satisfaction with the ED nursing care ($r = 0.5705$, $p < 0.001$).

Rhee and Bird (1996) examined the effects of patients' perceptions ($N = 618$) on their satisfaction with ED care, using a telephone questionnaire. Variables examined were overall service, nurse technical functioning, physician technical functioning, nurse bedside behavior, physician bedside behavior, registration clerk service, and patient behavioral intention. Results showed a positive correlation between patients' satisfaction and intention to recommend the ED. There was also a significant positive association ($n = 603$) between overall satisfaction and nurse technical functioning ($t = 5.38$, $p < 0.001$); physician technical functioning ($t = 5.33$, $p < 0.001$); clerk service ($t = 4.02$, $p < 0.001$); and time ($t = 2.83$, $p = 0.005$). Neither nurse ($t = 1.28$, $p = 0.20$) bedside behavior nor physician ($t = 0.365$, $p = 0.72$) bedside behavior had any significant association with overall patient satisfaction. Patients' perceptions of the nurse and physician technical skills weighed more heavily in their satisfaction with ED care than timeliness or bedside behavior (Rhee & Bird, 1996).

Boudreaux et al. (2000) studied the effect of patient perception, visitation features demographics, and willingness to recommend the ED in determining patient satisfaction with care in the ED. Patient perceptions of staff care, their safety, and their understanding of discharge instructions ($t = 0.365$, $p = 0.72$), perception of wait time for the physician, and nurses' technical skills best predicted ($p < 0.05$) patient satisfaction. Patients who presented to the ED with more serious health conditions were more satisfied than were those with less serious health problems. Older patients were to be more satisfied with the care they received in the ED and were more likely to recommend ED service to others than younger patients (Bourdreaux, Ary, Mandry, & McCarbe, 2000).

Taylor and colleagues (2002) analyzed ED patient complaints in a retrospective study from 36 EDs over 61 months to determine needed changes in the ED treatment processes. They examined 3,418 complaints of which 33.4% (N = 1,141) were associated with patient treatment; 31.6% (N = 1,079) were associated with inadequate communication, and 11.9% (407 complaints) were related to delays in treatment.

Poor communication was the second source of patient dissatisfaction with ED care. The researchers concluded that about 33% of complaints were related to medical treatment, 33% were related to inadequate communications. The finding that about 33% of the complaints were resolved by improved communication supported this assertion. Emergency departments had a complaint rate of 2.7 per 1000 related to ED process (Taylor et al., 2002).

To distinguish medical center units with exceptionally high patient complaints: Pichert et al. (1999) conducted a seven-year retrospective study of patient complaints (N=15,631). Most frequent negative perceptions of care were environmental cleanliness or safety 7%; accessibility of staff 9%; staff humanity traits 13%; service cost collection process 20%; communication 22%; and medical management of care 29%.

The findings also showed complaints related to hospital in-patient units were highest at 21.34% (2,696 complaints) followed by the ED at 18.48% (2,335 complaints). The researchers remarked that satisfying patients and families who present to the ED under very difficult conditions is a monumental task and that might account for high frequency of patient complaints' related to ED care (Pichert et al., 1999).

Larrabee, Ostrow, Withrow, Janney, Hobbs, and Burant (2004) used a predictive non-experimental survey questionnaire to investigate the effects of nurse job satisfaction, context of care, structure of care, patient-perceived nurse caring, and nurse-physician collaboration (teamwork) on patients' satisfaction with care. Nurse-physician collaboration (teamwork)

showed a weak but significant association with patients' satisfaction. The researchers remarked that the positive association between patients' satisfaction and nurse-physician collaboration (teamwork) should encourage hospital management to enhance nurse-physician (teamwork) collaboration (Larrabee et al., 2004).

Summary of the Literature

This survey of the literature reviewed the research, and some related literature, regarding teamwork practices related to hospitals, emergency departments, and airline and military practices. The literature reviewed has shown some known facts; however, some facts that are not yet known will be examined by this study.

Known Facts

Medical and Medication Errors

Teamwork has been shown to improve working relationships, improve safety, and reduce errors in aviation and in the armed forces. Healthcare settings, like aviation and the armed forces, perform tasks that require diverse responsibilities, a high level of judgment, complex decision-making, and accountability for outcomes (J. Barrett, Morey, Risser, & Salisbury, 2001; Sexton et al., 2000) and could benefit from effective teamwork practice.

Stress and Job Satisfaction

Reduced job stress, increased group cohesion and positive interpersonal relationship between the nurses and physicians were factors that contributed to job satisfaction of nurses and physicians . Those factors have led to reduction in burnout as well as turnover, especially, for the nurses (Anderson, 1996; Shader et al., 2001).

Patient Satisfaction

Stress and dissatisfaction among physicians adversely affect the quality of healthcare service they render (Bratt et al., 2000; Khuwaja et al., 2004). Teamwork has been shown to

reduce duplication of efforts and increase patient satisfaction with care (Amos et al., 2005; Aragon & Gesell, 2003; Bruce et al., 1998; Coeling & Cukr, 2000; DiMeglio, Padula, Piatek, Korber, Barrett, Ducharme et al., 2005; Ernst, Messmer, Franco, & Gonzalez, 2004; Hall, 1996; Heinemann et al., 1996; Kovner et al., 2006; Manojlovich & Laschinger, 2002; Mayer et al., 1998; Pichert et al., 1999; Raper, 1996; Rosenstein, 2002; Taylor et al., 2002).

Effective Teamwork Practice

The military and commercial aviation have been pace setters in the practice of teamwork (Brannick, Prince, Prince, & Salas, 1995b; Risser et al., 1999; Salas, Burke, Bowers, & Wilson, 2001; Salas & Cannon-Bowers, 2001; Salas et al., 1992). In those industries, hierarchical status has been reduced and teamwork has been emphasized. Mental health, rehabilitation, intensive care, and geriatric units have all adopted some form of teamwork to meet patient needs that could not be met by individuals or separate groups working alone. Many emergency departments practice what seems to be teamwork; for example, during emergent events such as resuscitations, ED staff come together to form an ad hoc team to handle the crisis. However, such teams disappear until another crisis appears. The reason the teams do not stay together is because there is no perceived need by the unit for support and training to practice and sustain teamwork.

Teamwork Training

Make teamwork operational in the ED, Morey et al, 2002, developed and implemented teamwork-training curriculum (ETCC) to address circumstances in the ED. This was the first major training to make teamwork operational in the ED by teaching strategies to maintain team structure and climate, solve problems, maintain team communication, carry out plans, manage workload, and improve team skills. Three evaluations (one pre and two posttests) were conducted to determine the effectiveness of teamwork training on staff attitudes and behavior and patient outcomes. However, there has not been a comparative evaluation of differences

between EDs that participated in ETCC and are actively practicing teamwork principles and those EDs that neither participated nor practice its principles.

Unknown to be examined by this Study

This study will examine differences between EDs that participated in ETCC and are currently using teamwork principles and those that did not participate in ETCC and are not practicing teamwork principles. The following variables will be examinined to determine any significant differences between the interventional group and control group on staff's (nurse's and physician's), (1) perception of nurse-physician teamwork; (2) staff job satisfaction; (3) staff perception of work environment; (4)staff perception of autonomy; (5) staff perception of control over practice; (6) staff perception of job stress; (7) patient perception of satisfaction with care; and (8) medical and non-medical errors.

CHAPTER THREE

Conceptual Framework of Donabedian's Structure-Process-Outcome of Quality Care

The theoretical framework to be used to direct the study is Donabedian's structure-process-outcome model of quality care. Donabedian's theory proposed that health care structures affect processes of care and processes of care influence patient outcomes. According to the theory, the three components are linked to form the three parts of quality assessment (Donabedian, 1966, 1988). Donabedian contended that good structures increase the possibility of good processes and good processes produce good outcomes (Figure 1).

Donabedian proposed three measures (structure, process, and outcomes) to assess the quality of patient care in healthcare settings. Structure represents attributes of the setting. Process represents healthcare activities and the manner in which they are performed. Outcomes are the result or the effects that healthcare activities have on patients' health status and/or satisfaction (Donabedian, 1966, 1980, 1982, 1988, 1992).

Structure

Attributes of the setting where care takes place are part of the structure of care and such items as the number and qualifications of staff (human resources); facilities, equipment, and finances (material resources); clear delineation of responsibilities; commitment; and stressors (Donabedian, 1966, 1980, 1982, 1988, 1992). Structure, also, includes personnel characteristics of workers such as age, gender, training, experiences, knowledge, skill, longevity, beliefs, attitudes, incentives, and job satisfaction. Patients' characteristics are also parts of the structure of care, and those characteristics manifest themselves in patients' age, gender, diagnosis, health conditions, severity of illness, health habits, preferences, and co-morbidities (Donabedian, 1966, 1980, 1982, 1988, 1992; Kelly, Huber, Johnson, McCloskey, & Maas, 1994; Tarlov et al., 1989).

Process

Processes include the activities performed in giving and receiving care. Patients and health care personnel participate in the process of healthcare. The activities of the patients include seeking health care and implementing the plan recommended by the health care personnel. The health care personnel, through their interpersonal relations with the patients and with other healthcare personnel glean important information which is useful in diagnosing and recommending a patient care regimen (Donabedian, 1966, 1980, 1982, 1988, 1992). The technical level of care deals with diagnoses and interventions, whereas the interpersonal level of care deals with relationships as manifested in the quality and manner of communication (Donabedian, 1966, 1980, 1982, 1988, 1992; Kelly et al., 1994).

Outcome

Outcome is the manifestation of the effects of activities performed on health conditions of the patients or communities. Outcomes are measured by how much patients' or communities' health conditions, knowledge, and satisfaction improve (Donabedian, 1966, 1980, 1982, 1988, 1992). Tarlov et al., 1989). Included in outcomes are the measures of socio-physical and role functioning in daily living; clinical conclusiveness; patients' feelings about their health and well-being, in general; and their satisfaction or dissatisfaction with care.

The relationship between structure and process is essential to enhance the relationship between process and outcome. Good structure improves the chance of a good process, and so does a good process increase the propensities of good outcomes. Two of the best measurements of quality, according to Donabedian, are patients' satisfaction and dissatisfaction with aspects of care, and especially, with relation between nurses and physicians (Donabedian, 1966, 1980, 1982, 1988, 1992).

Relating Structure to Process:

Structure, an antecedent to process, can exert a negative or a positive influence on the process of care. The quality of the staff, availability and adequacy of human resources, material resources, and adequate staff mix can influence how effectively care processes are performed. Organizational culture, manner of peer review, policies, and procedures of the organizational setting can enhance or deter the processes of care. Age, gender, training, beliefs, attitudes, experience, knowledge, skills, longevity, incentives and job satisfaction of the staff can also impact the process of care (Kelly et al., 1994).

Relating Structure to Outcome:

Structure, process, and outcome function together in a continuum. Structure acts as antecedent to process, and process serves as an antecedent to outcome. If the structure of the organization produces positive influences on process, the processes of care are enhanced toward positive outcomes for the patients and communities (Kelly et al., 1994).

Relating Process to Outcome:

Donabedian proposed two elements in practitioner performances, of technical and interpersonal elements. Technical styles of care deal with the manner in which treatments are administered, including provider skills, knowledge, continuity, and coordination of care (Donabedian, 1966, 1980, 1982, 1988, 1992; Tarlov et al., 1989). Knowledge and judgment are essential to determine the strategies and the skills necessary to implement them. Adequate implementation of technical performance results in improved patient health status proportional to the effectiveness by which they are carried out (Donabedian, 1988). Donabedian asserted that judgment of quality of care should not be based only on patient outcome, as long as the performance rendered was in compliance with the norm of practice to achieve the best outcome at the time the care is given (Donabedian, 1988). In continuity of care, patients get their care

from the same provider(s), regardless of which provider(s) the patients see; the primary health care provider(s) for the patients are aware of the treatments through provider to provider communications (Tarlov et al., 1989).

Interpersonal relationships are pivotal to the flow of information between patients and health care personnel (Donabedian, 1966, 1980, 1982, 1988, 1992; Tarlov et al., 1989). Interpersonal relationships flourish in an atmosphere of friendliness, honesty, tact, empathy, concern, courtesy, respect, informed choice, privacy, confidentiality, and sensitivity (Donabedian, 1988). In such an environment, patients are likely to participate in decision-making and share in responsibilities for care. Clinicians are apt to counsel patients regarding their health behaviors, their importance of complying with treatment plans, dealing with personal and emotional difficulties, and improving level of communication (Tarlov et al., 1989).

Through interpersonal relationships between health care personnel, the spirit of interdependence is enhanced and the flow and quality of communication for the benefit of patients occurs. As health care providers interact with each other, they realize their interdependence. The realization of interdependence can lead to better communication, better collaboration, and enhanced teamwork among the health care personnel (Kelly et al., 1994).

Philosophy

Critical Theory

Critical social theory strives for critical insight into relationships of power and it attempts to uncover the constraints that interfere with free and equal participation in society (Grams & Christ, 1992). The primary goal of critical theory is to facilitate liberation from social, political, and economic constraints. Even within the political context of higher education, nursing has had less power to influence decisions. The survival game continues as long as the oppressed accept it as the game they want to play and believe that there is no alternative. However, critical theory

suggests that there could be movement away from oppression by choice of decisions and actions that consciously move towards liberation. According to critical theory, change could and would occur if actions were taken to shift power relationships (Grams & Christ, 1992).

Marginalization is seen in political struggles of women, people of color, immigrants, the mentally ill, sexual minorities, children, the poor, and victims of violence. Marginalization is a form of oppression based on maintenance of boundaries that keep power for a limited portion of the population. Critical theory believes that marginalized people should act collectively to break their bound (Hall, 1999).

Feminist Theory

According to Hall and Stevens (1991), Feminism shares the following three basic principles: (a) valuing of women and a validation of women's experiences, ideas, and needs; (b) recognition of existence of ideological, structural, and interpersonal conditions that oppress women; and (c) a desire to bring about social change to oppressive constraints through evaluation, education, and political action.

Feminism is committed to ending the domination of any group over other groups but favors changes within the society. Feminist thinking is based on lived experience of oppression, lack of individual political freedom and power, the dynamic of oppression, and analysis of how it works. Feminism advocates personal power and personal freedom; it is the freedom that applies equally to everyone whereby no one group gains power over others (Chinn, 1989). The power switch within the nursing profession, whereby nurses are empowered to greater equality, involves development of the following dimensions: (a) raising the consciousness of socio-political realities, (b) increasing nurses' self esteem, and (c) promoting political skills to negotiate and change the healthcare system (Mason et al., 1991). According to Mason et al. (1991), the plight of nursing could be strengthened by two assumptions: (a) nurses individually

and collectively have more potential power than is currently obvious, and (b) nurses increased political awareness and skills are necessary to bring about changes in healthcare. The fundamental principle of Feminist theory is based on power sharing and not on power grabbing and in preventing one group from wielding power over others. However, nurses must be realistic that the problems they face are embedded in the system in which they work and those problems cannot be eradicated by the nurses' own actions alone (Mason et al., 1991).

Research Questions and Hypotheses

This dissertation intends to investigate the following questions, hypotheses, or variables regarding (a) the effect of educational training on the nurse-physician perception and practice of teamwork in the ED; (b) the impact of nurse-physician teamwork on medical errors; (c) the impact of nurse-physician teamwork on medication errors; (d) the impact of nurse-physician teamwork on nurse job satisfaction; (e) the impact of nurse-physician teamwork on physician job satisfaction; (f) the impact of nurse-physician teamwork on staff job stress; and (g) the impact of nurse-physician teamwork on patient satisfaction with care.

Research Question 1: Are there differences in staff perception of RN-MD teamwork by staff who work in the interventional group EDs compared with staff who work in the control group EDs?

Test of Hypothesis 1: Staff perception of RN-MD teamwork by staff who worked in interventional group will be significantly higher than those who worked in the control group EDs.

Research Question 2: Are there differences in staff perception of job satisfaction by staff who work in the interventional group EDs compared with staff who work in the control group EDs?

Test of Hypothesis 2: Staff job satisfaction score will be significantly higher in staff who work in the interventional group than those in the control group EDs.

Research Question 3: Are there differences in staff perception of work environment by staff who work in the interventional group EDs compared with staff who work in the control group EDs?

Test of Hypothesis 3: Staff perception of work environment (score) in staff who worked in the interventional group will be significantly higher than in staff who worked in the control group EDs.

Research Question 4: Are there differences in staff perception of autonomy by staff who work in the interventional group EDs compared with staff who work in the control group EDs?

Test of Hypothesis 4: Staff perception of autonomy will be significantly higher (score) in staff who worked in the interventional group than those in the control group EDs.

Research Question 5: Are there differences in staff perception of control over practice by staff who work in the interventional group EDs compared with staff who work in the control group EDs?

Test of Hypothesis 5: There will be a significantly higher perception (score) of control over practice by staff in the interventional group than in those in the control group EDs.

Research Question 6: Are there differences in staff perception of job stress by staff who work in the interventional group EDs compared with staff who work in the control group EDs?

Test of Hypothesis 6: There will be a significantly lower perception (score) of job stress experienced by the staff who work in the interventional group EDs than of those who work in the control group EDs.

Research Question 7: Are there differences in staff perception of satisfaction with care by patients who receive their cares in the interventional group EDs compared with patients who receive their care in the control group EDs?

Test of Hypothesis 7: There will be a significantly higher perception (score) of satisfaction with care expressed by patients who receive their care in the interventional group EDs than by those who receive their care in the control group EDs.

Research Question 8: Are there differences in the number of occurrences of medical and non-medical errors experienced by patients who receive their cares in the interventional group EDs compared with patients who receive their care in the control group EDs?

Test of Hypothesis 8: There will be a significantly lower number of occurrences of medical (safety) and non-medical errors experienced by patients who receive their care from the interventional group than those who receive their care in the control group EDs.

Assumptions

The following assumptions were considered for the study:

Assumption 1: Emergency departments are stressful for nurses, physicians, and patients; therefore, there is a need for teamwork.

Assumption 2: Participants, if provided with informed consent, will answer as truthfully as possible.

Assumption 3: Physicians and nurses may perceive that they are practicing teamwork simply because they work together.

Assumption 4: The nursing discipline and medical discipline may each perceive its role as lesser or more important in healthcare; therefore, there may be no teamwork.

CHAPTER FOUR

Methodology and Procedure

Research Design

This dissertation research proposal is a comparative analysis of the effects of teamwork education on staff, including registered nurses (RNs) and physicians (MDs), and the patients in the emergency department (EDs). Data will be collected from hospitals that are actively using the training from an Emergency Team Coordination Course (ETCC) versus hospital EDs that have not participated in the ETCC course. The ETCC course was initially evaluated in a prospective multi-center quasi-experimental study conducted by Morey and colleagues from May 1998 to March 1999 (Morey, Simon, Jay, Wears, Salisbury et al., 2002). The EDs subjects are continuing to actively use the training principles actively.

Emergency Team Coordination Course (ETCC) was an adaptation of aviation-oriented teamwork curriculum to train staff in the EDs who face similar life and death circumstances just as in aviation. The training addressed the following five team dimensions: maintaining team structure and climate; applying problem solving strategies; communicating with the team, executing plans and managing workload; and improving team skills. The effectiveness of the training (ETCC) was determined by assessing three outcome variables: Team Behaviors; Attitudes and Opinions; and ED performance.

Nine hospital EDs participated in the initial training with six EDs comprising the experimental group and three EDs comprising the control group. Inclusion criteria in the study was an agreement by each ED to minimize physical changes to their facility, staffing levels, and administrators during the twelve-month-long study (May 1998 to March 1999). The participants in each ED were the nurses, physicians, technicians, and unit clerks (the unit clerks were optional). Physician-Nurse pairs formed the instructors for the training in each participating ED.

The training was given to mixed groups of physicians, nurses and technicians. The behavioral orientation emphasized in the training were process of teamwork and the specific coordination that must occur between the caregivers as an effective team.

Procedure with Emergency Departments

Sample

On behalf of the student researcher, Dr. Morey will seek the participation of EDs in California that participated and are still practicing teamwork principles provided in the ETCC training given by Morey and colleagues (2002). The student researcher will contact four EDs in California with at least 25 nurses and 25 physicians in each of four EDs comprising the experimental group and four other EDs, in California, with at least 25 nurses and 25 physicians in each of four EDs comprising the control group. The selected EDs in the experimental and the control groups will be matched, as closely as possible, concerning demographic-geographical location, type of ownership, University affiliation, number of beds, for-profit or not-for-profit status, and trauma level status. Emergency department demographic data to be collected are the average number of patients served per year, trauma levels (level 1, 2, or 3 trauma center ED), and demographics of the geographical location served. From four EDs that agree to participate in the study, a convenience sample of at least 25 nurses and 25 physicians from each of four EDs will comprise the interventional group and a convenience sample of at least 25 nurses and 25 physicians from each of four other EDs will comprise the control group.

Once an agreement is achieved with each of the eight participating hospitals, the student researcher will obtain Institutional Review Board (IRB) approval from the IRB of the University of California, Los Angeles and from the IRBs or appropriate consenting bodies of all participating hospital EDs. The student researcher will get individual informed consents from the hospital ED staff and patients prior to involving them in the study.

Sampling and Data Collection Methods

Power Analysis

With an effect size of 0.4 for the difference between the means of the two independent groups (experimental and control) and 80% power ($p = 0.05$), the estimated sample size needed is 100 participants per group. Since four hospital EDs will be recruited for each group, the researcher will be collecting data on at least 25 participants (25 registered nurses and 25 physicians) per hospital ED.

Procedure with Participants

Staff Participants

The staff participants will be a convenience sample of nurses and physicians from all shifts of each of the four interventional hospital EDs and from all shifts of each of the four control hospital EDs. All RNs and MDs will be invited to participate and to complete survey questionnaires. The purpose of the survey will be communicated to the participants and an opportunity will be given to them to participate or to refuse to participate. Refusal to return the survey package will constitute refusal to participate. The sample inclusion criteria consist of: (1) staff has worked in the ED for at least six months; (2) staff has worked as a full time or a part-time Registered Nurse or Physician in the ED. Those not meeting the criteria will be excluded. There will be informational meetings to inform the staff before the start of the study and to address their concerns (Appendix 1). Each participating hospital will be assigned an identification number and the information matching the identification number will be kept in a lock and key box and maintained in the custody of the student researcher.

The staff demographic data to be collected include age, gender, educational level, ethnicity, employment status, and longevity of employment in the hospital. The survey questionnaires will be given to the staff. The participants will be encouraged to return the

questionnaires. The researcher or his assistants will be present on each shift and the participants will return the questionnaires to them and then pick a $10.00 gift certificate to one of a number of local stores or movie theatres as a thank you token for participation.

Patient Participants

Patients who visit the EDs during the study will be surveyed. The sample inclusion criteria consists of: (1) being a patient in the ED; (2) being at least 18 years of age; or (3) being under 18 years of age and parent or guardian of the patient being physically present and consenting to participate. Those not meeting the criteria will be excluded. The researcher or research assistants will set up a survey station at the ED exit area to survey patients or patients' parent or guardian at the end of their visits. Patient acceptance, completion, and returning completed questionnaire will constitute consent to participate. Refusal to accept the questionnaire will constitute refusal to participate. The purpose of the survey will be explained to the subject in either English or Spanish (Appendices 2 & 2a). Participants will complete a written questionnaire either in English or in Spanish and return questionnaire to the researcher or research assistant before leaving. At least one of the research assistants will be Spanish speaking. Data will be collected in each participating ED from Monday to Sunday for a period of 24 hours each day in order to include all shifts, until 100 or more are completed.

Instruments and Questionnaires)

The instrument used to assess the effect of teamwork on staff job satisfaction was the Revised Nurse Work Index (NWI-R), (Kramer & Hafner, 1989; Aiken et al., 1994). Psychometric information about NWI-R was described by Aiken and Patrician and reliability was estimated using Cronbach's alpha which equaled 0.96 for the entire NWI-R; the aggregated subscale alphas ranged from 0.84 to 0.91. The original instrument demonstrated validity by its ability to differentiate nurses who worked within a professional practice environment from those

who did not, and its capacity to predict differences in nurse burnout (Aiken & Patrician, 2000). When revised to measure physician job satisfaction, every word "nurse" was changed to "physician" and every word referring to "nursing" was changed to "medical." (Appendix 3a)

The Healthcare Team Vitality Instrument (HTVI) was used to measure staff perceptions of the work environment. This ten-item instrument was developed as a part of a national program of Robert Wood Johnson Foundation and the Institute for Healthcare Improvement called Transforming Care at the Bedside (Lee, B, & Upenieks, V. 2007).

The Healthcare Team Vitality Instrument (HTVI) is a short 5–point Likert-type survey measure (response options ranging from 1-5) with 1 being strongly disagree and 5 being strongly agree. This instrument has been used in inpatient hospital settings such as medical-surgical units. It measures front-line staff perception of team vitality, empowerment and engagement, effective communication, team collaboration, and work environment supportive of safe and high quality patient care. Construct validity of scale (extent to which HTVI measures the variables that it is intended to measure) was demonstrated by co-efficient of ≥ 0.90 with a reliability of 0.80 - 0.90. This instrument not only measures the characteristics of the staff and their perceptions of the characteristics of the organization where they work, but also critical factors of interdisciplinary team functioning (Upenieks et al., 2009) (Appendix 3b).

Staff Job Stress (Job Stress Instrument) by Hinshaw and Atwood (1983).

The Job Stress Instrument (JSI), a 49-item job stress instrument, will be used to measure staff's perception of stress in their job and job environment. The instrument contains a Likert-type scale ranging from1 (almost always) to 4 (rarely). Sample questions are "I am able to cope with job stress," "Adequate relief is provided for lunch, coffee breaks," and "My judgment is respected by physicians." In previous research, a two-week test-retest stability ranged from r = 0.52 – 0.68, discriminant validity constant with predictions, and satisfactory construct validity as

an estimation of predictive modeling ($p \leq 0.05$). Factor analysis resulted in average loading of 0.69. A moderate internal consistency estimate on the four subscales of job stress related to team respect, competence, feelings of competence, and time priorities showed coefficient alphas of the instrument ranging from 0.69 to 0.75. Job stress demonstrates moderate to strong reliability and construct validity estimates (Appendices 3c & 3d).

Patient Satisfaction Survey (Quality of Care Survey) (QCS) (Morey et al. (2002)

Patient satisfaction survey (QCS), a 12-item survey instrument, will be used to measure patients' satisfaction with care received in the ED (Appendix N). Two of the items in the survey will be used to measure patients' overall satisfaction with ED care and their willingness to recommend the ED to others. The instrument contains a Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). Sample statements are "My caregivers knew what other caregivers had done for me." That question addresses perception of staff communication, which is a central theme of teamwork. This instrument was developed for a study entitled "Error reduction and performance improvement in the emergency department through formal teamwork training: Evaluation results of MedTeams Project" (Morey, Simon, Jay, Wears, Salisbury et al., 2002). The items in the survey instrument were developed so that the ED patients' responses addressed specific teamwork behaviors (Morey, Simon, Jay, Wears, Salisbury et al., 2002) (Appendices 3d & 3e).

Medical Error Reporting (SAFE Reporting Tool and Quality Assurance Record)

The SAFE reporting tool will be used to collect data on medical and medication errors in the EDs (Appendix O). The patient-safety study groups at Washington University and Barnes-Jewish Hospitals developed the SAFE reporting tool based on feedback from clinical interviews and focus groups in critical care (Osmon et al., 2004). Each letter of the acronym, SAFE stands for an operational behavior. S stands for safety; A stands for action; F stands for focus; and E

stands for everyone. It could be summarized to mean everyone is focused on actions to promote safety.

The SAFE tool is a simple instrument and it was designed to assess basic information and to activate appropriate follow-up actions as needed, and to be less time consuming than more detailed survey. It could be used anonymously, which is its strongest attribute (Osmon et al., 2004).The useful element of the SAFE tool was in recognizing and reporting events to be analyzed in order to modify practice and improve patient outcomes. The tool is in the form of a reporting card with two sides. The information items to be collected, on side one, in the original form are patient's name, medical record number, date of reporting, date of error event occurrence, time of occurrence, location of occurrence, type of event, summary of the event, and action taken. Information needed on side two is whether the risk management events form was completed, status of the person reporting the event, and classification of harm scale.

The first pilot study of the SAFE program was conducted in the medical intensive care unit of Barnes-Jewish Hospital was successful. However, based on the feedback from the pilot study, certain modifications were made to the tool (Osmon et al., 2004).

After the modifications, the SAFE tool was introduced to three intensive care units, the emergency department, and the recovery department with successful results. Therefore, the SAFE reporting tool is not limited to critical care areas, but could be used in any patient care department (Osmon et al., 2004). However, for this study, the demographic information regarding the patient, the staff reporting, and the location of the incident has been removed for compliance with health insurance portability and accountability act (HIPAA) and patient health information (PHI) laws and to increase the likelihood that the staff will use the form. The two pages have been combined to one page without sacrificing the information on the original form. Experts in nursing and medicine will examine the instrument for content, face validity, and

provide their findings regarding structure and wording of the items to be sure that they capture all pertinent information in error reporting, thus establishing the validity and reliability of the instrument

The SAFE tool will be placed in a dispenser in the staff locker-room, nursing office, nurses' and physicians' lounges, conference rooms, and nursing stations of the hospital EDs participating in the study, for ease of the staff to access it for use in reporting errors as they occur. There will be locked boxes conveniently located and clearly marked where completed SAFE tools will be deposited. Data will be collected using SAFE tool for a period of 30 days during the study (Appendix 3g).

Quality assurance (QA) event-reports during the period of the study will be reviewed, if available, and data will be collected from the review using the SAFE tool format. Error collection using QA will coincide with the period of the study when data are being collected, also using the SAFE tool. Error or adverse drug event (ADE) data collected from the quality assurance record will be identified as such. The aggregate information or the number of incidents, without identifiers, will be shared if the hospital requests it after the study.

Statistical Method and Analysis.

Test of Hypothesis 1: Staff perception of RN-MD teamwork by staff who worked in interventional group will be significantly higher than those who worked in the control group EDs.

Test of Hypothesis 2: Staff job satisfaction score will be significantly higher in staff who worked in the interventional group than those in the control group EDs.

Test of Hypothesis 3: Staff perception of work environment (score) in staff who worked in the interventional group will be significantly higher than in staff who worked in the control group EDs.

Test of Hypothesis 4: Staff perception of autonomy will be significantly higher (score) in staff who worked in the interventional group than those in the control group EDs.

Test of Hypothesis 5: There will be a significantly higher perception (score) of Control over Practice by staff in the interventional group than in those in the control group EDs.

Test of Hypothesis 6: There will be a significantly lower perception (score) of job stress experienced by the staff who work in the interventional group EDs than of those who work in the control group EDs.

Test of Hypothesis 7: There will be a significantly higher perception (score) of satisfaction with care expressed by patients who receive their care in the interventional group EDs than by those who recveive their care in the control group EDs.

Test of Hypothesis 8: There will be a significantly lower number of medical (safety) and non-medical errors experienced by patients who receive their care from the interventional group than those who receive their care in the control group EDs.

Data will be analyzed on SAS statistical package using descriptive statistics, one-sided t-test to test statistically significant differences between the interventional hospital EDs and the controls.

Descriptive statistics will be used to describe the basic characteristics of the data in the study. Descriptive statistics, in combination with simple graphic analysis, describe the data. It will provide simple summaries about the samples and the measures. The sample characteristics of the patients, the staff, and the organizations that will be described are age, gender, ethnic group, educational level, income levels, severity of illness and disposition after care, employment status, longevity, number of patients served per year, ED trauma status level, and geographical location served.

There will be four hospital EDs in the interventional and four in the control groups. The t-test will be used to assess whether the means of the two groups are statistically different from each other on each variable. It is hypothesized that there will be statistically significant differences in teamwork perception, nurses' job satisfaction, physicians' job satisfaction, physician and nurse stress levels, patients' satisfaction with care, and increased patient safety (reduced medical and medication errors) between the interventional and the control groups.

One-sided t-tests will be used to assess whether the means of the two groups are statistically different. . The values between the two groups (interventional and control groups) must match one-to-one. It is anticipated that there will be statistically significant differences between the interventional and the control groups in nurse-physician teamwork, staff job satisfaction, work environment, autonomy, control over practice, job stress, patient satisfaction with care; and (8) the occurrence of medical and non-medical errors.

Teamwork perception, nurses' job satisfaction, physicians' job satisfaction, staff stress levels, patients' satisfaction with care, and increased patient safety (reduced medical and medication errors) between the experimental and the control groups. However, in order to use this test the sample sizes between the two groups must match one-to-one (Agresti & Finlay, 1999; Bland & Altman, 1996).

Limitation of the Study

There are certain limitations related to this study. The populations' demographics will match those of the EDs, which might give the study a high level of internal validity; however, it might differ from the population as a whole. First, it is the intent of this study to assess patient and staff outcomes. Self-perceptions of teamwork, nurse-physician teamwork, staff job satisfaction, work environment, autonomy, control over practice, job stress, patient satisfaction with care; and (8) the occurrence of medical and non-medical errors.

job stress, job satisfaction, and patient satisfaction with care are influenced by variations in the perceptions and opinions of individual participants and might not be solely a result of specific actions.

Second, the participants will complete the survey questionnaire at a single point in time (cross-sectional study) and since there might be fluctuations in the levels of stress, job satisfaction, or patient satisfaction with care for any individual, the effects of the factor might create bias of the findings.

Third, the study will be done on a convenience sample of patients and families who visited EDs for care to determine medical and medication errors, which might significantly bias the findings towards institutional-specific cultures. Another problem with using SAFE to gather data on errors might be either over-reporting or under-reporting errors. The problem with under-reporting could result in perceived false improvement in patient safety. On the other hand, over-reporting might create a false sense of lack of patient safety. Under both conditions, the reliability and generalizability of the results could be in question. Fourth, the participants might not answer all of the questions, which could subject the results of the study to systematic bias in response and thus compromise ability to generalize the results.

Patients that are admitted directly from the ED might not have opportunity to participate in the study as the patients or their family members might not leave the ED through the normal exit where the study is set up. This might create selection bias and might make generalizing the result of the study less reliable.

Although the interventional EDs have undergone ETCC training and are currently practicing teamwork, there might be variations on the level of how teamwork is being practiced. This uncertainty might affect the reliability of the result of the study.

The participants in the interventional EDs might have answered similar research questions during ETCC training and, as result, might be familiar with correct answers to the questions. . This could create a Hawthorne Effect and might render the result of the research unreliable.

Publications

The student researcher will share the design, literature review, and results of the study by means of publications and presentations at research conferences and to clinicians. Journals under consideration to receive the manuscripts and the topics are identified here.

(a). Conceptual Framework Paper

- Topic: "A review of the Literature on Outcomes related to Teamwork among Nurses and Physicians."
    - Journal: *Journal of Advanced Nursing:* This journal is known for its efforts to publish findings and theories that underlie nursing research.
    - Journal: Journal of Nursing *Quality:* This journal is devoted to disseminating theoretical frameworks associated with standards of quality.

(b). Data-based Paper

- Topic: "Effect of Nurse-Physician Teamwork Practice on Emergency Department Nurses' and Physicians' Perceptions of Teamwork and Nurse-Physician Job Satisfaction: A Comparative Study."
    - Journal: *Health Care Management Review:* This journal is focused on reviewing implications and direction of research related to management.

- Journal: *Journal of Nursing Administration:* This journal publishes research articles dealing with healthcare organization issues and their implications for patient care quality and nursing administration.
- Journal: *Academy of Emergency Medicine:* This journal focuses on publishing articles on patient care issues in the emergency department.
- Journal: Emergency Nursing Journal: This journal publishes articles dealing with emergency nursing.
- Joint Commission Journal: This journal deals with compliance and safety issues.

(c). Data based Outcome Paper:

- Topic: "Nurse-Physician Teamwork in the Emergency Department and its Impact on Perceptions of Work Environment, Autonomy, and Control over Practice: A Comparative Study."
- Journal: *Journal Health Services Research:* This journal focuses on publishing innovative methodology in research and its impact on patient outcomes.
- Journal: *Journal of Nursing Administration:* This journal publishes review articles dealing with healthcare organization issues and their implications for patient care quality.
- Journal: *Academy of Emergency Medicine:* This journal focuses on publishing articles on patient care issues in the emergency department.
- Journal: *Emergency Nursing Journal*: This journal publishes articles dealing with emergency nursing studies.

CHAPTER FIVE

Summary of the Result

This dissertation will address a comparative evaluation of differences between EDs that participated in ETCC and are actively practicing teamwork principles and the EDs that neither participated nor practice its principles. The intent of the study is to determine the impact of ETCC on the effective practice of teamwork in the ED.

The descriptive aim of this study is to assess differences between the interventional group and control group on the following dimensions: 1) nurses' perceptions of nurse-physician teamwork and 2) physicians' perceptions of nurse-physician teamwork. The exploratory aim of this study is to: assess staff outcomes as measured by (a) nurses' job satisfaction, (b) physicians' job satisfaction, (c) staff perception of their work environment, (d) autonomy, and (e) control over practice.

This chapter presents findings from the data collected from eight emergency departments throughout Northern and Southern California. The following are the findings from the test of the research hypotheses:

Hypothesis 1 tested true ($p = 0.006$). Staff perception of RN-MD teamwork by staff who worked in the interventional group was significantly higher than among those who worked in the control group EDs.

Hypothesis 2 tested true ($p < 0.0001$). The staff job satisfaction score was significantly higher among staff who worked in the interventional group than those in the control group EDs.

Hypothesis 3 tested true ($p = 0.0006$). Staff perception of the work environment (score) among staff who worked in the interventional group was significantly higher than among staff who worked in the control group EDs.

Hypothesis 4 tested true ($p < 0.0001$). Staff perception of autonomy was significantly higher (score) among staff who worked in the interventional group than among those who worked in the control group EDs.

Hypotheses 5 tested true ($p < 0.0001$). There was a significantly higher perception (score) of Control over Practice by staff who worked in the interventional group than in those who worked in the control group EDs.

Hypothersis 6 tested false: There was no significant difference in perception (score) of job stress experienced by the staff who worked in the interventional group EDs and of those who work in the control group EDs.

Hypothesis 7 tested false: There was no significant difference in perception (score) of satisfaction with care expressed by patients who received their care in the interventional group EDs and those who received their care in the control group EDs.

Hypothesis 8 was not tested: There was inability to receive approval from the participating sites to collect data on the variables (medical and non-medical errors).

Two sample, one-sided t-test analysis, using The Statistical Analysis Systems (SAS) program, release 9.2 (Cary, NC) was utilized.

The following three papers report the background, methodology, results, discussion, limitations, and conclusion of this research.

Paper One

A Review of the Literature on Outcomes related to Teamwork among Nurses and Physicians

Introduction

Teamwork is the sharing of a common purpose and responsibility among healthcare professional members where each member (nurse and physician) clearly understands and values

his/her function and the functions of other members. Baker stated that "teamwork" is required to have safer healthcare and that it is an essential ingredient in a majority of clinical settings where rigid status hierarchies are still present and impediments to teamwork remain (G. R. Baker & Norton, 2001).

Background

Even though teamwork in health care has a long history, it is still in its infancy because enthusiasm for its adoption has been limited. The Dawson Report in 1920 introduced the concept of teamwork. The report proposed that general practitioners (physicians) from health centers ought to work in multidisciplinary teams (Services, 1920). However; the idea of teamwork remained undeveloped until the Gillie Report of 1963, which recommended that community nurses be associated with groups of practicing physicians (Council, 1963). Midwives contributed to teamwork by working together with obstetricians and gynecologists in order to combine the care of the infant and the mother. Enthusiasm for teamwork in health care was revitalized in the 1980s when Federal documents argued that the most efficient way to deliver health care was through teamwork (Department of Helath and Social Security, 1981; Department of Health and Social Security, 1986; Welsh, 1987). In 1991, in London, the Queen's Nursing Institute report, entitled *Quality Through Teamwork*, depicted teamwork as the best approach to deliver complete and high quality health care (Institute, 1991). Although those claims were unsupported by research studies (Poulton & West, 1993), they served as the basis for empirical studies of teamwork. Although some early studies have shown the existence of multidisciplinary teams in primary health care, they did not provide evaluations of the outcomes of intra-professional teamwork. (Bond et al., 1985; Gilmore et al., 1974; McIntosh & Dingwall, 1978).

Teamwork could improve working relationships between nurses and physicians and thus significantly improve their job satisfaction. In a hugely competitive healthcare market, it could be a motivator and a good job retention strategy for both physicians and nurses, if an organization were to put emphasis on job satisfaction. It seems likely that when nurses and physicians are satisfied with their jobs, they are more likely to perform at their optimal level in caring for the patients (Khuwaja et al., 2004).

Purpose

The purpose of this literature review is to reveal research findings on the association of teamwork and nurse job satisfaction, physician job satisfaction, patient outcomes and satisfaction with care. It is also to show implications and directions for future teamwork research.

Method

The four basic steps used in this narrative review were article compilation, assortment, abstraction, and literature review. To obtain good compilation of articles, bibliographic databases were searched and key reference sections of articles were reviewed. In performing article searches, Google; Medline; Inbox; Cinahl; Mozila Firefox; Google Chrome; Internet Explorer, and PubMed.gov were used. The searches produced a robust number of articles because the terms physician job satisfaction, nurse job satisfaction, nurse-physician teamwork, and patient satisfaction with care were included in the search subject headings. Reference lists of vital journal articles were also examined to locate articles that might have been missed in the bibliographic database searches. This process produced additional articles not previously discovered through database searches. While a majority of the articles were from the United States, several were from Great Britain, a socialized government-provided healthcare system.

Teamwork was viewed as the independent variable which accounted for the outcomes. Articles selected for inclusion were based on four criteria. First, the articles were required to discuss teamwork or some characteristics of nurse and physician teamwork (strategies to maintain team structure and climate, solve problems, maintain team communication, carry out plans, manage workload, and improve team skills). Second, the study hypotheses were required to include teamwork or its characteristics as an independent variable. Third, data on relationships between teamwork (independent variable) and outcomes were presented either empirically in the text or in tables. Fourth, the articles were required to be peer reviewed. Vital information from each article was extracted and entered into a database. Information collected included sample size, response rate, type of instruments and reliability, analytical techniques (means comparison, correlation, regression, percentages, and Chi-square). The eighteen articles reviewed in this study were divided into three outcome groups: nurse outcomes, physician outcomes, and patient outcomes with summaries of the information collected.(Appendix 3h).

Findings in the Literature Review

Nurse Outcomes

Some major associated outcomes of effective practice of teamwork, as shown by research studies, are depicted in this review. Teamwork has been shown to influence staff cohesion, effective staff communication, trust and respect among staff, reduced burnout, increased job enjoyment, to increased feelings of camaraderie, intent to stay on the job, and overall staff job satisfaction (Appendix 3h).

Kalisch, Lee, and Rochman performed a cross-sectional study to demonstrate an association of teamwork, unit characteristics, and staff characteristics and job satisfaction ($N = 3,675$). When participants highly rated both teamwork and the staffing level in their unit ($p < 0.001$), they also rated their job satisfaction higher ($p < 0.05$) (Kalisch et al., 2010). Another

investigator found that structural empowerment and factors in the nurses' work environment with nurse-physician communications predicted 61% variance in nurse job satisfaction. Work environment factors and nurse-physician communication highly predicted nurse job satisfaction (Manojlovich, 2005).

A group of researchers at The North Carolina Center for Nursing studied the effects of team-building training (N = 44) on communication and job satisfaction pre and post training. While there were no significant differences in communication level ($p > 0.05$) and in the job satisfaction score ($p = 0.96$) in the-three month posttest period, long term advantages of team-building training were evident in an improvement of team environment from 75.6% to 80.8%, an increase of 5.2%. Also, there was an increase in constructive feedback by 5% after team-building communication training. There were also improvements in interpersonal interactions, and staff turnover decreased from 13.42% pretest to 6.56%, posttest ((Amos et al., 2005).

One of the elements of teamwork is improvement in communication which includes sending and receiving of intended information. Coeling and Cukr examined three styles of communication: the dominant, contentious, and attentive styles. When physicians used dominant styles, it was perceived by the nurses as a breakdown or absence of collaboration (teamwork) between the nurses and the physicians ($t = -5.42$, $p = .000$). They also perceived decreased patient care quality ($t = -4.72$, $p = .000$); and decreased job satisfaction ($t = -7.30$, $p = .000$). In the same manner, when physicians used contentious communication, the nurses felt that there was no nurse-physician collaboration ($t = -7.50$, $p = .000$) and they associated the situation with poor care quality ($t = -5.92$, $p = .000$); and low nurse job satisfaction ($t = -9.08$, $p = 0.00$). On the other hand, when physicians used an attentive style, the nurses perceived the presence of collaboration (teamwork) ($t = 6.13$, $p = .000$); care quality ($t = 6.77$, $p = .000$); and nurse job

satisfaction (t = 7.55, p = .000) ((Coeling & Cukr, 2000). Therefore, in any organization where teamwork is effective, the outcomes for the nurses, and patients could be positive.

In an English survey study (N = 10,022), researchers categorized characteristics of the work environment into nurse autonomy, control over resources, relationship with physicians, emotional exhaustion, and decision making dimensions. In this study, teamwork correlated with nurse job satisfaction. Nurses who reported higher perceptions of teamwork also reported higher levels of job satisfaction; they had lower burnout, and intended to stay in their jobs (p = 001). There was a high correlation between teamwork and autonomy ($r = 0.64$, $p < 0.01$). Nurses with higher levels of autonomy were more likely to relate well with team members and to be involved in decision making (Rafferty et al., 2001).

In a unit-nursing team interventional study, Adams and Bond found that cohesion among nurses predicted 51% of the variance in nurse job satisfaction. It was also evident that a stable staff was necessary to maintain group-cohesion and teamwork. Group cohesion enhanced the nurses' interests in assisting colleagues to handle stressful patient issues (Adams and Bond, 2000). An introduction of a unit-based team-building strategy was associated with improved group-cohesion (N = 300), with an increase in mean scores from 5.5 pretest to 6.01 posttest (scale of 1-10), (p = < .001). After the introduction of the unit-based team building, there were significant improvements in nurse-nurse interaction, nurse-physician interaction, and decision making score ($p < 0.05$); turnover decreased from 9% to 6%, and perception of professional practice increased significantly ($p < 0.05$) (DiMeglio, Padula, Piatek, Korber, Barrett, Ducharme et al., 2005).

A study by Shader et al. demonstrated that increased job stress was negatively associated with team cohesion ($r = -0.41$); decreased nurse job satisfaction ($r = 0.51$); increased nurse intent to leave the job ($r = 0.37$); and decreases in nurses' intent to stay on the job ($r = -$

0.47) (Shader et al., 2001). Another investigator demonstrated that there was a significant negative association (r = -0.37 to r = -0.56) between job stress and group-cohesion, professional job satisfaction, nurse-physician collaboration (teamwork), and organizational work satisfaction. There was also a significant positive correlation between organizational work satisfaction (r = 0.35) and group cohesion (r = 0.56) ((Bratt et al., 2000; Ernst et al., 2004).

The nine articles reviewed above demonstrated an association between adequate staffing and the practice of effective teamwork. They also demonstrated that effective teamwork could improve nurse-physician relationships, feelings of group-cohesion, staff assistance to each other, autonomy, and staff job satisfaction and decrease stress levels, burnout, and turnover. In addition, the studies showed that teamwork and autonomy are not contrary to each other but are synergistic.

Physician Outcomes

Physicians are a major sector of staff in any healthcare setting whose relationship with other healthcare members, especially with the nurses, could have a tremendous impact on job satisfaction of physicians. Baggs et al. assessed and compared levels of nurse-physician collaboration (teamwork) and satisfaction with the process of decision making and effects of satisfaction on nurse retention. The nurses and physicians reported moderate amounts of RN-MD collaboration at the sites except for the attending physicians from the surgical intensive care unit (SICU). A majority of the physicians were more satisfied with decision-making process than the nurses from all sites (Baggs et al., 1999).

Resident physicians and nurses were organized into unit-based care teams in an attempt to increase face to face communication, the ability of care team members to know each other, feelings that patient care needs were being met, and decreasing the number of pages to the resident physicians. Resident physicians (n = 60) and pediatric ward nurses (n = 154)

participated in the study. Data collection occurred during three periods: pre-intervention, early post-intervention and late post-intervention periods. In the post unit-based team intervention periods, resident physician initiated face to face communication and nurse initiated face to face communication improved ($p = .002$). The resident physicians were able to recognize the nurses caring for the patients in their team ($p = .05$). There was also significantly improved perception by resident physicians that patient care needs were being met ($p = .009$). In addition, the number of pages to the resident physicians decreased significantly by 42% ($p = .001$) (Gordon *et al.*, 2011).

Williams et al. examined ten values, which physicians ($N = 2,325$) associated with positive contributions to their job satisfaction. The values examined were: connection with the community (72%); long-term relationships with patients (85%); recognition of the importance of their job (87%); autonomy in making decisions (93%); compatible physician coworkers (97%); and good relationships with staff (98%). The researchers found that most important value-added conditional aspects of physicians' ideal work pertained to relationships with physician colleagues (97%) and relationships with non-physician coworkers (98%). Other work conditions that contributed to job satisfaction for physicians were interpersonal relationships, autonomy, and resource access (Williams et al. (2003).

In the above articles, the work environment, including interpersonal relationships among the members of the healthcare team, their autonomy, turnover, and other work factors were shown to be related to job satisfaction. The research demonstrated some teamwork attributes such as professional respect, effective communication, and good interpersonal, professional relationships could lead to job satisfaction and retention (Appendix 4). .

Patient Outcomes Competition between healthcare organizations, increased knowledge by the patients, and improved technology have increased pressure on healthcare organizations to

be patient-focused in delivery of care. Therefore, healthcare organizations have devised several processes to improve patient satisfaction with care, among which is teamwork. The potential for satisfied staff to give high quality patient care is high (Ernst et al. 2004), and the practice of teamwork has been shown to improve staff job satisfaction.

Teamwork enhances trust, improves backup in patient care, creates shared mental models, team orientation, and team leadership. However, in the absence of teamwork those elements could be lacking or inadequate, resulting in inadequate patient care. A study by Kalisch and Lee showed an association between lack of teamwork and inadequacy of patient care. Missed patient care was significantly associated with lack of trust, backup, team orientation, team leadership, and shared mental models ($p < .01$). Teamwork was essential in providing quality patient care and with efficient teamwork there was less missed patient care because staff served as backup for each other (Kalisch & Lee, 2010a).

A study by Kalisch et al. evaluated level of staff teamwork and staff participation interventions and what effect they might have on staff job satisfaction, staff burnout, quality of patient care, and patient satisfaction with care. Their study showed staff perception rating of the level of teamwork improved significantly ($p = .000$) post-teamwork intervention. Patients also perceived that nurses responded more quickly to their calls; nurse-patient and family communication increased; and mean rates of patients' falls decreased significantly post-intervention of the teamwork and staff participation intervention ($t = 3.98$, $p < .001$) (Kalisch, Curley, & Stefanov, 2007).

Nurse-physician partnership (teamwork) has been shown to improve patient outcomes. Heinemann, Lengacher, VanCott, Mabe, and Swymer compared experimental and control nursing units to evaluate effects of partnering with other staff on patient satisfaction, patient falls, intravenous (IV) infections, and medication errors. In RN-partnering, the nurse coordinated the

activities of the healthcare team (RN and her/his subordinates). There was a significant difference in patient satisfaction in the experimental units versus the control units ($p = 0.0003$). There were also significant differences in patients' perceptions of timeliness of their needs being met ($F = 9.832$, $p = 0.0019$). The use of RN-partnering in patient care had a significant impact on patients' perceptions of the care they received. Medication errors and patient falls were lower in the experimental units than in the control units also (Heinemann, Lengacher, VanCott, Mabe, and Swymer, 1996). Also, a study by Leppa showed a positive association between RN-RN interaction and patient safety ($r = 0.30$; $p = 0.01$) and quality of patient care ($r = 0.37$; $p = 0.01$) (Heinemann et al., 1996; Leppa, 1996) .

Larrabee et al, investigated the effects of nurse job satisfaction, context of care, structure of care, patient-perceived nurse caring, and nurse-physician collaboration (teamwork) on patients' satisfaction with care. Nurse-physician collaboration (teamwork) showed a weak but significant association with patients' satisfaction ((Larrabee et al., 2003). However, shorter patient hospital stays were associated with the practice of efficient nurse-physician collaboration (teamwork) ($p < .001$) (Appendix 4).

The lack of nurse-physician collaboration, on the other hand, was significantly associated with longer length of hospital stays ($p < .01$) (Tschannen & Kalisch, 2009).

The articles reviewed above showed situations that health care organizations experienced that required creativity in order to provide satisfactory patient care while retaining adequate staff.. One of the interventions which healthcare organizations employed to combat such challenges is teamwork. With effective teamwork there appeared to be feelings of trust, support for each other, and the outcomes of good quality patient care.

Discussion

Findings

Some general effects of teamwork identified in the research literature are group cohesion, social network, staff camaraderie, quality of interactions, staff accountability, quality of communication, perceptions of autonomy, job enjoyment, professional respect, and decreased hierarchies. The practice of teamwork has been shown to increase job satisfaction, reduce job dissatisfaction, burnout, turnover, job stress, and at the same time, it has been associated with high quality patient care, patient satisfaction with care, shorter hospital stays, and reduced cost.

Some principal findings are evident in this review with regards to the effect of nurse-physician teamwork on nurse, physician, and patient outcomes. The first principle relates to nurse job satisfaction which emanates from relationships created in the work environment through teamwork. In a teamwork environment, there is prevalence of trust, backup, team orientation, team leadership, and shared mental models. Active practice of teamwork transforms the job environment so staff members feel accountable to each other and to the group. Team members assume a backup role by helping other team members with their responsibilities and tasks. The back-up role provides support to members of the team and enables team members to adjust plans and reallocate resources based on dynamic information from the environment. In contrast, some studies (Rafferty *et al.*, 2001)showed an association between lack of teamwork or collaboration between nurses and physicians, and an increased tendency of the nurses to quit.

When staff watch out for each other, there is a spirit of camaraderie and individualistic thinking is decreased as members think of the collective good of the team instead of their own good. In such an environment staff feel the desire to participate and contribute positively to the team outcomes which provide them with satisfaction in their job.

The second principle relates to relationships between physicians and nurses. This relationship has traditionally been characterized by giving and carrying out orders, respectively. Traditionally, there has been a steep hierarchical line of demarcation between the nurses and the physicians; however, with teamwork the lines of demarcation between the two are less distinct as both the nurses and the physicians work together with mutual respect, trust, and camaraderie rather than in an adversarial or subordinate role. Contrary to common perception, the effective practice of teamwork actually enhances autonomy instead of taking away from it.

The third principle from this review study relates to the effect of staff job satisfaction on patient outcomes. An important aspect of healthcare is patient safety that could be impacted by many factors, but, perhaps the most important of them is teamwork. Researchers have summarized that staff are likely to give better care when they are satisfied with their jobs, resulting in positive patient outcomes and, on the other hand, when staff members are dissatisfied with their jobs, they also are likely to give poor quality care to the patients, resulting in poor patient outcomes, This was demonstrated in one of the studies reviewed above (Ernst et al. 2004). Impact of staff job dissatisfaction is not limited to the staff but it affects group dynamics and lack of job enjoyment that could result in burnout, poor or sub-minimal job performance, and eventually quitting the job.

Implications

The major implications of this review are that teamwork is essential for staff (nurses' and physicians') job satisfaction, retention, patient satisfaction, and ability of the organization to attract staff and patients. In addition, teamwork could improve the competitive standing of the organization in acquiring and retaining both staff and patients.

However, there could be a misconception that just working together to resolve problems at hand is teamwork. In order to embark on a successful teamwork practice, adequate preparatory

training is essential. Training is essential to recondition staff who, throughout their training in schools of nursing and medicine, have been conditioned to individualistic thinking. Teamwork cannot be built without thinking that puts team outcomes as the basis and goal for all actions and interactions.

Above all, an organization must be committed to the ideals of teamwork for it to be successful in the work place. The benefits of continuous effective active practice of teamwork could outweigh the resources invested. Some of the benefits of practicing effective active teamwork in an organization are: staff satisfaction, patient satisfaction, and camaraderie among staff, amelioration of hierarchies, respect and trust amongst staff whereby staff watch out for each other and assist each other, thus reducing or preventing errors. Other benefits to the organization could be ease of recruiting and retaining staff, increased patient satisfaction with care, and increased patients' tendencies to recommend the organization to their families or acquaintances. Therefore, it could be a very worthwhile venture for organizations to actively embrace the practice of professional teamwork.

In order for many organizations to embrace teamwork practice, certain research findings are necessary to show additional benefits of teamwork to organizations. Some areas of further investigation could be: First, would teamwork among nurses and physicians avert occurrence of lawsuits by patients and/or families against health care organizations? For this review, studies could not be found on this issue. Second, is teamwork among nurses and physicians compatible/synergistic with their (nurses' and physicians') feelings of autonomy? For this review, only one research study could be found to support the compatibility and synergistic nature of teamwork and autonomy. Since some misconceptions regarding the incompatibility of teamwork with autonomy do exist, although not supported by research studies, the only way to

refute the misconception is through research studies. Therefore, further research studies are needed in the two areas mentioned.

Paper Two

Effect of Nurse-Physician Teamwork Practice on Emergency Department Nurses' and Physicians' Perception of Teamwork and Nurse-Physician Job Satisfaction: A Comparative Study

Introduction

In recent years, healthcare organizations have faced shortages of health personnel and as a result managers and hospital administrators have had to create environments favorable to recruiting and retaining staff. Nurses and physicians are key personnel in an organization and their recruitment and retention should take priority in organizational planning. According to studies, satisfied staff were happier with their jobs, enjoyed their jobs, had less burnout, and had a greater tendency to stay on the job (Khuwaja et al., 2004; M. Manojlovich, 2005; Simoens et al., 2006). Also other studies have shown relationships between the practice of teamwork and improvements in staff cohesion and camaraderie, quality of communication, quality of interactions, improved work environment, social networking, trust among staff, working towards common goals, job satisfaction, job enjoyment, reduced burnout, and a tendency to want to stay on the job (DiMeglio, Padula, Piatek, Korber, Barrett, Ducharme et al., 2005; Kalisch & Lee, 2010b; Kovner et al., 2006).

The purpose of this cross-sectional study was to compare nurse-physician perception of teamwork and nurse-physician job satisfaction among staff (registered nurses and physicians) who worked in EDs which had previously undergone formal teamwork training (interventional group) and who stated that teamwork had been operationalized in their EDs, and staff of EDs which did not participate in formal nurse-physician teamwork training (control group) and for

whom teamwork was not operationalized in their EDs. This was a one time post interventional evaluation approximately two to four years after implementation of teamwork. This study's emphasis was on teamwork in the emergency department (ED) because of (a) the chaotic nature of the ED; (b) lack of adequate information regarding incoming patients into the ED; (c) rapid movements of events in the ED; and (d) the realization that close work relationships and reliance on each other to do collectively what one staff could not do alone could lead to positive outcomes for the staff and for the patients. Moreover, there have not been many studies dealing with nurse-physician teamwork in the emergency department.

Literature Review

A cross-sectional study showed associations of teamwork, staff characteristics, and unit characteristics on job satisfaction (N = 3,675). There were associations among staffing level and teamwork, and job satisfaction, in that, when participants perceived both teamwork and the staffing level in their unit higher ($p < 0.001$), they also perceived their job satisfaction to be higher ($p < 0.05$) (Kalisch et al., 2010).

Another study showed that perception of the presence of teamwork was affected by the shift worked and whether the nurses worked full or part time (Rafferty et al. 2001). Sixteen percent (16%) of night shift nurses and twenty-eight per cent (28%) of day shift nurses perceived the presence of teamwork on their shifts. Also, 21% of part-time and 27% of full time nurses felt that they practiced teamwork, $p < 0.01$. Post teamwork training and practice, 14% rated nursing care quality in their units fair; 55% rated it good; and 29% rated it as excellent.

Adams and Bond, 2000) found, when studying teamwork, that work-group cohesion among nurses was associated with 51% of the perception of nurse job satisfaction and staff-patient ratio was associated with 41% of nurse job satisfaction. A stable staff environment was also conducive to maintaining group cohesion and teamwork. Group cohesion improved nurses'

interests in assisting coworkers to cope with stressful patient issues (A. Adams & Bond, 2000). Unit-based team-building strategy correlated with better work-group cohesion (N = 300) with an increase in mean scores from 5.5 pretest to 6.01 posttest (scale of 1-10), (p = < .001). After the introduction of unit-based team building, nurse-nurse interaction scores increased from 68% to 70.79% (p =0.05); nurse-physician interaction improved from 58% to 59% (p = 0.05); job enjoyment improved from 51% to 57% (p = 0.05); and turnover decreased from 9% to 6%, a significant reduction of 33%. Perception of professional practice also improved from 62% to 66% (p < 0.05), (DiMeglio, 2005).

Work-group cohesion, work and family conflicts, variety of work, supervisor support, autonomy, distributive justice, promotional opportunities, and organizational constraints predicted more than 40% of nurse job satisfaction (Kovner et al. 2006). Work-group cohesion alone was associated with 8% (p < 0.01) of nurse job satisfaction (Kovner et al. 2006).

(Doan-Wiggins et al., 1995) studied the basis for physician job satisfaction, attrition of emergency department physicians, and job related stress (N = 1,317) and found that job satisfaction among most resident and primary care (PC) physicians was related to their professional practice conditions, such as: various practice opportunities; job associated prestige; professional respect; and. working relationships. Some primary care physicians (25% of 737) and resident physicians (25% of 737) felt burned out with their jobs and some planned to leave emergency medicine. Physicians who reported a lower mean score of job satisfaction (p = 0.0001 and higher burnout (p = 0.001) planned to stop practicing. (Doan-Wiggins et al., 1995).

A study of physicians' job satisfaction, turnover, and job dissatisfaction, (N = 5,704) revealed similarities in the levels of job satisfaction amongst the generalists and specialists; younger physicians, on the other hand, reported lower job satisfaction than their older counterparts. Physicians (27%) who reported lack of satisfaction with some aspects of their jobs

had a greater tendency to want to quit within two to five years than those with median levels of job satisfaction. Generalists who were not satisfied with their community relationships (OR, 2.26; $p < 0.0001$) or with non-physician staff relationships in their offices (OR, 1.59; $p < 0.01$) were more likely to plan to quit practice than those who had higher scores on job satisfaction measures (OR, 0.60; $p < 0.01$) (Pathman et al., 2002).

Summary of Literature Review:

Staffing levels contributed to the perception of teamwork; the higher the perception of satisfactory staffing, the higher the perception of teamwork, and the higher the perception of job satisfaction. Also, how staff perceived the presence of teamwork on their units, was influenced by the shift worked and, full or part time work status. Job enjoyment and staff job satisfaction were influenced by work-group cohesion.

Age of the staff, working relationships, and shift worked correlated with staff intent to quit and the perception of job satisfaction.

Conceptual Framework

The theoretical framework used is based on Donabedian's structure-process-outcome model of quality care. Donabedian's theory suggested that organizational health care structures affect processes of care and processes of care influence patient outcomes. According to the theory, the three components are connected to form the three parts of quality assessment. Donabedian argued that good structures increase the possibility of good processes and good processes enhance good outcomes (Donabedian, 1966, 1988). This study examined the effect of teamwork, as a process, on nurse-physician perception of teamwork and nurse-physician job satisfaction among staff (registered nurses and physicians). Based on the conceptual frameworks and previous research evidence a conceptual model was developed (Figure 1).

Methodology

Research Design

This was a comparative cross-sectional study of effects of nurse-physician teamwork on the staff who worked in the Interventional Group EDs with those who worked in the Control Group EDs. The study was developed after the Emergency Team Coordination Course (ETCC) was introduced in EDs by Morey et al. from May 1998 to March 1999 to evaluate the impact of the training on the successful practice of teamwork (Morey et al., 2002). The training was patterned after an aviation-oriented teamwork curriculum to train ED staff who are faced with similar life and death situations as those in aviation. The focus of the training was on the following five team areas/values: applying problem solving strategies; maintaining team structure and climate; improving team skills: executing plans; communicating with the team; and managing workload.

Research Procedure

Emergency departments in California that have undergone formal teamwork training by Morey's team and had operationalized its principles in their EDs were members of the interventional group (N = 4) and those that have never participated in this formal teamwork training (ETCC) and did not operationalize its principles were members of the control group (N = 4). The interventional and the control group EDs were invited to participate in the study and of all hospital EDs in Northerrn and Southern California invited, eight were selected and agreed to participate. IRB approval was received from UCLA and from each of the eight participating hospitals.

Staff Participants

The interventional group comprised of a convenience sample of nurses and physicians from all shifts of each of the four interventional hospital EDs. The control group comprised of a

convenience sample of nurses and physicians from all shifts of each of the four control hospital EDs. Invitations to participate in the study and complete survey questionnaires were given to all nurses (RNs) and physicians (MDs) at participating EDs. Staff (RNs and MDs) who had been employed in the ED for a minimum of six months and staff who had worked in full time or part-time positions were qualified to participate in the study. Staff who did not meet the criteria were excluded. Participants were told the purpose of the study and were given opportunities to participate or to refuse. Only those staff who completed and returned questionnaires were considered to have consented to participate in the study. An identification number was assigned to each participating hospital in order to maintain anonymity.

Data were collected over a span of three-years (2009-2011) for a seven-day period in each participating facility. The staff demographic data collected were gender, age, educational level, shift worked, and work/employment status.

One hundred and ninety one (191) staff of the interventional group EDs participated; 166 (86.9%) were nurses and 25 (13.1%) were physicians (Appendix 4). Females comprised a majority of the participants with a mean age of 38.4 years (SD = 9.67), with an average of 6.3 years working in the participating ED, (SD = 6.42). About 10%, 27%, and 48%, of the participating ED staff worked night, evening, and, day shifts, respectively; the participants also had various educational levels. In the control group, 307 staff participated; 267 (87.0%) were nurses and 40 (13%) were physicians. Two hundred and eleven (211, 68.7%) were female; and 84 (27.4%) were male; mean age was 39.3 years (SD = 10.61), and an average of 6.8 years of working in the participating ED (SD = 5.80); about 29%, 23%, and 39% of the participating ED staff worked night, evening, and day shifts, respectively; and participants had various educational levels . There were no significant differences demographically between the interventional and the control groups (age, $p = 0.16$; gender: male/female, $p = 0.40$; employment

category: RN/MD, p = 0.49; educational level, p = 0.25; full-time/part-time, p = 0.55; day/evening/night shift, p = 0.16) (Appendix 4, 4a)

Instruments

The instrument used to assess the effect of teamwork on staff job satisfaction was the Revised Nurse Work Index (NWI-R), (Kramer & Hafner, 1989; Aiken et al., 1994). Psychometric information about NWI-R was described by Aiken and Patrician and reliability was estimated using Cronbach's alpha which equaled 0.96 for the entire NWI-R; the aggregated subscale alphas ranged from 0.84 to 0.91. The original instrument demonstrated validity by its ability to differentiate nurses who worked within a professional practice environment from those who did not, and its capacity to predict differences in nurse burnout (Aiken & Patrician, 2000). When revised to measure physician job satisfaction, every word "nurse" was changed to "physician" and every word referring to "nursing" was changed to "medical."(Appendix 3, 3a).

Data Analysis

The Statistical Analysis Systems (SAS) program, release 9.2 (Cary, NC) was used for data analysis. The dataset was cleaned and typographical errors were corrected. Weighted averages derived by averaging all non-missing values were calculated to account for missing values. The dataset was imported into SAS.

Descriptive statistical analysis was used for demographic variables. The analysis used the two-sample, one-sided t-test to identify significant differences between the interventional group and control groups (p = .05).

Results

Nurse-Physician Perception of Teamwork

The perception of level of teamwork between the nurses and the physicians, using NWI-R, a Likert-type scale of 1-4, the Interventional Groups had a mean score of 3.43, SD 0.88

and the Control Group had a mean score of 3.22; SD = 0.79 The t-test revealed a value of 2.50 ($p < 0.0064$), indicating a significant difference between the two groups (Appendix 5).

*N*urse-Physician Job Satisfaction

Staff job satisfaction data were collected using the Revised Nurse Work Index (NWI-R); on a Likert-type scale of 1 to 4; the Interventional Group had a mean score of 3.11, SD 0.59 and the Control Group had a mean score of 2.88; SD = 0.53 . The t-test revealed a value of 4.40, $p < 0.0001$, indicating the two groups were significantly different (Appendix 5).

Discussion

Practicing teamwork was potentially contributory to improved employee outcomes in relation to an improved perception of the presence of teamwork between nurses and the physicians, and job satisfaction among staff (registered nurses and physicians). Using the t-test to compare mean scores of both groups revealed significant differences in staff perception of teamwork ($p = 0.0006$). The findings demonstrated that staff in the emergency departments (EDs) which operationalized teamwork (Interventional Group) perceived better practice of teamwork by nurses and physicians than those staff who worked in the emergency departments that did not operationalize formal teamwork (the Control Group). Therefore, it could be concluded, based on the findings of this study that successful nurse-physician teamwork in the emergency departments was instrumental to the feelings among nurses and physicians that they were practicing teamwork and in their perception of improved job satisfaction.

The study also explored the effect of nurse-physician teamwork in the ED on the staff who worked in the Interventional Group and those who worked in the Control Group, using the Revised Nurse Work Index (NWI-R) for data collection

The training focused on strategies to maintain team structure and climate, solve problems, maintain team communication, carry out plans and manage workload, and improve team skills (Brannick et al., 1995b; Morey, Simon, Jay, Wears, Salisbury et al., 2002).

On the perception of the level of nurse-physician teamwork in the emergency department, the t-test revealed significant differences between the Interventional and the Control Groups ($p < 0.0064$). There was an association between nurse-physician teamwork in the emergency department and job satisfaction of the staff in the Interventional and Control Groups as shown by the significant differences of t-test results ($p < 0.0001$). The result indicated that the staff who worked in the Interventional Group EDs were more satisfied than their counterparts who worked in the EDs that constituted the Control Group.

Limitations

The study was conducted over a period of three years in multiple hospital emergency departments in Northern and Southern California, to assess the effect of nurse-physician teamwork on nurses and physicians in the emergency department. Regardless of the extent and diligency of data collection and analysis, certain limitations existed. First, the use of cross-sectional design provided a snapshot, short in time, of the phenomena (the effect of nurse-physician teamwork in the emergency department on staff outcomes) being investigated instead of longitudinally. Second, the study could not identify cause and effect relationships because the study was non-experimental. Third, similarities of participating hospital EDs could not be positively identified and that could present confounding factors on the study outcomes and an inability to generalize the findings.

Conclusion

This study demonstrated that the practice of effective nurse-physician teamwork in the emergency department was improved by the administrative support of providing staff with

training on teamwork. The study showed that nurse-physician teamwork training in the emergency department was associated with feelings among nurses and physicians that they were practicing teamwork and in their perception of improved job satisfaction.

Results of this study pointed to the need to invest resources in nurse-physician teamwork training and operationalizing teamwork between nurses and physicians in the emergency department. Nurses and physicians could join their skills together in providing good quality care to the patients while maintaining a positive environment for both disciplines to thrive through teamwork practice.

In any healthcare setting, nurses and physicians form major segments of the workforce, and their relationships with each other and with other healthcare members, could have a remarkable impact on their job satisfaction. Despite common goals between nurses and physicians of providing quality health care and relief to the patients, there has been the traditional relationship between nurses and physicians whereby physicians have maintained dominance and the nurses have displayed deference (El Sayed & Sleem, 2011; Prescott & Bowen, 1985; Vazirani, Hays, Shapiro, & Cowan, 2005). However, in teamwork nurses are working as equal partners with physicians in patient care instead of staying in relegated positions in healthcare (Edmondson, 2003; El Sayed & Sleem, 2011). Genuine teamwork between nurses and physicians in any healthcare setting could contribute to creating a work environment with reduced hierarchies between nurses and physicians, especially, in the ED. Teamwork could, also, serve as an equalizer of hierarchies between nurses and physicians, if there were effective teamwork training and practice. When such an environment exists, the nurses and physicians could excel and coordinate their skills and efforts to deliver better quality care to the patients resulting in increased teamwork and job satisfaction for both professions.

Paper Three

Nurse-Physician Teamwork in the Emergency Department and its Impact on Perceptions of Work Environment, Autonomy, and Control over Practice: A Comparative Study

Introduction

A shortage of healthcare personnel has created challenges and opportunities for managers and hospital administrators to build environments conducive to recruiting and retaining staff. In any health care setting, nurses and physicians are the backbone of the organization. Studies have shown a positive association between teamwork and work environments, autonomy, independence, work discretion and control over practice (DiMeglio, Padula, Piatek, Korber, Barrett, Ducharme et al., 2005; Kalisch & Lee, 2010b; Kovner et al., 2006).

The purpose of this cross-sectional study was to compare perceptions of emergency department (EDs) nurses' and physicians' about their work environment, autonomy, and control over practice among staff who worked in the Interventional and the Control Group EDs. The Interventional Group EDs had previously undergone formal teamwork training and stated that they were actively practicing teamwork, and staff in EDs in the Control Group EDs which did not participate in formal nurse-physician teamwork training and were not actively practicing teamwork. This study focused on teamwork in the EDs because conditions in the EDs are unpredictable and cannot be handled effectively by staff working individually instead of as a team. Moreover, there have not been many studies dealing with teamwork in EDs, particularly in relation to autonomy and the work environment. This was a one-time post interventional evaluation approximately two to four years after implementation of teamwork.

Literature Review

Findings from a study by Rafferty et al. found that the perception of the presence of teamwork was affected by the shift and whether the nurses worked full or part time (2001). Twenty-eight per cent of day shift nurses and 16% of night shift nurses perceived the presence of teamwork on their shifts. Also, 27% of full time nurses and 21% of part-time nurses felt that their unit practiced teamwork ($p < 0.01$). Teamwork was synergic with autonomy and nurses who scored lower in perception of teamwork also scored lower in perception of autonomy; conversely, nurses who scored higher in the perception of teamwork scored higher in autonomy ($p < 0.01$). After teamwork training and practice, 29% rated nursing care quality on their units as excellent; 55% rated it good; and 14% rated it fair.

Hoegl and Parboteeah studied the effects of external influences and internal influences on team autonomy. External influences were in the form of organizational intrusion on the team's empowerment including their inability to make independent operational decisions without prior consultation with higher managers. External influence had the effect of suppressing autonomy of the team ($p = 0.05$). On the other hand, internal influences showed improved team autonomy through team empowerment in making operational decisions without intrusions from higher managers. Therefore, internal influences had positive relationships with teamwork quality, mutual support, cohesion, autonomy, and balance of team members' contributions ($p = 0.05$) (Hoegl & Parboteeah, 2006).

A stable staff was necessary to maintain group-cohesion and teamwork. Group cohesion enhanced the nurses' interests in assisting colleagues to handle stressful patient issues (Adams & Bond, 2000). A study by DiMeglio found that a unit-based team-building strategy was associated with improved group-cohesion ($N = 300$), with an increase in mean scores from 5.5 pretest to 6.01 posttest (scale of 1-10), ($p = < .001$). The following improvements were noticed after the introduction of unit-based team building: the nurse-nurse interaction score improved from 68 to

71% ($p = 0.05$); nurse-physician interaction improved from 58 to 59 ($p = 0.05$); the decision making mean score improved from 47 to 49 ($p < 0.05$); perceptions of autonomy improved from 48 to 53 ($p = 0.05$); job enjoyment increased from 51.26 to 56.58 ($p = 0.05$); and turnover decreased from 9% to 6% (9% - 6% = 3%; 3/9% = 33%), a significant reduction of 33%. The perception of professional practice score also increased from 62% to 66% ($p < 0.05$), (DiMeglio, 2005).

According to Kovner et al., work-group cohesion, autonomy, promotional opportunities, work and family conflicts, supervisor support, variety of work, distributive justice, and organizational constraints predicted more than 40% of nurse job satisfaction (2006).

Summary

Studies above have shown an association between effective practice of teamwork, perceptions of autonomy, and improvements in interpersonal relations among the staff. . The practice of teamwork has been correlated with cohesion among staff and has improved staff willingness to assist each other and to look out for each other.

In order to benefit from the practice of teamwork it is necessary to receive adequate training. The Emergency Team Coordination Course.training has been shown to be effective in reducing hierarchical status between nurses and physicians. The course is taught by a nurse-physician pair which mitigates feelings of superiority between the participating members of the team.

Conceptual Framework

Conceptual Framework of Donabedian

The theoretical framework used as a foundation for this study is based on Donabedian's structure-process-outcome model of quality care (Donabedian, 1966, 1988). Donabedian's theory

proposed that organizational health care structures affect processes of care and processes of care influence patient outcomes. According to the theory, the three components are linked to form the three parts of quality assessment. Donabedian contended that good structures increase the possibility of good processes and good processes enhance good outcomes (Donabedian, 1966, 1988). Applying Donabedian's model to this study shows the relationships between teamwork training/ practice among physicians and nurses and their perceptions of the work environment, autonomy, and control over practice (Figure 1).

Methodology

Research Design

The design of this study is a comparative analysis of the effects of teamwork education and practice on staff, including registered nurses (RNs) and physicians (MDs), in the emergency department (EDs). Data were collected from hospitals that were actively using the training from an Emergency Team Coordination Course (ETCC) in practicing teamwork versus hospital EDs that have not participated in the ETCC course.

The Intervention

In order to practice effective teamwork, the Emergency Team Coordination Course (ETCC) was introduced in EDs by Morey et al. and the effect of the training was evaluated from May 1998 to March 1999 (Morey et al., 2002). The training was an adaptation of an aviation-oriented teamwork curriculum to train staff in EDs who face similar life and death circumstances as those in aviation. The training addressed the following five team dimensions/principles: (1) maintaining team structure and climate; (2) applying problem solving strategies; (3) communicating with the team; (4) executing plans and managing workload; and (5) improving team skills.

A registered nurse and physician paired together as instructors for each group. Each group was comprised of a mixture of nurses and physicians. After the training, each interventional ED created a staffing pattern based on a team concept with a mixture of nurses and physicians in each group. Each interventional ED implemented the training (ETCC) in their operational programs for new staff.

Research Procedure

Emergency departments in California that have undergone similar formal teamwork training and were actively using its principles in their EDs, in either Northern or Southern California, were members of the interventional group (N = 4) and those that have never participated in formal teamwork training (ETCC) and were not using its principles in their EDs, in Northern and Southern California, formed the control group (N = 4). Both groups were invited to participate in the study and eight hospital EDs in Northern and Southern California that agreed to participate in the study formed the interventional and control groups. IRB approval was received from UCLA and from each of the eight participating hospitals.

Staff Participants

Participants were a convenience sample of nurses and physicians from all shifts of each of the four interventional hospital EDs and from all shifts of each of the four control hospital EDs. All nurses (RNs) and physicians (MDs) were invited to participate and to complete survey questionnaires. The sample inclusion criteria were: (1) staff (RNs and MDs) who have worked in the ED for at least six months; (2) staff who were full- or part-time. Those who did not meet the criteria were excluded. The purpose of the study was communicated to the participants and they were given an opportunity to participate or to refuse. Accepting, completing, and returning completed questionnaires constituted consent to participate. Each participating hospital was assigned an identification number to maintain anonymity.

Data were collected over a three-year span (2009-2011) for a seven-day period in each participating facility. The staff demographic data collected included age, gender, educational level, work/employment status, and shift worked.

In the interventional group, 191 staff participated; 166 (87%) nurses and 25 (13%) physicians. A majority were female (126, 66%) with a mean age of 38.4 years (SD = 9.67) and averaged 6.3 years working in the participating ED, (SD = 6.42). About 48%, 27%, and 10% of the participating ED staff worked day, evening, and night shifts, respectively (Table 1a) and the participants also had various educational levels. In the control group, 307 staff participated; 267 (87.0%) nurses and 40 (13%) physicians. Two hundred eleven (69%) were female; and 84 (27%) were male; mean age was 39.3 years (SD = 10.61, and they averaged 6.8 years of working in the participating ED (SD = 5.80); about 39%, 23%, and 29% of the participating ED staff worked day, evening, and night shift, respectively and participants had various educational levels There were no significant differences demographically between the interventional and the control groups (age, $p = 0.16$; gender: male/female, $p = 0.40$; employment category: RN/MD, $p = 0.49$; educational level, $p = 0.25$; full-time/part-time, $p = 0.55$; day/evening/night shift, $p = 0.16$) (Appendix 4, 4a).

Instruments

The Healthcare Team Vitality Instrument (HTVI) was used to measure staff perceptions of the work environment. This ten item instrument was developed as a part of a national program of Robert Wood Johnson Foundation and the Institute for Healthcare Improvement called Transforming Care at the Bedside (Lee, B, & Upenieks, V. 2007).

The Healthcare Team Vitality Instrument (HTVI) is a short 5–point Likert-type survey measure (response options ranging from 1-5) with 1 being strongly disagree and 5 being strongly agree. This instrument has been used in inpatient hospital settings such as medical-surgical units.

It measures front-line staff perception of team vitality, empowerment and engagement, effective communication, team collaboration, and work environment supportive of safe and high quality patient care. Construct validity of scale (extent to which HTVI measures the variables that it is intended to measure) was demonstrated by co-efficient of ≥ 0.90 with a reliability of 0.80 - 0.90. This instrument not only measures the characteristics of the staff and their perceptions of the characteristics of the organization where they work, but also critical factors of interdisciplinary team functioning (Upenieks et al., 2009) (Appendix 3b).

The Revised Nurse Work Index (NWI-R) was used to measure autonomy and control over practice (Kramer & Hafner, 1989; Aiken et al., 1994). Psychometric information about NWI-R was described by Aiken and Patrician and reliability was estimated using Cronbach's alpha which equaled 0.96 for the entire NWI-R; the aggregated subscale alphas ranged from 0.84 to 0.91. The original instrument demonstrated validity by its ability to differentiate nurses who worked within a professional practice environment from those who did not, and its capacity to predict differences in nurse burnout (Aiken & Patrician, 2000). When revised to measure physician job satisfaction, every word "nurse" was changed to "physician" and every word referring to "nursing" was changed to "medical." (Appendix 3, 3a).

Data Analysis

The Statistical Analysis Systems (SAS) program, release 9.2 (Cary, NC) was used for data analysis. The dataset was cleaned and typographical errors were corrected. Weighted averages derived by averaging all non-missing values were calculated to account for missing values.

Descriptive statistical analysis was used for demographic variables. The analysis used the two-sample, one-sided t-test to identify significant ($p = .05$) differences between the interventional group and control groups.

Results

Job Environment

Data on staff perception of Job Environment included access to resources, prompt response by support services, acceptance of openness to discuss challenging patient issues with team members, feelings by team members that they could speak their mind and that their opinions counted, and more especially, staff feelings; that there was free flow of patient care information among team members. Team vitality, empowerment and engagement, effective communication, teamwork, and work environment were collected using the Health Team Vitality Instrument (HTVI). Measuring the above five issues, on a scale of 1-5, the Interventional Group had a mean score of 4.01; SD = 0.86 and the Control Group had a mean score of 3.75; SD = 0.78. The t-test showed a value of 3.25, $p = 0.0006$ indicating a significant difference between the two groups; the interventional group scores were higher (Appendix 5a).

Autonomy

Data on nurse and physician autonomy were collected, using the Revised Nurse Work Index (NWI-R: with a Likert-type scale of 1 to 4). The t-test revealed a mean score of 3.27, SD = 0.59 for the Interventional Group and a mean score of 2.94, SD =0.61 for the Control Group, $p < 0.0001$, indicating a significant difference between the two groups (Appendix 7).

Control over Practice

*N*urse and physician perceptions of control over practice were measured using NWI-R on a Likert-type scale of 1-4; the Interventional Group had a mean score of 3.09, SD 0.73 and the Control Group had a mean score of 2.86; SD = 0.64. The t-test revealed a value of 3.27, $p < 0.0001$, indicating a significant difference between the two groups (Appendix 5).

Discussion

Implementation of teamwork training and application of learning was potentially instrumental in better staff outcomes in the form of improved perceptions of the work environment, autonomy, and control over practice as could be seen in this study. There was an association between perceptions of nurse-physician teamwork and improved staff outcomes. There was a significant difference between the interventional and the control groups in staff perceptions of the work environment including team vitality, empowerment and engagement, effective communication, and teamwork. Applying the t-test to the mean scores of both groups demonstrated significant differences in staff perception of teamwork ($p = 0.0006$). The findings demonstrated that staff in the emergency departments (EDs) which practiced teamwork (Interventional Group) perceived that there was effective communication, that their opinions were important, and that they were listened to by their superiors and counterparts. As a result, they felt empowered and were more engaged in the functioning of their EDs than those staff who worked in the EDs belonging to the control group. Therefore, it could be concluded, based on the findings of this study that effective nurse-physician teamwork in the emergency departments appears to influence nurses' and physicians' perceptions of the positive nature of the work environment.

The study also explored the effect of nurse-physician teamwork in the ED on staff perceptions of autonomy using the Revised Nurse Work Index (NWI-R) for data collection. Perceptions of support, freedom to make decisions regarding patient care and lack of intrusion increased the perceptions of autonomy in the Interventional Group ED staff, compared to their counterparts who worked in the Control Group EDs. Based on the findings, the Interventional Group ED staff perceived they had more autonomy than the Control Group ED staff. Staff in the Interventional Group perceived that their supervisory staff were supportive of them; that they

were not put in a position of doing things against their judgment; and that they were free to make important patient care and work decisions (control over practice) without interference from their management staff. However, staff who worked in the Control Group EDs did not feel so positive about the amount of autonomy accorded them by their management staff. Study findings support those from a study by DiMeglio (2005) which showed that implementation of a unit-based team-building strategy was associated with improved perceptions of autonomy from the pre-implementation score of 48.26% to a post implementation score of 52.98% ($p = 0.05$).

Differences in staff feelings of control over practice between staff who worked in the Interventional Group EDs and those who worked in the Control Groups EDs were also tested. The Interventional Group ED staff felt that they had control over their practice based on the feelings that: they had adequate support services to enable them to spend adequate time with patients; ample time to discuss patient care issues with other staff; an adequate number of staff to provide quality patient care; that patient care assignments fostered continuity of patient care; and they had good managers and leaders ($p = 0.0006$). On the other hand, staff who worked in the Control Group EDs did not feel that they had as much control over their practice

The result of interpersonal relationships between the nurses and the physicians is one of the pieces of evidence of the effect of the Emergency Team Coordination Course, to make teamwork operational in the emergency department. The training focused on strategies to maintain team structure and climate, solve problems, maintain team communication, carry out plans and manage workload, and improve team skills (Brannick et al., 1995b; Morey, Simon, Jay, Wears, Salisbury et al., 2002). Based on the findings of the present study, it appears that the interpersonal relations between nurses and physicians significantly improved in the Interventional Group over the Control Group.

On the perception of the level of nurse-physician teamwork in the emergency department, the t-test revealed significant differences between the Interventional and the Control Groups ($p < 0.0064$). There was an association between nurse-physician teamwork in the emergency department and staff perceptions of the work environment ($p = .0006$), autonomy ($p = .0006$), and control over practice ($p = .0006$). In all three variables, the Interventional Group staff had higher perceptions than their counterparts who worked in the Control Group EDs.

The theoretical framework of this study, based on Donabedian's Structure-Process-Outcome indicated that structures, like the Teamwork Training Program, would affect the processes of the ED, that include supervisory support and staff communication, and the result would be better outcomes, like perceptions of the work environment, autonomy, and control over practice. While this research identified positive staff outcomes, it did not identify significant patient results; future research might further examine the relationship between improved staff outcomes and patient outcomes.

Limitations

This study was conducted over a period of three years in multiple hospital emergency departments in Northern and Southern California. Despite the scope and multiple methods of data collection and analysis, there were certain limitations. First, the use of cross-sectional design did not allow for a longitudinal study of the effect of nurse-physician teamwork in the emergency department on staff outcomes. Findings of this study are a snapshot of the effect of nurse-physician teamwork in the emergency department on staff outcomes of both the Interventional and Control Groups; therefore, findings of this study should be interpreted with caution. However, the positive results of the teamwork training had lasted two to three years. Second, this is a non-experimental study which did not provide the ability to establish cause and effect relationships. Third, there was an inability to show that there were no other confounding

variables (factors) such as similarities of the facilities or lack of similarities, accounting for the findings. Fourth, although eight emergency departments throughout California participated in the study, the use of convenience samples might have contributed to a lack of generalizability.

Conclusion

The study showed positive effects of nurse-physician teamwork in the emergency department on perceptions of the work environment, autonomy, and control over practice setting for both physicians and nurses.

Results of this study pointed to the value of investing resources in nurse-physician teamwork in the emergency department. Through teamwork, nurses and physicians could combine their expertise and coordinate good quality care to the patients while maintaining a positive environment for both disciplines to thrive.

This may affect patients' outcomes, as well as staff enjoyment of the work environment. Although both nurses and physicians have common goals of providing quality health care and comfort to the patients, the traditional relationship between them has been that of physician dominance and of nurse deference (El Sayed & Sleem, 2011; Prescott & Bowen, 1985; Vazirani et al., 2005). However, nurses are no longer having to accept subordinate positions in healthcare but are working as equal partners with physicians in patient care (Edmondson, 2003; El Sayed & Sleem, 2011). Partnerships could be possible through genuine teamwork practice between the nurses and the physicians, not only in the emergency department (ED), but in any healthcare setting that embraces genuine teamwork. Teamwork, preceded by effective teamwork training, could serve as an equalizer of hierarchies between the nurses and the physicians in the ED. Then nurses and physicians could thrive in their individual roles and effective coordination would contribute to quality patient care.

Appendix 1
Staff Informational Sheet

Title of the Study: Nurse-Physician Teamwork in the Emergency Department (ED)

Principal Investigator: The Principal Investigator is David O. Ajeigbe, RN, UCLA Doctoral Candidate, 5974 Arlington Avenue, Riverside, CA. 92504-1910. Phone: (951) 805-8803.

Reason for Participation: You are being asked to participate in this UCLA research study as nurses and physicians working at (Insert name and address of hospital).

***Voluntary Participation*:** You may decide to or not to participate in this study. If you agree to participate in the study you could terminate your participation at any time during the study. Your choice to participate or not to participate will have no effect on your employment or privileges' with Mission Hospital, Mission Viejo.. You are not waiving any of your legal rights by agreeing to participate in this research. This research will be conducted in eight sites with a total of 200 or more participating nurses and 200 or more participating physicians. Your participation is only for the duration of time that it takes you to respond to some questionnaires which might not be more than a maximum of 30 minutes. Accepting, completing, and returning completed questionnaires will serve as your consent to participate and refusal to accept, complete, or return completed questionnaires constitutes refusal to consent to participate. The participant demographic data to be collected include age, gender, educational level, ethnicity, and no other personal or health information will be accessed.

Research Conduction: The Principal Investigator and his assistants will conduct this research. This is a UCLA research study and not for the emergency department's quality assurance/quality improvement.

Purpose: To determine effects of teamwork on staff outcomes. This study is to compare differences in teamwork and its effects on staff between four hospital emergency departs (interventional group) that are actively using the principles from an Emergency Team Coordination Course (ETCC) and four hospital emergency departments (control group) that did not participate in and are not using teamwork principles from the course. Teamwork could improve staff outcome such as staff (RNs/MDs) perception of teamwork, job stress, job satisfaction. The study is not intended to change job satisfaction in the emergency department. Sample questions in the questionnaires are: 1). I feel as if I am used to fill an empty slot. 2). A feeling of team spirit exists on my shift.

Confidentiality: Your name will not appear on the questionnaires; therefore, there is no means for anyone to know who participates and who does not participate. There is also no way for anyone to know your individual response. There will be a code number on each questionnaire denoting the hospital emergency department and questionnaire number. This identifying code is to identify one hospital emergency department from another. Data will be communicated to the hospital emergency departments that request it in aggregate form without any identify information included. This differentiation will not appear in any publication. Thus your anonymity and of your hospital emergency department will be maintained.

Potential Risks: There will be no risks to you for participating in this study other than is possible in everyday activities. Your confidentiality will be maintained diligently. There might be some questions that might elicit stress to some participants.

Compensation: Upon completion and return of the questionnaires, the researcher or research assistants will give each participant a $10.00 gift certificate.

Contact Person: You should contact the Principal Investigator at (951) 805-8803 for any issue, clarification, or concern. For questions about your right as a participant in research, or to address

complaints about the research, you should contact Gloria Verghese, Administrator, Office for Protection of Research Subjects, South General Instutional Review Board, 11000 Kinros Avenue, Suite 102, Los Angeles, California. (310) 825-3969.

Thank you for your consideration.

David O. Ajeigbe, RN
UCLA Doctoral Candidate

Appendix 2
Patient Information Sheet

Title of the Study: Nurse-Physician Teamwork in the Emergency Department (ED)

Principal Investigators: David O. Ajeigbe, RN, UCLA Doctoral Candidate

Reason for Participation: You are being asked to participate in this research study because you or your child has just been treated in the emergency department (ED).

***Voluntary Participation*:** You may decide to participate or not to participate in this study. If you agree to participate in the study you can stop your participation at any time during the study. Your choice to participate or not to participate will have no effect your care at (Insert name and address of hospital here).

You are not waiving any of your legal rights by agreeing to participate in this research. This research is being conducted at 8 sites with a total of about 800 or more participating patients. Your participation is only for the duration of time that it takes you to respond to a questionnaire which might not be more than a maximum of 10 minutes.

Accepting, completing, and returning completed questionnaires will serve as your consent to participate and refusal to accept, complete, or return completed questionnaires constitutes refusal to consent to participate. Information to be collected includes you or your child's age, gender, educational level, and ethnicity. No other personal or health information will be used.

Research Conduction: The Principal Investigator and his assistants will conduct this research. This is a research study for Mr. Ajeigbe's UCLA Doctoral Thesis and not for the emergency department's quality assurance/quality improvement.

Purpose: To determine effects of teamwork on patient outcomes. This study is to compare differences in teamwork and its effects on patients between 4 hospital emergency departments that are using the principles from an Emergency Department teamwork course and 4 hospital

emergency departments that are not using the teamwork principles from the course. Teamwork could improve patient outcome such as care satisfaction, medical and non-medical errors. The study is not intended to change care satisfaction in the emergency department. Sample questions in the questionnaires include "My care givers helped each other" or "I am satisfied with the care I received."

Confidentiality: You or your child's name will not appear on the questionnaires; therefore, there is no means for anyone to know who participates and who does not participate. There is also no way for anyone to know your individual response. There will be a hospital code number on each questionnaire; however, this is only to identify one hospital emergency department from another. Information will be given to the hospitals that request it without any identifying information included.

Potential Risks: There is no risk to you or your child for participating in this study other than what is possible in everyday activities. Your confidentiality will be maintained. You may refuse to answer any questions that make you uncomfortable. Your refusal to participate or answer certain questions will not affect your or your child's future care or treatment.

Compensation: There will be no compensation for your participation; however, it will be highly appreciated.

Note: For questions about your right as a participant in research, or to address complaints about the research, you should contact Gloria Verghese, Administrator, Office for Protection of Research Subjects, South General Instutional Review Board, 11000 Kinros Avenue, Suite 102, Los Angeles, California. (310) 825-3969.

Thank you for your consideration.

David O. Ajeigbe, RN
UCLA Doctoral Candidate

Appendix 2a

Hoja de Información de Paciente

Título del Estudio: Trabajo en Equipo de Los Médicos/Enfermeras de la Sala de Emergencias (DE)

Numero de Proyecto:

Investigadores Principales: David O. Ajeigbe, RN, Candidato Doctoral UCLA

Razón de Participación: Se le ha pedido participar en este caso de evaluación porque usted o su hijo acaba de recibir tratamiento en la sala de emergencias (SE).

Participación Voluntaria: Usted puede decidir participar o no participar en este estudio. Si decide participar en este estudio, puede dejar de participar en cualquier momento. Su decisión de participar o no participar, no afectará el cuidado que reciba en el (Ponga el nombre y dirección del hospital aqui).

No está renunciando a ninguno de sus derechos legales al decidir participar en esta investigación. Dicha investigación se lleva a cabo en 8 lugares con un total de alrededor de 800 o más pacientes participantes. Su participación solamente durará el tiempo que le tome responder a un cuestionario, el cual podría no exceder 10 minutos.

Aceptar, completar y devolver el cuestionario completado se tomará como su consentimiento para participar y si se rehúsa a aceptar, completar o devolver el cuestionario completado, se tomará como su negación a participar. La información recolectada incluye su edad (o la de su hijo), sexo, nivel educativo y etnia. No se usará ninguna otra información personal o de salud.

Proceso de Investigación: El investigador principal y sus asistentes llevarán a cabo esta investigación. Se trata de un estudio de evaluación para la Tesis Doctoral del Sr. Ajeigbe en UCLA y no para supervisar ni mejorar de calidad de la sala de emergencia.

Propósito: Para determinar los efectos del trabajo en equipo en los resultados de los pacientes. Este estudio es para comparar las diferencias entre trabajo en equipo y sus efectos en pacientes, en 4 salas de emergencias de hospitales que usan los principios del curso trabajo en equipo de la Sala de Emergencias y 4 salas de emergencias de hospitales que no usan los principios de trabajo en equipo del curso. El trabajo en equipo puede mejorar el resultado en los pacientes, como la satisfacción con su cuidado, y errores médicos o no médicos. Ejemplos de preguntas que aparecen en los cuestionarios serían: "Mis cuidadores se ayudaron mutuamente" o "Estoy satisfecho(a) con el cuidado que recibí".

Confidencialidad: Su nombre, o el de su hijo, no aparecerá en los cuestionarios; por lo tanto, significa que nadie puede saber quién participó o no. Tampoco hay manera de que alguien pueda saber su respuesta individual. Cada cuestionario tiene el número de código de cada hospital; sin embargo, se usa solamente para identificar la sala de emergencias de los hospitales. La información se le dará a los hospitales que la soliciten sin incluir información que identifique al paciente.

Riesgos Potenciales: Ni usted ni su hijo correrán riesgo alguno por participar en este estudio, salvo el riesgo que pueda surgir de sus actividades cotidianas. Se mantendrá su confidencialidad. Usted puede dejar sin contestar las preguntas que le hagan sentir incómodo. Su negación a participar o responder algunas preguntas no afectará el cuidado que reciba en el futuro.

Compensación: No habrá compensación por su participación; sin embargo, será sumamente agradecida.

Nota: Para preguntas relacionadas con su derecho a participar en esta evaluación, o para dirigir quejas sobre esta evaluación, contacte Gloria Verghese, Administrator, Office for Protection of Research Subjects, South General Instutional Review Board, 11000 Kinros Avenue, Suite 102, Los Angeles, California. (310) 825-3969.

Gracias por su consideración.

David O. Ajeigbe, RN
Candidato Doctoral UCLA

Appendix 3
NWI-R Subscale Questions for Nurses

The following items represent statements about *job environment* with your current work at this hospital. Circle the number that most closely indicates the extent to which the item is present in your current job:

	Strongly Disagree			Strongly Agree
Nurse Autonomy				
1. A supervisory staff that is supportive of the nurses.	1	2	3	4
2. Nursing controls its own practice.	1	2	3	4
3. Freedom to make important patient care and work decisions.	1	2	3	4
4. Not being placed in a position of having to do things that are against my judgment.	1	2	3	4
5. A head nurse who backs up the nursing staff in decision-making.	1	2	3	4
Control Over the Practice Setting				
1. Adequate support services allow me to spend time with my patients.	1	2	3	4
2. Enough time to discuss patient care problems with other nurses.	1	2	3	4
3. Enough registered nurses on staff to provide quality patient care.	1	2	3	4
4. A head nurse who is a good manager and leader.	1	2	3	4
5. Enough staff to get the work done.	1	2	3	4
6. Opportunity to work on a highly specialized patient care unit.	1	2	3	4
7. Patient care assignments that foster continuity of care.	1	2	3	4
Nurse Relations With Physicians				
1. Physicians and nurses have good relationships.	1	2	3	4
2. A lot of teamwork between nurses and doctors.	1	2	3	4

NWI-R JOB SATISFACTION SURVEY

The following items represent statements about *job satisfaction* with your current work at this hospital. Circle the number that most closely indicates the extent to which the item is present in your current job:

		Strongly Disagree			**Strongly Agree**
1.	Enough registered nurses on staff to provide quality patient care.	1	2	3	4
2.	A nurse manager who is a good manager and leader.	1	2	3	4
3.	Flexible or modified work schedules are available.	1	2	3	4
4.	Physicians and nurses have good working relationships.	1	2	3	4
5.	A good orientation program for newly employed nurses.	1	2	3	4
6.	A supervisory staff that is supportive of nurses.	1	2	3	4
7.	A satisfactory salary.	1	2	3	4
8.	Nursing controls its own practice.	1	2	3	4
9.	Active staff development or continuing education programs for nurses.	1	2	3	4
10.	Career development/clinical ladder opportunities.	1	2	3	4
11.	Opportunity for staff nurses to participate in policy decisions.	1	2	3	4
12.	Support for new and innovative ideas about patient care.	1	2	3	4
13.	Enough time and opportunity to discuss patient care problems with other nurses.	1	2	3	4
14.	A chief nursing officer who is highly visible and accessible to staff.	1	2	3	4
15.	Enough staff to get the work done.	1	2	3	4
16.	Freedom to make important patient care and work decisions.	1	2	3	4
17.	Praise and recognition for a job well done.	1	2	3	4
18.	The opportunity for staff nurses to consult with clinical nurse specialists or expert nurse clinicians.	1	2	3	4

		Strongly Disagree			Strongly Agree
19.	Good working relationships with other hospital departments.	1	2	3	4
20.	Adequate support services allow me to spend time with my patients.	1	2	3	4
21.	Not being placed in a position of having to do things that are against my nursing judgment.	1	2	3	4
22.	High standards of nursing care are expected by the administration.	1	2	3	4
23.	A chief nursing officer equal in power and authority to other top-level hospital executives.	1	2	3	4
24.	A lot of teamwork between nurses and physicians.	1	2	3	4
25.	Physicians give high-quality medical care.	1	2	3	4
26.	Opportunities for advancement.	1	2	3	4
27.	Nursing staff are supported in pursuing degrees in nursing.	1	2	3	4
28.	A clear philosophy of nursing that pervades the patient care environment.	1	2	3	4
29.	Nurses actively participate in efforts to control costs.	1	2	3	4
30.	Working with nurses who are clinically competent.	1	2	3	4
31.	The nursing staff participate in selecting new equipment.	1	2	3	4
32.	A nurse manager who backs the nursing staff in decision-making, even if the conflict is with a physician.	1	2	3	4
33.	Administration that listens and responds to employee concerns.	1	2	3	4
34.	An active quality-assurance program.	1	2	3	4
35.	Staff nurses are involved in the internal governance of the hospital (i.e., policy committees).	1	2	3	4
36.	Collaboration between nurses and physicians.	1	2	3	4
37.	A preceptor program for newly hired nurses.	1	2	3	4
38.	Nursing care is based on a nursing rather than a medical model.	1	2	3	4
39.	Staff nurses have the opportunity to serve on hospital and nursing committees.	1	2	3	4

		Strongly Disagree			Strongly Agree
40.	The contributions that nurses make to patient care are publicly acknowledged.	1	2	3	4
41.	Nurse managers consult with staff on daily procedures and problems.	1	2	3	4
42.	A work environment that is pleasant, attractive, and comfortable.	1	2	3	4
43.	Opportunity to work on a highly specialized patient care unit.	1	2	3	4
44.	Written, up-to-date nursing care plans for all patients.	1	2	3	4
45.	Patient care assignments that foster continuity of care, i.e., the same nurse cares for the patient from one day to the next.	1	2	3	4
46.	Staff nurses do not have to float from their designated unit.	1	2	3	4
47.	Staff nurses actively participate in developing their own work schedules (i.e., what days they work).	1	2	3	4
48.	Each patient care unit determines its own policies and procedures.	1	2	3	4
49.	Working with experienced nurses who "know" the hospital system.	1	2	3	4

<u>Optional:</u> Please tell us something about yourself and the characteristics of your work setting.

1. **Gender**: male …… 1
female …. 2

2. **Age in years**: 20-30, 31-40, 41-50, 51-60, 61-65+ years

3. **Years as a nurse**: 0-10, 11-20, 21-30, 31-40, 41+, years

4. **Education level**:
Diploma …… 1
Associates ….. 2
BSN …… 3
Masters …… 4
PhD …… 5
Other …… 6

5. **Work status**:
full-time….. 1
part-time ….. 2

6. **Shift**: day ……1
evening --2

night -----3

7. **Years on present unit**: _____ years

8. **Charge nurse responsibilities**: yes …… 1
no …… 2

9. **Perceptions of job security**: secure …… 1
insecure …… 2

10. **Intent to leave**: no …… 1
yes …... 2

11. **Overall, I am happy in my current job**: yes ……1
no …… 2

Source: Kramer & Hafner, 1989
Aiken et al., 1994

Appendix 3a
NWI-R Subscale Questions for Physicians

The following items represent statements about *job environment* with your current work at this hospital. Circle the number that most closely indicates the extent to which the item is present in your current job:

	Strongly Disagree			**Strongly Agree**
Physician Autonomy				
1. A supervisory staff that is supportive of the physicians.	1	2	3	4
2. Medicine controls its own practice.	1	2	3	4
3. Freedom to make important patient care and work decisions.	1	2	3	4
4. Not being placed in a position of having to do things that are against my judgment.	1	2	3	4
5. A chief physician who backs up the medical staff in decision-making.	1	2	3	4
Control Over the Practice Setting				
1. Adequate support services allow me to spend time with my patients.	1	2	3	4
2. Enough time to discuss patient care problems with other physicians.	1	2	3	4
3. Enough physicians on staff to provide quality patient care.	1	2	3	4
4. A chief physician who is a good manager and leader.	1	2	3	4
5. Enough staff to get the work done.	1	2	3	4
6. Opportunity to work on a highly specialized patient care unit.	1	2	3	4
7. Patient care assignments that foster continuity of care.	1	2	3	4
Nurse Relations With Physicians				
1. Physicians and nurses have good relationships.	1	2	3	4
2. A lot of teamwork between physicians and nurses.	1	2	3	4

NWI-R JOB SATISFACTION SURVEY (Physician)

The following items represent statements about *job satisfaction* with your current work at this hospital. Circle the number that most closely indicates the extent to which the item is present in your current job:

		Strongly Disagree			Strongly Agree
50.	Enough physicians on staff to provide quality patient care.	1	2	3	4
51.	A physician manager who is a good manager and leader.	1	2	3	4
52.	Flexible or modified work schedules are available.	1	2	3	4
53.	Physicians and nurses have good working relationships.	1	2	3	4
54.	A good orientation program for newly employed physicians.	1	2	3	4
55.	A supervisory staff that is supportive of physicians.	1	2	3	4
56.	A satisfactory salary.	1	2	3	4
57.	Physician controls its own practice.	1	2	3	4
58.	Active staff development or continuing education programs for physicians.	1	2	3	4
59.	Career development/clinical ladder opportunities.	1	2	3	4
60.	Opportunity for staff physicians to participate in policy decisions.	1	2	3	4
61.	Support for new and innovative ideas about patient care.	1	2	3	4
62.	Enough time and opportunity to discuss patient care problems with other physicians.	1	2	3	4
63.	A chief medical officer who is highly visible and accessible to staff.	1	2	3	4
64.	Enough staff to get the work done.	1	2	3	4
65.	Freedom to make important patient care and work decisions.	1	2	3	4
66.	Praise and recognition for a job well done.	1	2	3	4
67.	The opportunity for staff physician to consult with clinical physician specialists or expert nurse clinicians.	1	2	3	4

		Strongly Disagree			Strongly Agree
68.	Good working relationships with other hospital departments.	1	2	3	4
69.	Adequate support services allow me to spend time with my patients.	1	2	3	4
70.	Not being placed in a position of having to do things that are against my medical judgment.	1	2	3	4
71.	High standards of medical care are expected by the administration.	1	2	3	4
72.	A chief medical officer equal in power and authority to other top-level hospital executives.	1	2	3	4
73.	A lot of teamwork between nurses and physicians.	1	2	3	4
74.	Nurses give high-quality nursing care.	1	2	3	4
75.	Opportunities for advancement.	1	2	3	4
76.	Medical staff are supported in pursuing specialties in medicine.	1	2	3	4
77.	A clear philosophy of medicine that pervades the patient care environment.	1	2	3	4
78.	Physicians actively participate in efforts to control costs.	1	2	3	4
79.	Working with physicians who are clinically competent.	1	2	3	4
80.	The medical staff participate in selecting new equipment.	1	2	3	4
81.	A physician manager who backs the physician staff in decision-making, even if the conflict is with a nurse.	1	2	3	4
82.	Administration that listens and responds to employee concerns.	1	2	3	4
83.	An active quality-assurance program.	1	2	3	4
84.	Staff physicians are involved in the internal governance of the hospital (i.e., policy committees).	1	2	3	4
85.	Collaboration between nurses and physicians.	1	2	3	4
86.	A preceptor program for newly hired physicians.	1	2	3	4
87.	Medical care is based on a medicine rather than a nursing model.	1	2	3	4

		Strongly Disagree			Strongly Agree
88.	Staff physicians have the opportunity to serve on hospital and medical committees.	1	2	3	4
89.	The contributions that physicians make to patient care are publicly acknowledged.	1	2	3	4
90.	Physician managers consult with staff on daily procedures and problems.	1	2	3	4
91.	A work environment that is pleasant, attractive, and comfortable.	1	2	3	4
92.	Opportunity to work on a highly specialized patient care unit.	1	2	3	4
93.	Written, up-to-date medical care plans for all patients.	1	2	3	4
94.	Patient care assignments that foster continuity of care, i.e., the same physician cares for the patient from one day to the next.	1	2	3	4
95.	Staff physicians do not have to float from their designated unit.	1	2	3	4
96.	Staff physicians actively participate in developing their own work schedules (i.e., what days they work).	1	2	3	4
97.	Each patient care unit determines its own policies and procedures.	1	2	3	4
98.	Working with experienced physicians who "know" the hospital system.	1	2	3	4

Please tell us something about yourself and the characteristics of your work setting.

1. **Gender**: male …… 1
female …. 2

2. **Age in years**: _____ years

3. **Years as a physician**: _____ years

4. **Education level**:
MD …… 1
DO …..… 2
Masters …… 4
PhD …… 5
Other …… 6

5. **Work status**:
full-time….. 1
part-time ….. 2

6. **Shift**:
day …… 1
evening …… 2
night ….. 3

7. **Years on present unit**: _____ years

8. **Physician in Charge responsibilities**: yes …… 1

no …… 2

9. **Perceptions of job security**: secure …… 1
insecure …… 2

10. **Intent to leave**: no …… 1
yes …... 2

11. **Overall, I am happy in my current job**: yes ……1
no …… 2

Source: Kramer & Hafner, 1989
Aiken et al., 1994

Appendix 3b
Healthcare Team Vitality Instrument (HTVI)

The following questions ask you about your current work environment. Circle the number that most closely indicates the extent to which the item is present in your current job:

Please specify the categories of employees that will be answering the survey in a check box fashion:

Ex. Registered Nurse ____ Physician ____ LVN ____ Nursing Asst. ____
Unit Clerk _____ Dietary personnel _____ Respiratory Therapist ____ Phys. Ther. ____
Other _____

		Strongly Disagree				Strongly Agree
1.	I have easy access to the supplies and equipment I need to do my work on this unit.	1	2	3	4	5
2.	The support services to this unit respond in a timely way.	1	2	3	4	5
3.	I can discuss challenging issues with care team members on this unit.	1	2	3	4	5
4.	My ideas really seem to count on this unit.	1	2	3	4	5
5.	I speak up if I have a patient safety concern.	1	2	3	4	5
6.	Care team members on this unit feel free to question the decisions or actions of those with more authority.	1	2	3	4	5
7.	Important patient care information is exchanged during shift changes.	1	2	3	4	5
8.	If I have an idea about how to make things better on this unit, the manager and other staff are willing to try it.	1	2	3	4	5
9.	Care professionals communicate complete patient information during hand-offs.	1	2	3	4	5
10.	Essential patient care equipment is in good working condition on this unit.	1	2	3	4	5

Appendix 3c

JOB STRESS SCALE NURSING STAFF

For each numbered item below, mark the appropriate response.

A = Almost always **O = Occasionally**
F = Frequently **R = Rarely**

1. The immediate supervisor respects my judgment	(+) A F O R	26. Physicians consider my judgment during emergencies	(+) A F O R
2. My knowledge is respected by coworkers	(+) A F O R	27. I feel that my knowledge is current	(+) A F O R
3. I feel as if I am used to fill an empty slot	(-) A F O R	28. My patient care is interrupted by paperwork	(-) A F O R
4. My unit does not have the equipment needed for the patients	(-) A F O R	29. New staff are not well oriented before being assigned to give care on my unit	(-) A F O R
5. My unit is noisy	(-) A F O R	30. I am able to keep up with technological advances	(-) A F O R
6. I can give quality patient care under pressure	(+) A F O R		
7. I have time to give quality patient care	(+) A F O R	31. The unnecessary prolongation of life distresses me	(-) A F O R
8. I feel comfortable making patient care decisions	(+) A F O R	32. Time prevents me from giving emotional support to patients	(-) A F O R
9. Time prevents me from giving emotional support to the families of patients	(-) A F O R	33. There is adequate staffing on the unit	(+) A F O R
10. Caring for dying patients is upsetting for me	(-) A F O R	34. My knowledge is respected by the immediate supervisor	(+) A F O R
11. Opportunities for job advancement are available to people in my job category	(+) A F O R	35, Nursing care supplies are available when needed	(+) A F O R
12. I am capable of giving my patient quality physical nursing care	(+) A F O R	36. Staff need support from others to cope with the job	(-) A F O R
13. Counseling helps a person remain concerned for patients	(+) A F O R	37. Patient's needs can be met according to priority on this unit	(-) A F O R
14. My clinical judgments are questioned by co-workers	(-) A F O R	38. I feel comfortable giving other workers directions for nursing care	(+) A F O R
15. A feeling of team spirit exists on my shift	(+) A F O R	39. Some staff participate in group or individual counseling at work	(+) A F O R
16. I am distressed when patients have major setbacks or die	(-) A F O R	40. I am able to express my real feelings about patients in serious situations	(+) A F O R
17. Patients equipment is maintained	(+) A F O R	41. I am able to cope with job distress	(+) A F O R

for my ready use			
18. Group or individual counseling is available to staff at work	(+) A F O R	42. Physicians respect my knowledge	(+) A F O R
19. Organizing my daily work requires too much time	(+) A F O R	43. A lack of work space distresses me	(+) A F O R
20. I feel confident in my abilities	(+) A F O R	44. Staffing permits me to work a satisfying schedule	(+) A F O R
21. Adequate relief is regularly provided for lunch, coffee break	(+) A F O R	45. I have sufficient preparation to operate the specialized equipment used on units where I work	(+) A F O R
22. I cover my anxiety about a patient with a smile	(+) A F O R	46. I am able to provide the nursing care that I want to during the length of my work shift	(+) A F O R
23. My judgments are respected by physicians	(+) A F O R	47. My work schedule is stressful	(+) A F O R
24. I feel like taking a mental health day after a patient does poorly	(+) A F O R	48. I doesn't help to talk over work stresses with my friends outside the health field	(+) A F O R
25. The work won't get done if I don't do it personally	(+) A F O R	49. Staffing allows me to attend continuing education events	(+) A F O R

Appendix 3d
JOB STRESS SCALE PHYSICIANS

For each numbered item below, mark the appropriate response. **A = Almost always** **O = Occasionally** **F = Frequently** **R = Rarely**

1. The immediate supervisor respects my judgment	(+) A F O R	26. Nurses consider my judgment during emergencies	(+) A F O R
2. My knowledge is respected by coworkers	(+) A F O R	27. I feel that my knowledge is current	(+) A F O R
3. I feel as if I am used to fill an empty slot	(-) A F O R	28. My patient care is interrupted by paperwork	(-) A F O R
4. My unit does not have the equipment needed for the patients	(-) A F O R	29. New staff are not well oriented before being assigned to give care on my unit	(-) A F O R
5. My unit is noisy	(-) A F O R	30. I am able to keep up with technological advances	(-) A F O R
6. I can give quality patient care under pressure	(+) A F O R		
7. I have time to give quality patient care	(+) A F O R	31. The unnecessary prolongation of life distresses me	(-) A F O R
8. I feel comfortable making patient care decisions	(+) A F O R	32. Time prevents me from giving emotional support to patients	(-) A F O R
9. Time prevents me from giving emotional support to the families of patients	(-) A F O R	33. There is adequate staffing on the unit	(+) A F O R
10. Caring for dying patients is upsetting for me	(-) A F O R	34. My knowledge is respected by the immediate supervisor	(+) A F O R
11. Opportunities for job advancement are available to people in my job category	(+) A F O R	35. Medical care supplies are available when needed	(+) A F O R
12. I am capable of giving my patient quality medical care	(+) A F O R	36. Staff need support from others to cope with the job	(-) A F O R
13. Counseling helps a person remain concerned for patients	(+) A F O R	37. Patient's needs can be met according to priority on this unit	(-) A F O R
14. My clinical judgments are questioned by co-workers	(-) A F O R	38. I feel comfortable giving other workers directions for medical care	(+) A F O R
15. A feeling of team spirit exists on my shift	(+) A F O R	39. Some staff participate in group or individual counseling at work	(+) A F O R
16. I am distressed when patients have major setbacks or die	(-) A F O R	40. I am able to express my real feelings about patients in serious situations	(+) A F O R
17. Patients equipment is maintained for my ready use	(+) A F O R	41. I am able to cope with job distress	(+) A F O R
18. Group or individual counseling is available	(+) A F O R	42. Nurses respect my knowledge	(+) A F O R

to staff at work			
19. Organizing my daily work requires too much time	(+) A F O R	43. A lack of work space distresses me	(+) A F O R
20. I feel confident in my abilities	(+) A F O R	44. Staffing permits me to work a satisfying schedule	(+) A F O R
21. Adequate relief is regularly provided for lunch, coffee break	(+) A F O R	45. I have sufficient preparation to operate the specialized equipment used on units where I work	(+) A F O R
22. I cover my anxiety about a patient with a smile	(+) A F O R	46. I am able to provide the medical care that I want to during the length of my work shift	(+) A F O R
23. My judgments are respected by nurses	(+) A F O R	47. My work schedule is stressful	(+) A F O R
24. I feel like taking a mental health day after a patient does poorly	(+) A F O R	48. I doesn't help to talk over work stresses with my friends outside the health field	(+) A F O R
25. The work won't get done if I don't do it personally	(+) A F O R	49. Staffing allows me to attend continuing education events	(+) A F O R

Appendix 3e
Quality of Care Survey

Below are a number of questions about your or your child's recent emergency department visit. Please answer each question by putting an X in the box provided. Mark one box only for each question. One question asks you to write in your answer. Please, print carefully. Thank you.

Your Health / Your Child's Health

1. What day of the week did you / your child visit the emergency department? ------- [ ] Saturday [ ] Sunday [ ] Monday [ ] Tuesday [ ] Wednesday [ ] Thursday [ ] Friday

2. When did you / your child arrive at the emergency department?---- [ ] Between 7am and 3pm [ ] Between 3pm and 11 pm [ ] Between 11pm and 7am.

3. How has your / your child's health been in the past year?--- [ ] Excellent [ ] Good [ ] Fair [ ] Poor

4. Does your / your child's health insurance company suggest ways to prevent health problems? ----- (Check one box only) [ ] No insurance [ ] Military coverage [ ] No health guidance [ ] Some health guidance

5. What sex are you / your child?----- [ ] Male [ ] Female

6. How old are you / your child?--- [ ] years

7. Check here if someone other than the patient completed this survey------ [ ]

Statement About Your Care

The 12 statements below are about the care you or your child received. The term "caregivers" means all doctors, nurses, and technicians (or "techs") who helped you/your child in the emergency department. Mark your agreement or disagreement with each statement by putting a X in the box.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
During my / my child's stay in emergency department:	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
1. My / my child's care givers were well organized.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2. My/my child's care givers knew what other care givers had done for me.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
3. My / my child's caregivers listened to me.	[]	[]	[]	[]	[]	[]	[]
4. My / my child's care givers were warm and friendly.	[]	[]	[]	[]	[]	[]	[]
5. My / my child's caregivers clearly explained things to me.	[]	[]	[]	[]	[]	[]	[]
6. My / my child's care givers had a plan for my care.	[]	[]	[]	[]	[]	[]	[]
7. My / my child's care givers helped each other.	[]	[]	[]	[]	[]	[]	[]
8. My / my child's care givers took the time to explain things to me.	[]	[]	[]	[]	[]	[]	[]
9. My / my child's care givers treated me with respect.	[]	[]	[]	[]	[]	[]	[]
10. My / my child's care givers responded to my needs quickly.	[]	[]	[]	[]	[]	[]	[]
11. I am satisfied with the care I or my child received.	[]	[]	[]	[]	[]	[]	[]
12. I will recommend this Emergency Department to my friends and family.	[]	[]	[]	[]	[]	[]	[]

Linkage Codes [ ][ ]
(Research use only)

Appendix 3f
Encuesta de la calidad del cuidado médico – Por Pacientes (Versión española)

En la parte inferior están algunas preguntas acerca de su o su niño visita más reciente al departamento de emergencia. Por favor conteste cada pregunta poniendo una X en el paréntesis. Marque un paréntesis solamente por cada pregunta. Una pregunta le pide que escriba su respuesta. Por favor, escriba claro. Gracias.

Usted como el (la) paciente y su Salud

1. ¿Qué día de la semana fue su o su niño visita al departamento de emergencia? ------- [ ] Sábado [ ] Domingo [ ] Lunes
[ ] Martes [ ] Miércoles [ ] Jueves [ ] Viernes

2. ¿Cuándo llego o su niño al departamento de emergencia?---- [ ] Entre 7am y 3 pm [ ] Entre 3pm y 11 pm
[ ] Entre 11pm y 7am

3. ¿Como ha estado su o su niño salud este último año?----[ ] Excelente [ ] Bien [ ] Más o menos [ ] Mal

4. ¿Su o su niño seguro médico le sugiere maneras de prevenir problemas médicos? ----- (Marque un paréntesis solamente)
[ ] No seguro médico [ ] Seguro militar [ ] No guía de salud [ ] Alguna guía de salud.

5. ¿Cuál es el sexo de su o su niño? ---- - [ ] Hombre [ ] Mujer

6. ¿Cuantos años tiene usted o su niño? --- [ ] años

7 Marque aquí si alguna persona diferente al paciente lleno esta encuesta------ [ ]

Preguntas acerca del cuidado médico que recibió

Las doce preguntas son acerca del cuidado médico que recibió. El "cuidado médico" se refiere al cuidado de los doctores, enfermeras, y técnicos (o "techs") quienes cuidaron de usted o su niño en el departamento de emergencia. Marque si esta de acuerdo o en desacuerdo con cada pregunta poniendo una X en el paréntesis.

	Desacuerdo Fuertemente	Desacuerdo Moderadamente	Desacuerdo Un poco	Neutral	de acuerdo Un poco	de acuerdo Moderadamente	de acuerdo Fuertemente
Durante mi/mi niño estancia en el departamento de emergencia:							
1. El personal medico estuvo organizado	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

	Desacuerdo Fuertemente	Desacuerdo Moderadamente	Desacuerdo Un poco	Neutral	de acuerdo Un poco	de acuerdo Moderadamente	de acuerdo Fuertemente
2. Mi o mi niño personal medico sabia lo que el resto del personal había echo por mi.	[]	[]	[]	[]	[]	[]	[]
3. Mi o mi niño personal medico me escucho.	[]	[]	[]	[]	[]	[]	[]
4. Mi o mi niño personal medico fueron amables y amigables	[]	[]	[]	[]	[]	[]	[]
5. Mi o mi niño personal médico me explicaron las cosas claramente .	[]	[]	[]	[]	[]	[]	[]
6. Mi o mi niño personal médico tuvo un plan para mi cuidado	[]	[]	[]	[]	[]	[]	[]
7. Mi o mi niño personal médico se ayudaba mutuamente.	[]	[]	[]	[]	[]	[]	[]
8. Mi o mi niño personal médico se tomo el tiempo para explicarme las cosas.	[]	[]	[]	[]	[]	[]	[]
9. Mi o mi niño personal médico me trato con respeto.	[]	[]	[]	[]	[]	[]	[]
10. Mi personal médico respondió a mis necesidades rápidamente	[]	[]	[]	[]	[]	[]	[]
11. Estoy satisfecho (a) con el cuidado que yo o mi niño he recibido.	[]	[]	[]	[]	[]	[]	[]
12. Recomendaría a mis amistades y familia este departamento de emergencia .	[]	[]	[]	[]	[]	[]	[]

Linkage Codes [][]
(Research use only)

Putting Our Patients First

SAFE Reporting

Patient/Event Information:

1. **Today's Date:** _____ / _____ / _____ (*mm* / *dd* / *yyyy*) **Current Time:** _____ : _____ Military Time *(24 hr clock)* *hr* *min*

2. **Date of Event:** _____ / _____ / _____ (*mm* / *dd* / *yyyy*) **Time of Event:** _____ : _____ Military Time *(24 hr clock)* *hr* *min*

3. **Type of Event** *(Check all that apply)*

Blood Products	Fall	Medication
Behavioral/Psych	IV Complications	Surgery
Equipment/Product	Laboratory	Test, Treatment, Procedure
		Other *(specify)* _____

4. **Please summarize what happened.** What do you think **caused** this event?

_____ _____
_____ _____
_____ _____
_____ What has been done to **address** or **resolve** this matter?
_____ _____
_____ _____

5. **Risk Management Event/Incident form** completed Yes No
If harm occurred, report event to your risk management department

Harm Scale (based on your best knowledge of information available at the time of this report)

6. **Which best describes the event/incident you are reporting?** *(Choose one answer)*
No event occurred, but a **risky situation** was found that increased the risk for an event to occur
An event occurred, but **was caught before** affecting/reaching the patient

An event occurred and reached the patient, but the patient was not harmed

An event occurred, patient was harmed, but harm did not result in death *(circle A or B)*

A. Temporary Harm *(complete recovery expected)* **B. Permanent** Harm *(complete recovery NOT expected)*

An event occurred and resulted in death to the patient

How was the care of the patient affected? (Choose the best answer known at the time of this report)

Life sustaining treatment/intervention *(i.e., intubation, pressor support, CPR)*

Additional medical or surgical treatment *(i.e., medications, surgical interventions)*

Additional testing required *(i.e., lab tests, x-rays)*

An increased level of monitoring or observation *(i.e., increased vital checks)*

Care was not affected

Please Return Card To Nearest SAFE Reporting Mailbox. ***Thank You For Your Participation***

Appendix 3h
Summary of the Literature

Study	Sample Description	Instrument/Design	Keyword	Findings
Nurses' Outcomes - Job Satisfaction				
Kalisch et al. (2010). The impact of unit characteristics, staff characteristics, and teamwork on staff job satisfaction with current position and occupation.	3675 nursing staff from five hospitals and 80 patient care units	A cross-sectional study using Nursing Teamwork Survey		When participants rated their teamwork higher, the level of their satisfaction with current job and occupation were higher ($p < 0.001$)
Manojlovich (2005). Association between practice environment and nurses' job satisfaction with nurse-physician communication.	500 nurses participated in the study.	Survey questionnaire		Structural empowerment and factors in the nurses' work environment with RN-MD communications predicted 61% variance in nurse job satisfaction. Work environment factors and RN-MD communications highly predicted nurse job satisfaction.
Amos, Hu, and Herick (2005). The impact of team-building communication training on communication and nurse job satisfaction.	Sample comprised of 44 RNs	Pre and post-intervention surveys		Staff rated their communication as 98.4% and rated other staff communication skills as 93.5% pre-intervention. At the post-intervention stage, nurses rated their communication skills at 98.9% and rated other staff communication skills at 91.8%. After team-building communication training there was an increase in constructive feedback by 5%. There were improvements in interpersonal interactions and staff turnover decreased from 13.42% pretest to 6.56% posttest.

Study	Sample Description	Instrument /Design	Keyword	Findings
Coeling and Cukr (2000). A study of the effects of nurse-physician communication styles on nurse-physician collaboration (teamwork) care quality, and nurse job satisfaction.	65 nurses participated in the study.	Pre and posttest survey questionnaire	Dominant, contentious, and attentive communication styles	Three styles of communication examined were dominant, contentious, and attentive styles. When physicians used dominant styles the nurses perceived absence of nurse-physician collaboration/teamwork ($t = -5.42$) and care quality ($t = -4.72$); and nurse job satisfaction decreased ($t = -7.30$). Contentious communication by the physicians led the nurses to feel that there was no nurse-physician collaboration ($t = -7.50$), decreased perception of quality care ($t = -5.92$), and decreased nurse job satisfaction, ($t = -9.08$). When physicians communicated in an attentive manner, nurses perceived the presence of collaboration/teamwork ($t = 6.13$); improved care quality ($t = 6.77$); and improved nurse job satisfaction ($t = 7.55$).
Rafferty et al. (2001). Examination of the relationship between interdisciplinary teamwork and nurse autonomy on quality patients' care, patients' outcome, and nurses' job satisfaction.	10,022 staff nurses participated.	Postal survey questionnaire of staff nurses		Perception of the presence of teamwork was dependent on the shift worked: day shift nurses scored 28% and night shift nurses scored 16%. Full time nurses scored 27% and part-time nurses scored 21% on the perception of the presence of teamwork on their units ($p < 0.01$). Teamwork was synergic with autonomy. Nurses who scored lower in autonomy also score lower in teamwork perception and nurses who scored higher in autonomy scored higher in the perception of teamwork ($p < 0.01$). 29% of the RNs rated care quality in their units as excellent; 55% rated it good; and 14% rated care quality fair, post intervention to teamwork.
Adams and Bond (2000). A study to determine relationship between organizational characteristics and nurse job	A randomly selected sample of 834 nurses participated in the study.	Researchers used a survey questionnaire		Cohesion among RNs predicted 0.51 of RN job satisfaction and staff-patient ratio predicted 0.41. Adequate staffing was necessary to maintain group-cohesion and teamwork. Group cohesion enhanced the RNs' interests in assisting colleagues handle stressful patients' issues.

satisfaction.				
Study	**Sample Description**	**Instrument/Design**	**Keyword**	**Findings**
DiMeglio (2005). The effects of team building and collaborative process intervention on group-cohesion, nurse job satisfaction, and nurse turnover.	300 nurses participated in the study	Quasi, interrupted time series experimental design.		Group-cohesion was higher from 5.5, pretest, to 6.01 ($p < 0.001$) on a scale of 1-10 after the intervention. RN-RN interaction improved from a pretest score of 67.80% to a posttest score of 70.79%. RN-MD interaction improved from 58.07 pretest to a posttest score of 58.55 ($p = 0.05$). From the pre to post intervention the following improvements were noted: decision making score, 47.11 to 49.14; perception for professional practice, 65.05% to 66.20% ($p<0.05$); job enjoyment created moderate job satisfaction with mean scores from 51.33% to 56.58% ($p = 0.05$); and turnover also improved from 9% to 6%, a significant reduction of 27%. However, autonomy decreased from 52.98 to 52.70 from pre to posttest ($p = 0.05$).
Shader et al. (2001). RNs and RN managers' job satisfaction, team cohesion, perceived job stress, and expected turnover.	246 participants	A cross-sectional self-reported questionnaire design		The study demonstrated strong association between stress, team-cohesion, job satisfaction, and intent to leave the job. When there was Increased job stress cohesion in the team decreased ($r = -0.41$); RN job satisfaction decreased ($r = 0.51$); RN intent to stay on the job decreased ($r = -0.47$); and RN intent to leave the job increased ($r = 0.37$).
Bratt et al. (2000). The influence of stress and nursing leadership on nurse job satisfaction.	1973 staff nurses participated in the study.	A cross-sectional survey design		There was a negative association ($r = -0.37$ to $r = -0.56$) between job stress, group-cohesion, professional job satisfaction, nurse-physician collaboration (teamwork), and organizational effects on job satisfaction. There was a positive correlation between organizational work satisfaction ($r = 0.35$ to $r = 0.56$) with group cohesion, professional job satisfaction, and nurse-physician collaboration (teamwork) with a predicted value of 52%.

Physicians' Outcomes - Job Satisfaction				
Study	**Sample Description**	**Instrument/Design**	**Keyword**	**Findings**
Baggs et al. (1997). Assessment and comparison of levels of nurse-physician collaboration and satisfaction with the process of decision making and effects of satisfaction on nurse retention.	81 nurses, 23 residents, 37 attending physicians, and 473 transferred patients from SICU; 44 nurses, 51 residents, and 465 transferred patients from MICU; and25 nurses, 45 attending physicians, and 494 transferred patients from the Community Hospital's ICU.	Survey questionnaire	Residents Attending physicians Collaboration	Nurses and physicians were in agreement in reporting moderate amount of RN-MD collaboration within sites except attending physicians from SICU. Physicians were more satisfied with decision making process than the nurses from all sites. Nurses perceived a greater relationship between satisfaction with decision making process as evidence of collaboration than the physicians, however, nurses' satisfaction with decision making did not predict their retention.

Study	Sample Description	Instrument/Design	Keyword	Findings
Gordon et al. (2011). Examined effects of reorganizing physician into unit-based team on ability to identify other care teams, increase physician-nurse face to face communication, greater perception that their patient care needs were met, and decrease in the number of pages to resident physicians.	Convenient sample of resident physicians = 60, nurses = 154.	Prospective intervention study of unit-based teams. Data collected once pre and twice post intervention	Pages; calls to resident physicians through the paging system.	Physicians were able to recognize the nurse caring for the most complex conditions (62.3% vs 82.5% vs 82.5, p = .05); physician-nurse contact increased from 27.3% to 64.9% to 56.9%, p = .01; nurse-physician contact 7.7% to 48.2%, to 55.2%, p = .002; meeting patient concerns improved 44.2% to 82.1% to 81.8% p = .009; number of paging (calls via pagers) per day to resident physicians also decreased from 19 to 10 to 11, (by 42.1%), p < .0001.
Williams et al. (2003). The impact of job satisfaction, job stress, mental and physical health on physicians' intentions to quit practice.	171,000 practicing physicians	Survey questionnaires		Increased stress level was related to job dissatisfaction which led to intention to reduce work hours, leave direct patient care, change specialty, or quit practice.

Study	Sample Description	Instrument/Design	Keyword	Findings
Patient Outcomes – Satisfaction with Care, Safety				
Ernst et al. (2004). A study of factors that determined nurse job satisfaction using exploratory descriptive design.	A convenience sample of 249 nurses.	Exploratory descriptive survey		The nurses reported high job satisfaction and felt that as a result they gave high quality patient care.
Kalisch et al. (2010). The impact of unit characteristics, staff characteristics, and teamwork on staff job satisfaction with current position and occupation.	3675 nursing staff from five hospitals and 80 patient care units	A cross-sectional study using Nursing Teamwork Survey		When participants rated their teamwork higher, the level of their satisfaction with current job and occupation were higher ($p < 0.001$)
Kalisch & Lee (2007). Conducted an intervention study to enhance nursing staff teamwork and engagement and their effects on patient falls, patient hospital length of stay, nurse-physician communication, physician-communication, quality of patient care, perception of teamwork, and staff	32 RNs, 2 LPNs, 15 CNAs, and 6 unit secretaries	A pre-post team cross-sectional training		A one day team interventional training was given to all staff. Patient fall rates mean score dropped from 7.73/1000 patient hospital days to 2.99/1000 patient hospital days post training ($t = 3.98$, $p < 0.001$), promptness in responding to patients' calls increased from 32.0% to 49.0%, communication by the nurse to patients and families increased from 36.7% to 48.0%, quality of care by the nurses to the patient increased from 46.0% to 52.0%, staff perception of the presence of teamwork improved Chi-Square = 36.07, $p = .000$, and turnover rates decreased from 13.14 to 8.05 ($t = 2.18$, $p = .03$, and vacancy rates decreased from 6.14 to 5.23 ($t = 4.55$, $p = .0000$.

burnout.				
Study	**Sample**	**Instrument/Design**	**Keyword**	**Findings**
Heinemann et al. (1996) A study to assess the effects of RN-Partnering intervention with other staff on patients' outcomes.		. Control and intervention groups studied using survey questionnaire in the pre, intermediate and posttest periods.		There was an increase in patient's perception of timeliness of care, posttest (F = 9.832, p = 0.0019). Medication errors and patient falls were lower in the experimental group than in the control group.
Larrabe et al. (2004). A study to measure patient satisfaction, patient health status, patient perceived nurse caring, quality of life.	Convenience samples of patients (n =362) and nurses (n = 90)	Survey questionnaire		Patient perceived nurse caring, patient age, patient quality of life, RN-MD collaboration positively correlated with patient satisfaction ($p < .05$).
Study	Sample	Instrument/Design	Keyword	Findings
Tschannen & Kalisch. (2009). Measured association between nurse-physician collaboration and patient hospital length of stay.	Survey of convenience samples of nurses (n = 135) and patients (n = 310)	Survey Questionnaire		Increased perceptions of nurse-physician collaboration was positively associated with patient expected length of stay (LOS) in the hospital ($P < 0.001$) whereas decreased perception of nurse-physician collaboration was positively associated with longer than expected LOS.

Appendix 4
Results – Participants' Demographics

Employment Status

	Interventional Group	Percent	Missing Data	Percent	Total	Control Group	Percent	Missing Data	Percent	Total
MD	25	13%			191	40	13%			307
RN	166	87%				267	97%			

Gender

	Interventional Group	Percent	Missing Data	Percent	Total	Control Group	Percent	Missing Data	Percent	Total
Male	58	30%	7	4%	191	84	27%	12	4%	307
Female	126	66%				211	69%			

Age of Participants (RN and MD)

	Interventional Group	Missing Data	Mean	Std Dev	Total	Control Group	Missing Data	Mean	Std Dev	Total
	169	22	38	9.67	191	278	29	39	10.61	307

Years in Current Unit

	Interventional Group	Missing Data	Mean	Std Dev	Total	Control Group	Missing Data	Mean	Std Dev	Total
	177	14	6	6	191	287	20	7	6	307

Shift Worked

	Interventional Group	Day Shift	Evening Shift	Night Shift	Missing Data	Total	Control Group	Day Shift	Evening Shift	Night Shift	Missing Data	Total
	183	92	52	39	8	191	281	120	72	89	26	307

Appendix 4a
Results – Participants' Educational Level

Participants' Educational Level										
	Diploma	Associate	BSN	Masters	DO	MD	PhD	Other	Missing Data	Total
Interventional Group	7	62	81	11	0	15	1	3	11	191
Percent	4%	%	42%	6%	0%	8%	1%	2%	5%	100%
Control Group	9	107	121	16	1	35	0	1	17	307
Percent	3%	35%	39%	5%	0%	11%	0%	0%	6%	100%

Appendix 5
Results - Variables

Staff Perception of Teamwork				
	Interventional Group		**Control Group**	
Mean	3.43		3.22	
95%	3.20		3.05	
Std Dev	0.88		0.79	
t Value	2.50			
P-Value	p = 0.006			

Staff Job Satisfaction				
	Interventional Group		**Control Group**	
Mean	3.11		2.88	
95%	2.96		2.77	
Std Dev	0.59		0.53	
t Value	4.40			
P-Value	P < 0.0001			

Appendix 5a
Results - Variables

Job Environment				**Autonomy**		
	Interventional Group		Control Group		**Interventional Group**	**Control Group**
Mean	4.01		3.75		3.27	2.94
95%	3.79		3.59		3.11	2.81
Std Dev	0.86		0.78		0.59	0.61
t Value	3.25				6.24	
P-Value	p = 0.0006				p < 0.0001	
Control Over Practice						
	Interventional Group		**Control Group**			
Mean	3.09		2.86			
95%	2.90		2.73			
Std Dev	0.73		0.64			
t Value	3.27					
P-Value	P < 0.0001					

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