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Investigation into workplace culture for medication error reporting in pharmacy

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Investigation into Workplace Culture for Medication Error Reporting in Pharmacy

by

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Note to Reader

Note to Reader: The research included in this dissertation was conducted at an undisclosed facility in Florida.

Dedication

I can do all things through Christ, who strengthens me. This doctorate is dedicated to my grandmother, the late Ruth Evelyn Hill Bailey. I loved her more than I loved myself. She always said, “No matter what you do, get an education”. God bless her soul because those are the words that fueled my fire. Thank you, Grandmother. This is also dedicated to my husband, Troy Gulley and my children, Ytrenda, Brenda, and Troy Jr. I thank God for humbling me in so many ways and blessing me abundantly.

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ABSTRACT

This study determined impacts on reported medication errors in pharmacy by analyzing the culture in an undisclosed pharmacy in Florida. SPSS Statistical Software was used to determine the relationship between medication errors and workplace culture. Workplace culture was analyzed by distributing a 43-question culture survey to the pharmacists. There were two treatment groups, Control and Intervention, and the culture survey was two-fold, pre-survey and post-survey, utilizing identical questions to note the difference in a comparative analysis. During the pre-survey, the pharmacists in the Intervention Group received an informational sheet which contained information on a non-punitive culture as well as information about the National Practitioner Databank. The data were collected, compiled into an Excel spreadsheet, and statistically analyzed using SPSS to test the effect due to time (pre versus post intervention), treatment group (control versus intervention) and the interaction between time and treatment group. Of primary interest was knowing if the change from pre to post was significantly different for the two treatment groups using a statistical significance of 0.05.

There was a 26.7% increase in the total number of medication errors reported from pre to post survey as compared to the number of reported medication errors for the prior year. It was determined that organizational culture plays a role in the moral make-up of its individuals. Additionally, it was determined that a multi-culture approach was needed to develop a non-punitive culture. Developing a non-punitive culture in pharmacies across the United States is essential to accurate reporting of medication errors.

This study will showcase a few attributes - survey development, culture assessment, and culture development - held by Industrial Engineers. Although this study focuses primarily on pharmacy services, very few healthcare facilities employee industrial engineers. Hopefully, this study will be a gateway for industrial engineers to enter into the healthcare industry.

Chapter 1

Introduction

> In the shame/blame environment, where errors are seen as a form of personal moral failure that shatters the culture of infallibility inculcated in physicians since the first day of professional training, the physician's ultimate fear-"losing face" in front of one's peers.
>
> A. Wu,
> Medical Error: The Second Victim.
> British Medical Journal 320: p726-727, 2000

1.1 Introduction

Medication errors are commonplace in pharmacies in the commercial, military, and community sector. In the past, the reporting of medication errors was limited to the facility in which the error occurred. There were no governing boards to verify the credentials of the pharmacists nor were there any reporting agencies to report the medication errors, and no mandatory reporting laws. However, as medication errors began to get the media attention, agencies that governed patient safety began to emerge. It was not until 1997 when medication errors were specifically addressed when Representative William Coyne (Democrat, Pennsylvania) introduced the Safe Medications Act of 1997 (See Appendix A). This was the first bill that addressed the reporting of medication errors, although it only pertained to the occurrence of death. As an

incentive for reporting the death-related medication error, (1) the healthcare facility avoided a $15,000 fine for each unreported death, and (2) the healthcare facility would continue to receive Medicare and state healthcare payments.

Until recently, the majority of the research focused on the individual that made the error and not the organization. According to a comment made by a pharmacist, pharmacists were considered incompetent and dismissed from employment if the pharmacist had made three medication errors. In other words, if the pharmacist wanted to keep the job, then some action needed to be taken so the employer would not find out. The reluctance to reveal the medical error stems from various motives: loyalty to one's peers, the shame associated with making and admitting a mistake, and fear of reprisal (Haddad, 2001). The fear of retaliation, loyalty and shame are only part of the reluctance to reveal a medical error.

The 2004 Institute of Medicine report notes that nurses are educated to believe that clinical perfection is an attainable goal, and that "good" nurses do not make errors. These same beliefs are echoed throughout the entire medical community. Physicians, pharmacists, optometrists, and all other healthcare professionals are educated to believe that infallible job performance is optional and if they work hard enough, they can achieve it. The 2004 Institute of Medicine report suggests that this fallacy is perpetuated by litigation practices and licensing boards which have unjustly disciplined healthcare professionals who were involved in an error, but found blameless by a number of independent

authoritative bodies (ISMP, February 2005). These actions are typical in a culture where punishment is the solution to a medical error.

Ruth Benedict created a model of the shame culture (See Table 1.1). This model provides some insight into the primary aspect of a punitive system, punishment. A punitive culture is one that supports finger pointing and eventually leads to a punishment. In Benedict's model, punishment is the result of a person believing he/she did something wrong as well as others believing that the person did something wrong. In short, Benedict's model points out the way an individual feels towards something he/she did or did not do, is based solely on the perception of others. This implies the work environment/culture has some bearing on whether or not to admit to wrong-doing. Benedict states, the downside is the license it appears to give to engage in secret wrong-doing (Atherton, 1976). Because of this, numerous medical errors go unreported. Further, the researcher believes if a culture could exist in the healthcare industry where pharmacists were not blamed for the occurrence of a medication error, the pharmacist would be more prone to disclose the medication error.

Table 1.1 Shame-Culture

Shame-Culture	Other People Believe	
I believe	I didn't do it	I did it
I didn't do it	No problem	I am ashamed and dishonored by their belief
I did it	No one knows, so I am not ashamed	I am guilty and punished

1.2 Problem Setup/Definition

Only a few researchers have addressed the issue of medical errors. According to the United States Institute of Medicine (1999), a medical error is defined in the following context: “safety is defined as freedom from accidental injury" and "error is defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim". Medical error awareness dates back to 1976 when the United States House of Representatives’ Subcommittee on Oversight and Investigation of the Committee on Interstate and Foreign Commerce issued its report, “Cost and Quality in Health Care: Unnecessary Surgery.” The House Subcommittee on Oversight and Investigations (as cited in Null, G., Dean, C., Feldman, M., Rasio, D., Smith, D., 2004) estimated that, on a nationwide basis, there were 2.4 million unnecessary surgeries performed annually, resulting in 11,900 deaths. Since then, researchers from the medical industry have written about medical errors and the one thing that is in agreement is that medical errors do occur.

On November 29, 1999 the Institute of Medicine (IOM) issued a report, “To Err is Human: Building A Safer Health System,” stating that medical errors are the 8th leading cause of death in the United States, with as many as 98,000 people dying per year. In all the literature, there appears to be a few gaps in the research of medical errors, which are the driving force behind the direction of this dissertation. The gaps in the research are as follow:

1) The majority of the research focuses on reporting or lack there of. The IOM report recommended the establishment of a nationwide, mandatory public reporting system.
2) The majority of data presented in the literature describes only the issue of medical errors and not why or how they occur.
3) There has been little research into why a clinician opts to hide a medical error. Also, there has been little analysis as to whether the organizational and individual characteristics contribute to the decision to disclose that a medical error occurred or to keep quiet.

Of the total number of deaths reported as stated in the Institution of Medicine report, over 7,000 deaths per year are attributed to medication-related errors. As defined by the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP), a medication error is defined as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.

Because of the questions raised by the gaps in the present literature, this research is designed to investigate the following questions:

1) Can intervention improve company culture?

2) Are low company culture scores associated with a low number of reported errors? A low company culture score means a low representation of that particular culture within the organization. A company could have a high score on one scale as it relates to a particular culture and low score on another scale as it relates to another type of culture. In this dissertation, the individual score is compared to the aggregate response from the survey group. A company having a high score on one scale and a low score on another scale would imply that the culture of that organization resembles that of the highest scale score.
3) Will individuals with greater fear of reporting errors have lower company culture scores on average than individuals with less fear?

The overwhelming number of deaths per year and the gaps in the existing research defines my focus for this dissertation topic. More narrowly put, the purpose of this research is to increase the reporting of medication errors and create a blueprint for an improved workplace culture. Through the use of pharmacists' comments on practice in pharmacy and a detailed survey that asks pertinent questions related to organizational culture and individual moral make-up within that culture, a picture of the pharmacists' work ethics and work culture will be revealed. Both survey and comments will be analyzed to determine if organizational culture and individual moral make-up can contribute to a greater understanding of why a pharmacist opts to hide a medication error.

1.3 Summary of Objectives

The initial motivating factor of this research was to increase medication error reporting. Key milestones to reaching this goal included: (1) determining the current obstacles to increased reporting, (2) developing a survey tool to analyze the pharmacist's workplace culture, (3) recruiting pharmacists to participate in the survey, and (4) comparing reported medication errors (pre and post survey) with the prior year reported medication errors.

The second objective of this research was to determine what entities in a pharmacy system could possibly have an impact on medication safety. Goals in meeting this objective included analyzing all facets of a pharmacy and what role each aspect played. The results of identified pharmacy-related entities are then used to formulate a warning system as to when potential error is on the horizon.

The last objective of this research was to develop a template for the creation of a culture that supports medication error reporting. The following milestones were reached in accomplishing this objective: (1) development of a theoretical model of error, and (2) development of a triple-check system that includes the ordering physician, patient, and pharmacy.

1.4 Chapter Summary: Organization of this Work

This chapter gives a brief discussion on medical errors and how medical errors became the primary focus in the realm of patient safety. This chapter also defines the term, medical error. The current problem under investigation is explained in detail. Further, this chapter identifies the gaps in the research of medical errors and explains the goals of this research.

In Chapter 2, a comprehensive review of literature as it relates to medical errors is unfolded. Public opinion and that of pharmacists are noted on the issue of medication errors. The essence of reporting errors and the ethics associated with disclosure including a legal perspective are discussed. Also in Chapter 2, a thorough analysis of culture to include a formal definition, main characteristics, and its effect on people in the organization is presented.

In Chapter 3, a theoretical model of error in an organization is proposed and discussed. Various types of errors are identified, defined, and discussed. The thought process mode in relation to human task performance is discussed. The discussion of the pharmacy and the pharmacists highlight the working environment and job design. In this chapter, medication errors and causes are identified. Further, the development of the three hypotheses are discussed and outlined.

Chapter 4 presents the methodology behind the creation of the comprehensive survey used in this research to assess pharmacists in an organization. Also, Chapter 4 identifies the six types of cultures and their associated characteristics are discussed. The scale development and sample size justification are presented in this chapter. The statistical methods used to analyze the data is identified and discussed.

A detailed data analysis in relation to the three hypotheses is presented and discussed in Chapter 5. Variations to the statistical methods mentioned in Chapter 4 are identified and discussed. How the survey scale scores were derived is also presented in Chapter 5.

Lastly, Chapter 6 provides a summary of work and conclusions based on the results of Chapter 5. A pathway to a non-punitive culture is identified, presented and discussed. Further, technological insights, recommendations, and further research in the realm of medication errors are discussed.

Chapter 2

Literature Review

2.1 Introduction

The issue of medical errors is not new, but in the past, the problem has not received its deserved attention. Awareness of this issue dates back to 1976 (See Historical Perspective, Appendix A). Research began to emerge quite rapidly and in great abundance on the topic of medical errors in the early 1990s with accomplished research by Lucian Leape, M.D., and David Bates, M.D., and supported by the Agency for Health Care Policy and Research, now the Agency for Healthcare Research and Quality. Most of the research on the issue of medical errors is an offspring of the November 29, 1999 Institute of Medicine report, "To Err is Human: Building A Safer Health System." The report states that medical errors are the 8th leading cause of death in the United States, with as many as 98,000 people dying per year and the estimated medical errors cost the nation, roughly, $37.6 billion each year. Of the 98,000 deaths per year, 7,000 are a result of medication errors.

The report called for mandatory and voluntary medical error reporting (See Summary of Congressional Response, Appendix B). Reporting provides a way to obtain needed information about medical errors. Reporting is essential to holding healthcare systems accountable for delivering quality care and educating

the public about the safety of their healthcare system. Most importantly, reporting is crucial to identifying existing patterns and discovering ways to prevent recurring medical errors whether through surgery or prescription filling.

2.2 Opinion

Since the Institute of Medicine's 1999 report, patient safety has since become a popular topic for journalists, healthcare leaders, medical professionals, Congress and patients. Providing healthcare is a difficult task in itself. Now, add the varying medical professionals that must interact in order to accomplish an overall task of patient wellness. The interaction among varying medical professionals makes providing healthcare not only difficult but complex. Some believe that improvement in medicine and medication safety go hand-in-hand. According to Robert Wachter, an expert on patient safety, medicine and medication safety go in opposite directions. Wachter states that unless there is an investment in safety with the same vigor as investment in medicinal progress, the situation will actually get worse rather than better (Olsen, 2004). However, significant improvements have been made in some healthcare facilities since the Institute of Medicine released the 1999 landmark report. According to a study in The Journal of the American Medical Association, the rate of change has been painstakingly slow, and the death rate has not changed much. In 2003, (as cited in Leape & Berwick, 2005) Joint Commission for Accreditation of Hospital Organization began requiring hospitals to implement 11 safety practices, including improving patient identification, communication, and "surgical site verification" (marking a body part to ensure surgery is performed on the correct

part). Additionally, new residency training hour limitations were reduced to aid in the reduction of errors contributed to fatigue.

2.2.1 Public

As the Institute of Medicine released its 1999 report, (as cited in AHRQ, February 2000) 51% of Americans followed it closely, according to a survey by the Kaiser Family Foundation. A national poll conducted by the National Patient Safety Foundation found that Americans have a very real fear of medical errors. In this survey, (as cited in AHRQ, February 2000) Americans rated the healthcare system as moderately safe (4.9 on a 1 to 7 scale, where 1 is not safe at all and 7 is very safe). The American Society of Health-System Pharmacists (1999) conducted a survey and asked respondents whom they would trust most to explain their medication and it found that:1) 56% of respondents said the doctor; 2) 32% said the pharmacist; and 3) 10% said a nurse. This is evident that doctors, pharmacists, and nurses need to form an alliance for the overall health and wellness of the patient.

Most people believe that medical errors are the result of the failures of individual providers. Likewise, in pharmacy, a medication error is viewed by most people, as the result of the failure of the individual pharmacist. When asked in a survey about possible solutions to medical errors, (as cited in AHRQ, February 2000) 75% of the respondents thought it would be most effective to keep health professionals with bad track records from providing care and 69% thought the problem could be solved through better training of healthcare professionals. According to the Institute for Safe Medication Practice 2001

survey on perceptions of a non-punitive culture, it is suggested that work is needed on all fronts to fully adopt a non-punitive culture (Institute for Safe Medication Practice, September 2001). ISMP FAQ defines a non-punitive environment as a confidential reporting system where everyone understands that errors will not be linked to an individual's performance. ISMP FAQ states in this type of practice environment, it should be easy to report errors, reward error reporting and provide timely feedback to show what is being done to address problems. In the ISMP 2001 survey, it found that 1) approximately 15% believed that a nonpunitive culture excuses poor performance and absolves staff of personal responsibility; 2) twenty-one percent believed that such a culture might increase carelessness as individuals learn they will not be punished for mistakes.

2.2.2 Healthcare

Despite a growing awareness of the system-based causes of errors, many in healthcare are still struggling to come to terms with the role of individual accountability in a non-punitive culture. The researchers blame the complexity of health care systems, a lack of leadership, the reluctance of doctors to admit errors and an insurance reimbursement system that rewards errors — hospitals can bill for additional services needed when patients are injured by mistakes — but often will not pay for practices that reduce those errors (Weise, 2005).

In the event of medication error, pharmacists in conjunction with the Quality Systems team usually conduct the root cause analysis. To effectively use the root cause analysis approach to medication error, all focus must be taken off the pharmacist involved with the error and placed on the system-based

causes of error. The Institute of Medicine 1999 report emphasized that most of the medical errors are system errors. Research has shown that system maintenance and enhancements can improve quality of care as well as reduce the rate of error. Hospitals in the Department of Veterans Affairs use hand-held, wireless computer technology and bar-coding, which has cut overall hospital medication error rates. A 1999 study published in the Journal of the American Medical Association (as cited in AHRQ, February 2000) indicated that including a pharmacist on medical rounds reduced the errors related to medication ordering by 66%. It is apparent that systematic approaches to improving patient care are essential to eliminate frequent errors in medication. Pretending that they do not exist is to put the clinicians' interests above those of the patients who have entrusted their lives to the medical staff (Pietro et.al, March 2000).

In 2001 ISMP asked pharmacists to comment on the new government proposal which would require a bar code on packages of all human drug and biological products beginning in 2003. Most responded, "It's long overdue" (ISMP, March 2002). Even so, some expressed concern about the increased risk of errors with internal repackaging of medications, especially if manufacturers continue their downward trend of unit dose packaging (ISMP, March 2002). In May 2002, over 600 pharmacists responded to an ISMP survey on pharmacy interventions to tell about their experiences with: 1) factors that impede or facilitate pharmacy interventions; 2) the types of interventions currently performed; and 3) how the information is received by physicians, documented and used. When barriers to optimizing a medication safety strategy interfere with

the pharmacist's ability to perform interventions, serious errors may reach the patient (ISMP, June 2002). Lack of technology support, inadequate staffing, and inefficient documentation process were cited in the survey results as the most frequent barriers to pharmacy intervention. Before new technology is introduced in a system, the manpower required to operate it as well as a technology support team should be identified.

2.3 Reporting Errors

The Institute of Medicine report recommends the establishment of a nationwide, mandatory public reporting system. The implementation planned would begin in hospitals and then venture out to encompass all locations where patient care is practiced. To achieve a successful reduction in errors, information on best practices and effective solutions needs to be shared throughout the medical community. One of the reasons that information is not always available is that the current healthcare system has disincentives for sharing information (Eisenberg, 1999). It is thought of as airing dirty laundry and shunned in the medical industry. Eisenberg (1999) believed that the work of the Clinton Administration could help change the culture of secrecy surrounding medical errors into a culture of education and improvement.

The purpose of creating a reporting infrastructure is to help identify where gaps in safety or certain patterns might exist in the health care system (Eisenberg, 2002). Reports would be made to state health departments, applicable national accrediting organizations, and Medicare peer review organizations. Aggregate statistics, without identifiers, would be submitted to the

federal government, and confidentiality and privacy protections would be applied to encourage reporting of errors (United States Congress, 2000). Providers would be called upon to voluntarily report a range of patient safety data, including the events that led to a patient's undesirable outcome or potential undesirable outcome as a direct association with the medical care the patient received.

Critical to the success of any national medical-error reporting system is language that protects reported data from subpoena or legal discovery (American Hospital Association and Joint Commission on Accreditation of Hospital Organizations, 2001). As it stands now, hospitals are supposed to voluntarily notify the Joint Commission on Accreditation of Healthcare Organizations of sentinel events and then complete a root-cause analysis of preceding system failures. Sentinel events are patient-care errors or accidents that lead to patient death or major injury (Moore Jr, 1998). Allowing voluntary reporting, in a shame-blame environment, leads to a low number of reported medical errors.

In order for a medical error reporting system to work, legislation is needed that protects confidentiality of all parties involved in the error including the patient. Patients should have readily available access to information about preventable medical errors that cause serious injury or death, and providers should have protections to encourage reporting which will aid in a speedy elimination of that type of medical error. As cited in Shalgian (2001), reporting systems should facilitate the sharing of patient safety information among healthcare organizations and foster confidential collaboration with other healthcare reporting systems. Confidentiality protections for patients, healthcare

professionals, and healthcare organizations as well as a non-punitive environment that encourages identification of errors (Voelker, 2001) are essential to the ability of any reporting system to learn about errors and effect their reduction (National Coordinating Council for Medication Error Reporting and Prevention, 2003). The correct response is to redesign systems so that errors are acknowledged, detected, intercepted, and mitigated (Pietro et.al., March 2000).

2.4 Ethics

Ethics are rules for behavior, based on beliefs about how things should be. Ethical systems concern the “shoulds” and “should nots” of life, the principles and values on which human relations are based (Mott, 2001). In some situations, a behavior is considered ethical, whereas in what appears to be an identical situation, that particular behavior is considered unethical. Ethical judgment is defined by its community members in expressing moral approval or disapproval. Meriam-Webster Online defines moral as 1) of or relating to principles of right or wrong in behavior; and 2) sanctioned by or operative on one's conscience or ethical judgment. A successful doctor-patient, doctor-pharmacist, and pharmacist-patient relationship should be built upon the already successful relationship between the doctor-pharmacist. The development of these relationships should be built upon what is ethical and morally right, and most importantly, honesty.

Ethics, professional policy and the law suggest that timely and candid disclosure should be standard practice (Hebert, Levin, Robertson, CMAJ 2001).

Candor about error may lessen, rather than increase, the medicolegal liability of the health care professionals and may help to alleviate the patient's concerns (Kraman and Hamm, 1999). It has been suggested by many that guidelines exist for disclosure of a medical error to patients and their families. Revealing medical errors to the public can be a positive experience for the medical community and can promote public confidence in medicine (Pietro, Shyavitz, Smith, Auerbach, 2000).

Disclosure of error, by contrast, is consistent with recent ethical advances in medicine toward more openness with patients and the involvement of patients in their care (Hebert, Levin, Robertson, 2001). The majority of patients and surrogates expect, respect, and reward honesty on the physician's part. In other words, evidence that patients who feel they have been communicated with candidly are more likely to trust than sue the physician (Kraman and Hamm, 1999). Patients are due information about medical errors out of respect for them as human beings as well as out of, what should be paramount, common courtesy. Furthermore, by the principle of justice and/or fairness, when patients are injured, they should be able to seek appropriate restitution. This ethical rationale for disclosure, based on a strong notion of autonomy, goes beyond what the law might require one to do (Hebert, Levin, Robertson, 2001).

When a medical error is not disclosed, those who witness the error must determine whether they should remain silent or reveal the error (Rajendran, 2001). Although the immediate temptation may be to cover up the fact that an error has taken place (Kapp, 2001), indulging that temptation may bring about an

unfavorable outcome in the long run. The reluctance to reveal the medical error stems from various motives: loyalty to one's peers, the shame associated with making—and admitting—a mistake, and fear of reprisal (Haddad, 2001). The need to cover up a medical error is strong, especially when it is believed that the consequences of reporting the error will be detrimental. Weighing the benefits and harm from this perspective, one might conclude that withholding the truth about the error is justified (Haddad, 2001).

Failing to disclose errors to patients undermines public trust in medicine because it potentially involves deception (Bok, 1979). This failure can be seen as an infringement of professional ethics. In this case, there is a lapse in the commitment to act exclusively in the best interest of the patient. Ultimately, patients may be caused preventable harm if they are injured further by the failure to disclose. At its core, concealing a medication error is one of the worst acts that violate a doctor-patient or pharmacist-patient relationship on an ethical level. There is no legal duty to disclose negligence when the disclosure would not improve the likelihood of a good outcome from drug therapy (Pharmacy Law and Management Conference, 2002). Respect to others is demonstrated by being honest, even when it is difficult to do. It shows a sign of integrity and moral behavior, even if it is perceived that a greater good would come from ignoring the error. There are some who interpret the principle of truth-telling to require complete honesty in every case. It is important to note that withholding the truth is a form of deception, hence a lie (Haddad, 2001).

To change the balance of good and harm that result from reporting medical errors, healthcare professionals need to recognize that government entities like Agency for Healthcare Research and Quality or internal review bodies can bring positive outcomes (Haddad, 2001). Agency for Healthcare Research and Quality's mission is to improve the quality, safety, efficiency, and effectiveness of healthcare for all Americans. Further, healthcare professionals need to trust that the good that comes from reporting an error outweighs the negative effects on group loyalty and trust between co-workers that make it possible to provide comprehensive healthcare (Haddad, 2001).

2.5 Eliminating Error

Throughout the pharmacy system, fail-safes should be installed to prevent a medication error from occurring. These fail-safes are sometimes referred to as forcing functions. "Forcing functions" should be integrated to make it impossible to act without meeting a precondition (Leape, 1994). Twelve suggestions have been proposed to assist in the elimination and eradication of medication errors.

1) Automate functions
2) Improve engineering of equipment, tools, instructions, procedures, the work environment, the organizational structure
3) Improve the monitoring of operations to eliminate some of the consequences of errors, even if the errors cannot be reduced
4) Improve feedback of information about errors and their consequences to increase sensitivity to error-generating work habits
5) Improve interface design for pharmacists and machines
6) Increase and/or improve training to assist in awareness of contributory factors of medication errors
7) Standardization of medications
    a) Medication dosage – unit dose system
    b) Times medications are administered
    c) All packaging and labeling

    d) Storage – each unit should be organized similarly to assist nurses who float between units
    e) Predetermined dosing schedules for specific drugs
    f) Preprinted orders
    g) Equipment i.e. IV administration equipment
8) Share responsibility in the medicinal treatment plan
9) Limit number of hours worked in a day and in a week
10) Mandate breaks
11) Mandate light therapy for pharmacists working in non-daylight hours
12) Mandate continuing education training about medication errors

Items 2 through 4 above were suggested by Altman (as cited in DeGreene, 1970). Item 7, standardization of medications was suggested by Medical Mutual. Standardization is needed to ensure that any prescribing clinician can electronically send a prescription to any pharmacy thereby eliminating the risk of misinterpreting what is heard over the phone or what is handwritten on a prescription. In many states, verified electronic signatures are not acceptable, thus prescribers must physically sign each prescription (ISMP, March 2001), which introduces a potential pathway to error. A reduction in medication errors can be obtained if the pharmacy standardizes its processes. Likewise, the pharmaceutical industry must take a stance on medication errors. We (as cited in ISMP, April 2001) have learned much from practitioner reports, including evidence that a large percentage of medication errors are attributable, at least in part, to commercial labeling, packaging, and nomenclature issues. The stance of the pharmaceutical companies should be one of a take charge approach where they collaborate with the medical community and participate in the standardization of drug packages which are imprinted with a unique barcode.

Another recommendation for medication error reduction is continuous quality improvement. When utilizing continuous quality improvement techniques, a systems approach is used to solve problems. Plan-Do-Check-Act are the steps used within continuous quality improvement systems (Value Based Management.net, 2003). These steps require people to think before they act and to meticulously monitor the results. In conjunction with advanced technology in the form of bar-coding and automation, Plan-Do-Check-Act can reduce the amount of medication errors significantly. Separately, Plan-Do-Check-Act, if used attentively and appropriately, can work just as well as being coupled with advanced technology.

2.6 Legal Issues

One of the largest impediments to a vigorous frontal assault on the medical errors issue is the fact that many physicians and other healthcare professionals persist in equating the admission of errors with legal suicide (Kapp, 1997). Error reporting is tied to significant malpractice reforms. Fear of litigation has hindered efforts to identify medical errors as well as a clinician's admittance to involvement in a medical error. The culture of blame (as cited in Cutler and Bocchino, 2000) pervades every aspect of medicine, from affecting patient safety to increasing medical costs by encouraging the practice of defensive medicine. Cutler and Bocchino (2000) stated that we need to enact malpractice reforms applicable to healthcare claims in order to promote a more positive environment for identifying and reporting medical errors. According to Wachter, (as cited in Olsen, 2004) malpractice becomes an easy excuse for why clinicians don't talk to

one another about medical errors. Some medical professionals say that if the malpractice issue could be fixed, the approach to medical errors would be fundamentally different. In order to achieve the open and honest forum necessary for learning from and correcting our mistakes, we may need further protection in law for this process, in the overriding interest of good health (Smeltzer, 1989). In 2003, President Bush was disappointed with the Senate's failure to pass the Medical Liability Bill. The medical liability crisis is driving good doctors out of medicine, and leaving patients in many communities without access to both basic and specialty medical services (Bush, 2003).

Anxieties about adverse legal consequences, in the form of malpractice lawsuits and, especially in the long-term –care arena, of regulatory punishments, generally pervade contemporary healthcare environments (Kapp, 2001). Thus, as a general rule, an error by an employee pharmacist leads to liability of the corporate pharmacy employer and an error by a non-pharmacist clerk working under the supervision of a pharmacist leads to liability of the pharmacist (Pharmacy Law and Management Conference, 2002). Pharmacists and providers are taught the language to use in writing the patient record in order to avoid litigation (Olsen, 2004). Pharmacists have to make certain that patient recordings in patient records can be interpreted in only one way. Pharmacists are taught to avoid words which are vague or have various meanings.

As cited in Phillips, Dovey, Hickner, Graham, Johnson (n.d.) the absence of federal protection for submitted information to patient safety reporting systems discourages the use of such systems, which reduces the opportunity to identify

patterns and implement corrective measures. Information developed in connection with reporting systems should be privileged for purposes of federal and state judicial proceedings, including with respect to discovery, subpoenas, testimony, or any other form of disclosure (Phillips et. al., n.d.). From both a legal and ethical perspective, the physician/patient relationship in the United States at this time is best characterized as fiduciary in nature, built and dependent on the trust that the patient is able to place in the physician (Journal of the American Geriatrics Society, October 2001). This trust is predicated on the patient's assumption that the physician must be guided in practice by the ethical principles of nonmaleficence (avoiding causing harm, or primum non nocere), beneficence (affirmatively doing well), and fidelity (honesty and loyalty) (Kapp, 2001). The main event which triggers malpractice litigation is patient injury (Pharmacy Law and Management Conference, 2002). Many lawsuits begin because a healthcare professional expresses that the end result of another healthcare professional's designated patient therapy was negligent. When seeking compensation for medical errors, litigants primarily state that they hope to prevent further untoward incidents.

A significant external barrier that impedes full implementation of a non-punitive culture is an external legal and regulatory environment that perpetuates an ongoing punitive focus on individuals who make errors (ISMP, February 2005). In the investigation of airline accidents it is not just the pilots that are investigated but the entire crew and all the passengers. The aircraft, the weather, and air traffic systems are also investigated to determine if they played

a role in the accident. Likewise, in healthcare, the entire health delivery system should be investigated. Long-lasting and essential changes can be witnessed when the entire process of the health-delivery system is analyzed just as in the airline industry.

2.7 Making it Worth Disclosing

How a facility deals with a health care error can either exacerbate an already painful incident or, through disclosure, promote openness, healing, learning and prevention (College of Nurses Ontario, 2004). No specific error can be rectified after it has occurred, other than to be open and honest with the patient and seek whatever remedial measures are necessary to treat problems caused by the error (Pharmacy Law and Management Conference, 2002). Colorado's largest malpractice insurer, COPIC, for example, has enrolled 1,800 physicians in a disclosure program under which they immediately express remorse to patients when medical care goes wrong and describe in detail what happened (Kowalczyk, 2005). According to College of Nursing (August 2004), the Institute for Safe Medication Practice Canada lists13 steps involved in best practices in disclosing a healthcare error. The best practice steps are as follow:

1) Have open disclosure policies and procedures in place.
2) Have a key contact person or team ready and available to help staff deal with adverse events.
3) Disclose as soon as possible to the client as soon as she/he is physically and emotionally stable.
4) Choose an appropriate setting that is private and comfortable.
5) Acknowledge that a mistake has been made.
6) Describe the course of events, using lay terms.
7) State the nature of the mistake, the consequences, and the corrective action taken.
8) Express regret and apologize.

9) Elicit questions or concerns and commit to addressing them.
10) Provide follow-up to the client and let him/her know when to expect further information.
11) Provide support and guidance to staff. No one sets out to make medical mistake.
12) Learn what happened with the human-machine interaction in the system of duty performance.
13) Communicate the incident. Sharing a medical mistake with other facilities is a powerful step in the direction of error prevention.

It is of utmost importance that patients get involved in their therapy. It is important for patients to understand, comprehensively, what their treatment plan is as dictated by the doctor and what medications are a part of the treatment plan. According to AHRQ (July 2003), the United States Department of Health and Human Services in conjunction with the American Hospital Association and the American Medical Association developed “Five Steps to Safer Health Care,” for patients to follow. Those five steps are as follow:

1) Ask questions if you have doubts or concerns.
2) Keep and bring a list of ALL the medicines you take.
3) Get the results of any test or procedure.
4) Talk to your doctor about which hospital is best for your health needs.
5) Make sure you understand what will happen if you need surgery.

Another Patient Fact Sheet, “20 Tips to Help Prevent Medical Errors,” was developed by the Agency for Healthcare Research and Quality. These tips range from a patient taking part in every decision about his/her healthcare to asking the doctor if the proposed treatment is based upon the latest scientific evidence. Uninvolved and uninformed patients are less likely to accept the doctor's choice of treatment and less likely to do what they need to do to make the treatment work (AHRQ Publication No. AHRQ 00-P038, February 2000).

2.8 Understanding Culture

The word, culture is derived from the Latin verb colere, which means to cultivate, and draws some of its meaning from this association from the act of tilling soil for harvesting a rich produce (Renard, 2006). Merriam-Webster's dictionary defines culture generally as the integrated pattern of human knowledge, belief, and behavior that depends upon man's capacity for learning and transmitting knowledge to succeeding generations. Schermerhorn's definition of culture is the shared set of beliefs, values, and patterns of behavior common to a group of people (Schermerhorn Jr., 1996). Morasco defines culture as a set of characteristics that sets one group of people apart from another (Morasco, 2002). Although there are many definitions of the word, culture, there are similarities in the meaning.

Culture consists of explicit and implicit patterns of behavior acquired, created and transmitted (Renard, 2006). How a set of abstract principles is translated into day-to-day behavior is defined by its culture (Morasco, 2002). Culture is learned; it is not genetic, just as a person's desire for a cream-cheese bagel and orange juice in the morning is not genetic, but a learned cultural response to morning hunger (Renard, 2006). On the contrary, Morasco believes that people have a set of nearly instinctive default behaviors, programmed into each person from infancy, which represents accepted norms and modes within each person's local environment (Morasco, 2002). Whether learned or instinctive, a person's behavior is driven by three forces: 1) human nature; 2)

culture and; 3) personality (Morasco, 2002). Further, culture is powerful but not immutable template of behavior (The Wharton School, 2004).

2.8.1 Organizational Culture

Just as culture transcends from one person to another in society, it transcends within an organization; hence the term organizational culture, sometimes referred to as corporate culture or company culture. Cultures in organizations are the same as in societies (Nitschke, n.d.) however, in an organization there are two levels of culture, the observable culture and the core culture (Schermerhorn Jr., 1996). Observable culture is what one sees and hears and the core culture is the underlying beliefs that influence behavior and actually give rise to the aspects of observable culture.

There are several definitions of organizational culture in which all have fundamental similarities. Organizational culture as defined by Edgar Schein is a pattern of basic assumption- invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration- that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1990). Organizational culture is the environment in which people work (Hodgetts, 1999). Organizational culture has been defined as a collection of values and norms that are shared by people in an organization and that control the way they interact with each other and with stakeholders outside the organization. Organizational culture is a series of values, standard interpretations, insights and ways of thinking that are shared by

members of an organization and are passed on to new members of the organization (Daft, 2002).

Company culture is a system of shared values, beliefs, behaviors and goals widely accepted by the membership and translated into the way a company treats its employees and internal and external customers (Culture or Reputation, n.d.). Company culture is based on shared values and workplace norms (Rao, 2003). The shared beliefs, from top to bottom, are what the company is doing, what it is offering or providing or what it is manufacturing is of the highest quality (Culture or Reputation, n.d.). Because culture is shared, it can remain influential long after its creator has been forgotten (Deering, Dilts & Russell, 2003). Culture creates vast inertial guidance in all that is done, leading one to repeat readily what has gone before with little concern for why (The Wharton School, 2004). Thus a key aspect of a culture is its ability to pass on knowledge and competence to its members (Deering, Dilts & Russell, 2003).

Corporate culture is that intangible something that influences the environments in which we work every day (Pegasus Communication, 2004). It is the perceived personality of an organization that is determined by the people who form or make up an organization and partly from the reputation it has from the quality of goods or services that it offers (Culture or Reputation, n.d.). Corporate culture thus refers to the emotional climate or personality of the organization (Renard, 2006). An organization's culture refers to unspoken beliefs, values and traditions translated into statements of vision and mission, common to the work force that are expressed in silence and powerful rules, which control and

reinforce the behavior that is encouraged or discouraged in the workplace (Renard, 2006). Corporate culture not only forms the foundation of any business but also should be reflected in the company's mission statement and re-enforced through internal objectives (Culture or Reputation, n.d.).

Culture comprises values, norms, and conventions that people both absorb and recreate as part of the community of people, whether a company, work group, or religious organization (The Wharton School, 2004). Every company and every organization has a culture of sorts and it can be a force for good or for bad depending on its values, the way the corporate leaders determine strategy and direction and how they train their staff to interpret those values (Culture or Reputation, n.d.). Culture has the potential to mold behavior, strengthen common beliefs, and promote members to apply their efforts to accomplish organizational objectives that are viewed as important. Well crafted, it can effectively align thousands of people and decisions; poorly designed, it can misalign an entire organization (The Wharton School, 2004). The challenge of identifying and analyzing company culture lies in its invisibility (Renard, 2006).

2.8.2 Culture Change

Cultures that are developed over the course of years and years of evolution are not changed in the short term nor does change come easily (Nitschke, n.d.). Change happens and most people cannot tell how or when things changed, they just did (Nitschke, n.d.). While changing a company's culture overnight is downright impossible, workplace experts say the first step is to take a close look at the existing culture, define it, and then ask if it has the right

qualities to back up the business goals (Leung, 1997). Cultures can be changed, but it takes recognition, perseverance, time and leadership (Nitschke, n.d.). The truth is that more than 70% of large scale system implementation change efforts fail and of these failures more than 70% are due to culture-related issues: employee resistance to change and unsupportive management behavior (Witt, 2006). Sometimes there are valid reasons for employee skepticism, and that is probably due to ill-conceived plans for change that failed in the past (Nitschke, n.d.).

Cultures are capable of making or breaking an organization if left to their own evolution (Nitschke, n.d.). When leadership is fragmented or inconsistent, when departments degenerate into factions, when gaps emerge between a company's stated purpose and its actual mode of operation, toxic cultures are born (Sea Change, 2003). It is vital that a new hire fits the corporate philosophy, or he stands little chance of long-term success (Rodgers, 2006). From the CEO to the lowest level member of the organization, the hiring process should focus on what the organization needs and whether or not the candidates fully understand that they are there to move the organization forward, not just for their own self interest (Nitschke, n.d.). Reducing turnover starts with commitment from the top, so management philosophy should not only match the corporate climate but should invite others to join in with their best foot forward (Rodgers, 2006). Dysfunctional cultures are simply tough to fix (Witt, 2006). Cultural mismatch is a major reason for employee-employer relationship failure (Rodgers, 2006). Studies show that up to 50% of the typical employee's job satisfaction is

determined by the quality of his relationship with his direct manager (Rodgers, 2006). If there is a high quality relationship between the employee and his direct manager, the employee's job satisfaction will be high and vice-versa.

2.8.3 Strong Culture

Cultures develop and evolve over time through the actions of past leaders, events and circumstances (Nitschke, n.d.). Most cultures evolve unnoticed and untouched by management for two main reasons: 1) organizational leadership is focused on the short-term results of the company, usually quarter over quarter results; and 2) leadership usually comes and goes on a frequent basis (Nitschke, n.d.). The strength of the culture depends on two factors: 1) the degree to which the values of the culture are codified and effectively transmitted to all; and 2) the degree of pain people suffer for straying outside the cultural norms (Morasco, 2002). Strong cultures are believed to exist where members respond to stimulus because of their alignment with the organizational values. CEOs fail to see that employees' actions are often prompted by fear – fear of losing status, fear of losing control, fear of losing their jobs (Sea Change, 2003). It is only when the culture is recognized and understood that managers, at all levels, can proceed with running the business through recruitment and training programs (Culture or Reputation, n.d.).

New employees should be trained in the company culture. Also, decisions on hiring need to be made carefully since people in an organization are the key reasons cultures either are strengthened and reinforced, or, alternatively, weakened and diminished (Rao, 2003). The corporate culture, and the

reputation, is maintained through the recruitment process and thus it is not easy to change strategy, direction or corporate culture over night simply because of intertwining of beliefs and ideals. (Culture or Reputation, n.d.). Morasco believes that the strongest cultures are those in which all members clearly know and understand the code, and also recognize that the penalties for violation are harsh (Morasco, 2002).

The unofficial source of information in a company is called the grapevine. Contrary to Morasco's belief, Seaman suggests (as stated in Sea Change, 2003) "in a healthy culture, senior management can actually learn a lot about what's going on by 'listening in' to the grapevine – inviting people to come forward and talk about what is going on, without fear of censure or retribution." There is genuine conversation – leaders listen to what people say (Deering, Dilts & Russell, 2003). It's a way of identifying significant issues before they get out of hand and cause major employee discontent (Sea Change, 2003). People at all levels are encouraged and supported to speak openly and honestly about what they think (Deering, Dilts & Russell, 2003). As a result, leaders pick up signals that give clues or coming opportunities and hints about emerging threats (Deering, Dilts & Russell, 2003). "When you care about people, they are going to be happier and more efficient at their jobs" (Leung, 1997). If people at the top are open, honest, communicative, and responsive and are aware of moral, social and ethical values, then it is more likely the company will have those same qualities (Culture or Reputation, n.d.). That is because the very qualities

demanded of leaders are the same qualities that go to make up corporate culture (Culture or Reputation, n.d.).

A strong culture can be developed at a company even if employees do not spend their evenings after work together socializing (Rao, 2003). The key to developing a strong culture is to make it relevant to the company's business and to assure that it reinforces the qualities necessary for the company to succeed (Rao, 2003). Those qualities include accountability, teamwork, training, responsibility, integrity, focus, understanding, growth, and ethics (Culture or Reputation, n.d.). A company's culture thrives when there is stable leadership and when senior management and employees share common values and patterns of behavior (Sea Change, 2003). This begins by developing the shared values for the company with the team, (not simply issuing them top-down) and gaining consensus and agreement on what these core principles should be (Rao, 2003). The team must recognize that they are addressing a common goal, and they must be willing and able to work collaboratively together to achieve it (Witt, 2006). A successful company culture requires the existence of a well-defined, structured environment with no ambiguous organization charts (Renard, 2006). Very clear job descriptions and unmistakable lines of reporting provide clarity and maintain the company's stability and continuity (Renard, 2006). Strong cultures are built where there is true alignment between actions that are desired and actions that are rewarded (Rao, 2003). The organization's actions and plans are determined by the desire and efforts of people at all levels of the organization, and the credit for success is spread to many contributors (Deering, Dilts &

Russell, 2003). The only way a company can build a strong corporate culture is by weaving it into the fibers of the company (Rao, 2003). Thus, building a high-performance culture requires extended and consistent investment over several years, but once achieved, the built-in inertial momentum can help sustain high performance for years ahead (The Wharton School, 2004).

2.8.4 Importance of Culture

The 1999 Institute of Medicine report emphasizes of utmost importance, when a medical error occurs, to not place individual blame. Additionally, the report emphasized a dire need for leadership by executive leaders and clinicians as well as holding the board of trustees accountable for patient safety. Prevention and correction of system-based errors should be the only focus of a non-punitive culture, not pointing fingers and placing blame.

The first task is the creation of a blame-free, protected environment that encourages reporting of all medical errors. Fear of reprisals, public castigation, and loss of business will continue to impede the reporting of serious errors unless incentives for making mistakes known to accountable oversight bodies are provided (JCAHO, February 2000). The blame for mislabeling a prescription and the punishment for doing so, outweigh a pharmacist's intent of doing what is right and reportable medication errors are continually driven underground. For a typical caregiver involved in a medical error that leads to a serious adverse event, the incentives to report are all negative - potential job loss, humiliation, and shunning (JCAHO, February 2000). Some positive reinforcement and a

supportive environment that encourages the reporting of a medical error and full disclosure to the patient are warranted in all realms of the medical industry.

President Clinton wanted to replace what some call a culture of silence with a culture of safety, an environment that encourages others to talk about medical errors, what caused them and how to prevent them. According to the United States Department of Veterans Affairs, Frequently Asked Questions, creating a culture of safety means moving beyond a culture of blame to one of "safety mindfulness". Traditionally, the dominant psychological environment of medicine has been a simplistic one of shaming and blaming, and then punishing, individual actors who have been singled out for making mistakes, rather than an environment in which errors are recognized as a complex systemic phenomenon requiring broader solutions (Reinertsen, 2000). In the shame/blame environment, where errors are seen as a form of personal moral failure that shatters the culture of infallibility inculcated in physicians since the first day of professional training, the physician's ultimate fear is "losing face" in front of one's peers (Wu, 2000).

The existing culture of blame and punishment, which suppresses information about errors, must be transformed into a culture of safety that encourages information sharing (American Medical Association, 2000). Hoping to foster organization cultures that promote error reduction efforts, the Joint Commission has designed its policies not to penalize the accreditation status of an organization that surfaces an error and performs the appropriate due diligence required under the policy. The resulting atmosphere provides incentives that

favor the surfacing of information about errors which contributes to error reduction strategies that can be used by other organizations (JCAHO, February 2000).

2.9 Industry Leaders

When it comes to medical error reporting, the federal government has been leading by example. The Department of Veterans Affairs and Department of Defense have been frontiers in the use of automated and other systems to reduce medical errors. According to the United States Department of Veterans Affairs National Center for Patient Safety (n.d.), the Veterans Health Administration has two systems – internal and external- in place for reporting medical errors. According to the Veterans Administration, both systems are confidential and non-punitive. However, the external system is voluntary and the internal system is mandatory for death and serious injuries.

Using the expertise of the National Aeronautics and Space Administration, the Veterans Administration developed an internal reporting system, the Patient Safety Information System, called SPOT (U.S. Veterans Affairs National Center for Patient Safety FAQ). This system identifies weaknesses in the system of providing care rather than attempting to define how many errors occur in a given amount of time. SPOT has been pilot tested in Veterans Administration's Veterans' Integrated Services Network 8 which encompasses the state of Florida and the most southern part of Georgia. The external system is called the Patient Safety Reporting System. This system was developed by a collaborated effort between Veterans Health Administration and the National Aeronautics and

Space Administration. According to U.S. Veterans Affairs National Center for Patient Safety FAQ (n.d.), only National Aeronautics and Space Administration personnel assigned to the reporting system can review data until the de-identification process is complete.

The Veterans Administration completed implementation of an automated order entry system in all its healthcare facilities, along with a bar-coding system for medication administration in 2000. Because people on the frontline are usually in the best position to identify issues and solutions, Root Cause Analysis teams at each of the Veteran Administration healthcare facilities formulate solutions, test, implement, and measure outcomes in order to improve patient safety. Findings from the teams are shared nation-wide as cited by the United States Department of Veterans Administration in “Culture Change: Prevention, Not Punishment”. As a result of such findings, Veterans Administration increased patient safety training for staff from 15 to 20 hours a year.

In spring 2000, all 500 Department of Defense hospitals and clinics implemented a mandatory reporting system (Clinton-Gore Administration, 2000). Department of Defense implemented a new computerized medical record that makes pertinent clinical information on a patient available when and where it is needed. Further, the Department of Defense launched an integrated pharmacy system for over 8 million of their beneficiaries. This new system allows Department of Defense’s physicians to precisely track prescriptions as they are filled in public and private pharmacies worldwide thereby, alleviating drug-drug interactions and/or adverse events.

There have been others that contributed to the foothold on medication errors. In private industry and non-punitive medication error reporting, the Oklahoma State Board of Health leads the way. In 2001, Oklahoma became the first state to grant legal protection to the United States Pharmacopeia (2001) – Institute for Safe Medication Practices (USP-ISMP). Oklahoma regards submitted reports as privileged communications and bans their use in legal proceedings. The ability to report medication errors without fear of retribution should help healthcare providers identify trends and implement system-wide safety measures to prevent future errors (Cohen, 2001).

2.10 Chapter Summary

A major effect of the 1999 Institute of Medicine report was that it helped to enlist a diversified variety of stake-holders to advance the patient safety cause. In 2001, Congress responded to the Institute of Medicine recommendations by appropriating $50 million annually for patient safety research to the Agency for Healthcare Research and Quality in order to further understand when, how, and under what circumstances errors occur; identify the causes of errors; develop tools, data, and research needed to foster a national strategy to improve patient safety; and work with public and private partners to apply evidence-based approaches to the improvement of patient safety. The lead federal agency charged with supporting research designed to improve the quality of health care, reduce its cost, improve patient safety, address medical errors, and broaden access to essential services (United States Congress Subcommittee on Health of the Committee on Energy and Commerce House of Representatives, 2002). The

most important stake-holders are the physicians, nurses, therapists, and pharmacists who have become much more alert to safety hazards and who are committed to making improvements on the front lines (Leape and Berwick, 2005).

In 1999 the Institute of Medicine committee asked the Food and Drug Administration to: 1) develop and enforce standards for the design of drug packaging and labeling to maximize safety; 2) require pharmaceutical testing of proposed drug names; and 3) establish an appropriate response to problems identified through post-marketing surveillance, especially those that are perceived to require immediate response to protect the safety of patients.

The Institute for Safe Medication Practice (March, 2002) conducted a survey on drug companies providing fewer unit dose packaged medications. It is clear from the survey that, despite some initial worry about costs, many hospitals are ready to do their part to move patient medication-technology forward. The survey results indicated that almost two-thirds of respondents would be less likely to purchase a product if it were not available in unit dose packaging (ISMP, March 2002). The pharmaceutical industry must now join the battle of medication error prevention and produce all products in unit dose packages with a uniform bar code.

As of 2004, there has not been any new labeling or packaging guidance documents; pharmaceutical companies are not required to test proposed drug names and packaging; a standard process for this testing has not been established; and at times, FDA response to problems uncovered through reporting programs is slow or non-existent (ISMP, November 2004).

While the 1999 Institute of Medicine report, “To Err Is Human”, has not yet succeeded in creating comprehensive, nationwide how-to steps for improvements in patient safety, it has made a profound impact on individual and organizational attitudes. The 1999 Institute of Medicine report has changed the way healthcare professionals think and talk about medical errors. A central concept of the report—that bad systems and not bad people lead to most errors—has since become a mantra in healthcare (Leape and Berwick, 2005). A 2004 Institute of Medicine report, “Keeping Patients Safe: Transforming the Work Environment of Nurses,” suggests that a persistent professional culture that fosters unrealistic expectations of clinical perfection is an external barrier that seriously impedes full implementation of a non-punitive, just culture of safety (ISMP, February 2005).

Chapter 3

Theoretical Development

3.1 Introduction

As was stated in the literature review of medical errors, the theory proposed and tested by this research will primarily reflect the relationship between the culture and the pharmacist's decision to hide or come forth in the discovery of a medication error. The model will propose an intervention process that attempts to explain some of the difference in human behavior in an organization by cultural characteristics and individual moral make-up. The purpose of this research is not to identify the process, but to identify the types of culture in conjunction with one's moral values that may account for the difference in decision making.

Because complete disclosure of a medication error does not occur most of the time, the research will be of necessity, an assessment of organizational culture and individual moral make-up. This model is designed to explain why some pharmacists choose to reveal (report) that a medication error did occur while others in what appears to be the same situation choose to remain silent (not report).

A theoretical model of error in the organization is proposed in Figure 3.1. An incident is an occurrence of an action or situation that is a separate unit

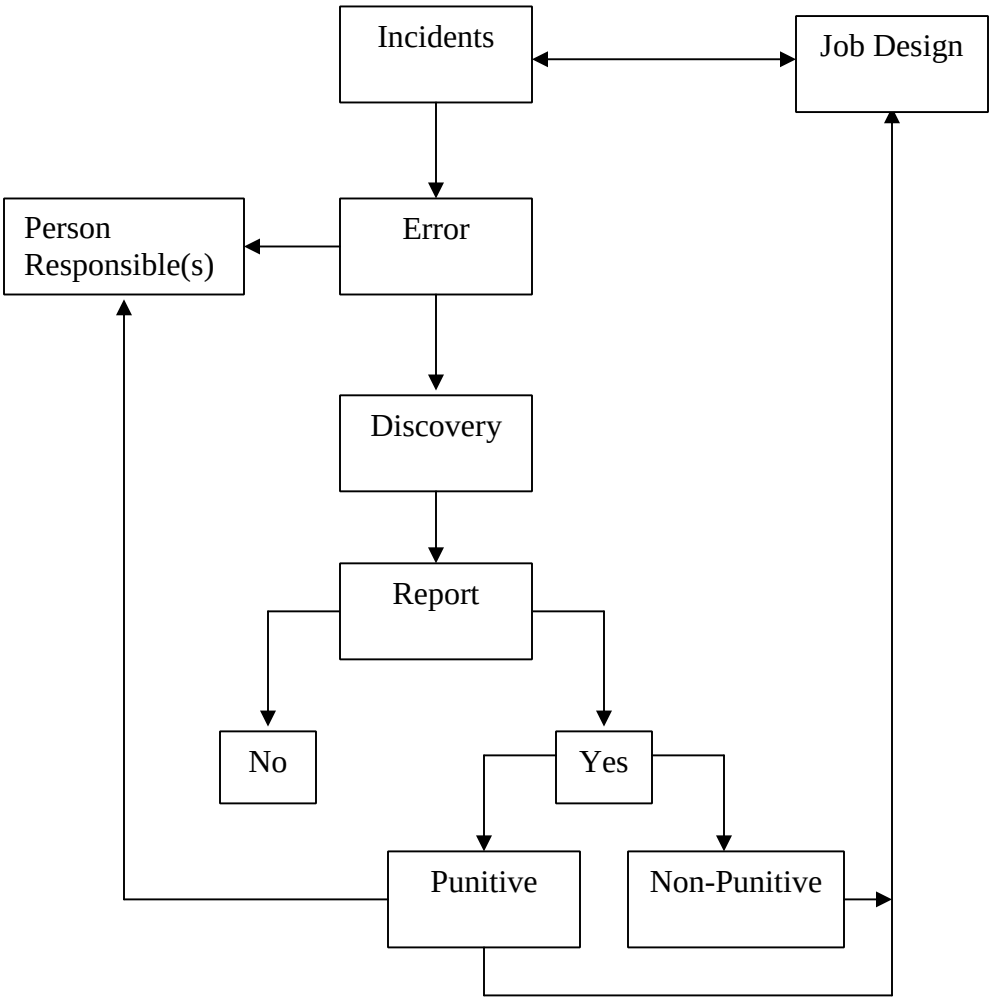

Figure 3.1 Theoretical Model

of experience occurring in the organization. The incident may be as simple as a phone ringing or a colleague interrupting to ask a question. However, the incident is a direct reflection on job design. The incident, if not handled in accordance with job design, results in an error. This compromise on job design could be as complicated as giving Jane Doe (2 years of age) a medication that was meant for Jane Doe (82 years of age). In the military, for example, personnel error can be defined as any deviation from established procedure. This may imply punitive measures and assumes all error would be eliminated by "following the checklist" or "following procedures" (DeGreene, 1970). In these type-thinking organizations, there is a person(s) responsible as dictated in a punitive environment. In these instances, the event is the discovery of an error rather than the discovery of a flaw in the system. It now becomes the individual's decision to report or not report the error.

3.2 Defining Error and Its Classifications

Error is defined as an unintentional mistake (MSN Encarta, 2006). To be considered an error, an aspect of human behavior must potentially have a degradative effect on system performance (Degreene, 1970). In general, all errors can be termed either active or latent. An active error is one whose effect is immediate. For instance, jumping out of an airplane without a parachute has an immediate effect. Either you splash into the water or you hit the ground. Active failures have an underlying history that extends back in time and up through the levels of the system. Latent errors are those errors whose effects are delayed - the proverbial "accident waiting to happen" (Reason, 1990). In the parachute

example, perhaps the sky diver strapped his look-a-like knapsack on his back thinking it was his parachute sack. As a result, every time the sky diver needs to make a jump, the potential for disaster is high. Latent errors arise from decisions made by designers, builders, policy makers, procedure writers, and top-level management. For example, top level management says that one pharmacist can only be on the clock during an eight hour shift, otherwise the pharmacist that works beyond eight hours in one day will be written up. A medication error becomes more likely as the pharmacist is approaching the end of his/her eight hour shift as work is sped up to complete necessary prescriptions before the shift ends.

James Reason developed the Swiss cheese model of how defenses, barriers, and safeguards may be penetrated by an accident trajectory. The holes in the Swiss cheese model are analogous to the holes in the defenses, barriers, and safeguards of a system. The holes arise for two reasons: active failures and latent conditions. Latent conditions have two kinds of adverse effects: error provoking conditions (time pressure, understaffing, fatigue, etc.) and long-lasting holes (untrustworthy alarms and indicators, unworkable procedures, etc.) in the defenses (Reason, 2000). Latent conditions can be identified and remedied well in advance of the occurrence of an adverse event. Knowing and understanding that remedial action aids in the prevention of error can lead to proactive risk management. Once errors are understood, steps to prevent them can be developed.

A number of classification schemes have been developed to categorize human errors. For example, Kirwan (1994) identifies four types of errors, including (1) errors of commission, in which incorrect actions were taken, (2) errors of omission, in which required actions were not taken, (3) extraneous acts, in which an action that was not required was taken, and (4) error-recovery opportunities, comprised of actions which can recover previous errors. Errors have been classified into categories such as failure to follow procedures, incorrect diagnosis, using poor judgment, misinterpretation of communications, and insufficient attention or caution (DeGreene, 1970). Other schemes divide errors into motor and cognitive categories while some divide errors into technical or intellectual errors (PharmCon, n.d.).

In pharmacies, a technical error is one that generally occurs as a result of a pharmacist having performed a function incorrectly; for example, the dispensing of a drug in the wrong strength. In an article published by PharmCon, Inc, “Medication Error Reduction Perspectives From Two States With Legal Case Analysis”, an intellectual error is one that usually occurs as a result of a pharmacist having failed to recognize, and acted to prevent, a problem with drug therapy; for example, the failure to warn or to detect duplicative therapy or failing to properly counsel.

3.3 Thought Process Mode

Cognitive psychology is the study of higher mental processes such as attention, language use, memory, perception, problem solving, and thinking

(American Psychological Association, 2002). Simply put, cognitive psychology is the study of how people think. Cognitive scientists have attempted to understand and model cognitive abilities such as perception, learning, language, memory, and problem solving. Cognitive psychologists and human-factors specialists have been studying how and why people make errors for many years. Cognitive psychologists determined that human beings operate in an automatic mode and problem-solving mode.

In automatic mode, human beings perform processes that do not require attention and can often be performed along with other tasks without interference. For example, in automatic mode, human beings can hold a conversation while tying a shoe. In this mode, the actions are unconscious and effortless and once we have a task "down," it becomes a part of automatic mode thinking (Leape, 1994). The mind switches to problem-solving mode when a problem surfaces. The problem-solving mode involves thinking that is directed toward solving specific problems and that moves from an initial state to a goal state by means of a set of mental operations (APA, 2002). Errors that occur in the problem-solving mode might occur when the wrong rule is chosen, either because the situation was miscalculated or the rule was misapplied. Factors that affect the functioning in problem-solving mode are pattern matching, biased memory, the availability heuristic, confirmation bias, and overconfidence, filling-in the gaps of knowledge (Leape, 1994). An example of pattern matching is when a pharmacist has to fill a prescription for 0.1 milligrams of levothyroxine for Patient A and a prescription for 1.0 milligrams of levothyroxine for Patient B. The pharmacist relies on previous

thought out solutions from filling Patient A's prescription as the pharmacist fills Patient B's prescription. An example of bias memory is when a pharmacist fills 10 prescriptions of 0.1 milligrams of levothyroxine on a daily basis and one day he is to fill a prescription for 1.0 milligrams of levothyroxine. Because of the familiarity of filling the prescription for 0.1 milligrams of levothyroxine, the pharmacist over-generalizes when he fills the prescription for 1.0 milligrams of levothyroxine. An example of availability heuristic is, if the pharmacist filled the 1.0 milligrams of levothyroxine with 0.1 milligrams of levothyroxine because that was the first information to come to mind. An example of confirmation bias is when a pharmacist receives current documented evidence that 0.1 milligrams of levothyroxine has no therapeutic value and continues to prescribe the 0.1 milligrams of levothyroxine because of a decade-old, supported hypothesis that 0.1 milligrams of levothyroxine has been shown to increase the functioning of the thyroid in 95% of the subjects tested. Further, an example of over-confidence is when the pharmacist believes that his/her actions to continually prescribe 0.1 milligrams of levothyroxine are justified and the pharmacist is in favor of all evidence that supports his/her course of action. While operating in the problem-solving mode, the result is a delay in the algorithm for problem-solving processes.

Like the cognitive psychologists, human factors specialists are concerned with understanding the interactions between human beings and systems. According to the Human Factors and Ergonomics Society (2005), the human factors profession applies theory, principles, data, and other methods to design

systems that will optimize human well-being and overall system performance. Human Factors and Ergonomics at San Jose State University, defines the specialty of human factors specialists to include improving the operability, maintainability, usability, comfort, safety and health characteristics of systems to improve the human and system effectiveness and to reduce the potential of injury and error.

3.4 Beginning of an Error

Human errors begin during the design stage, extending beyond process and workplace design into construction and continuing into the design of management systems for operations and maintenance (Process Improvement Institute, 2005). These systems include management and training policies and procedural development and standard operating procedure development. Faulty procedures may be the actual cause of an error that initially appears to be the result of inattention (Pharmacy Law and Management Conference, 2002). There is seldom a single reason that an error occurs. A large number of factors, broad in range, can be attributed to a single error. Usually, a chain of events that has gone undetected and unnoticed by a system leads to a recurring safety problem. Most pharmacy errors result from problems created by today's complex healthcare system.

It is impossible to practice any profession without occasionally making a mistake (Pharmacy Law and Management Conference, 2002). The right conditions, at the right time, can lead to a mistake by anyone. Typically,

mistakes become a concern only when a person is injured. To prevent the mistake from occurring again, punishment is usually the preferred solution.

3.5 Pharmacists and the Pharmacy

The practice of pharmacy is a vital part of total health care. The basic value of medicinal treatment to patients in the United States is evidenced by the increased therapeutic use of prescriptions. In 2004, there was an average number of 63,500 prescriptions dispensed annually per community pharmacy (PR Newswire Association LLC., 2006). With a total of 24,500 community pharmacies, community pharmacists dispense approximately 1.6 billion prescriptions annually (PR Newswire Association LLC., 2006). Annually, a total of 1.3 million Americans experience a medication mixup (CNN, 2005). Pharmacists dispense medications prescribed by physicians, dentists, and other authorized medical practitioners. According to Florida Health Careers, most pharmacists work about 43 hours per week. Earnings are high, but some pharmacists work long hours, nights, weekends, and holidays (Bureau of Labor and Statistics, 2006). Long working hours and overtime contribute to increased worker fatigue and safety problems (Dawson et al, 2004). The long hours and nights could potentially give rise to fatigue and result in a medication error.

The role of the pharmacist has radically changed over time. According to an article by Academy of Managed Care Pharmacy: “Pharmacists’ Cognitive Services”, it has shifted from one of “product dispenser” to one of “medication therapy expert” on a healthcare team. According to American Pharmacists Association Foundation (n.d.), pharmacists are trained to understand the

composition of drugs, including their chemical, biological, and physical properties. By understanding the composition of drugs and how they work in the body, pharmacists can identify medication interactions. Pharmacists must understand the use, clinical effects, and composition of drugs, including their chemical, biological, and physical properties (Bureau of Labor Statistics, 2006). In McKee vs. American Home Products, Corp: A review of case law from reported judicial opinions discloses that the trend is toward recognition of responsibilities by pharmacists to both accurately process prescription orders and also competently monitor drug therapy (Pharmacy Law and Management Conference, 2002). Pharmacists must exercise skill and care in the realm of duty performance, so as to prevent undesirable effects from dispensed medications. Skill refers to the ability to produce good results, and care refers to the effort one expends in producing good results (Leape, 1994).

For the pharmacist, job design is an intricate part of his/her job. Pharmacy is usually practiced in a very public area with many distractions and interferences having the potential to divert attention from the task of processing prescriptions and providing pharmaceutical care services for patients (Pharmacy Law and Management Conference, 2002). The challenges facing those who design pharmacy systems that take into account the interaction of man and machine, are many, varied, and complex. Quantitative information about human performance, including error performance, is necessary for realistic system planning, functions allocation, equipment design, selection, training, and

evaluation (Degreene, 1970). If done correctly and integrated with properly designed equipment and ideal facility layout, errors will be few and far between.

3.5.1 Errors in Pharmacy

Medication errors tend to fall into three categories: prescribing, dispensing and administering medicines (Cousins, 2005). A prescribing error involves incorrectly entering the prescription. Examples of prescribing errors are wrong dose, wrong drug, illegible hand-writing on a written prescription, and incorrect use of a prescribed drug. A dispensing error involves wrong drug, wrong patient, mislabeling of prescription, and wrong dose. An administering error involves drug omission, wrong drug given to patient, and incorrect route of entry. There are four types of events that are associated with each category of medication errors: 1) adverse event – unintended incidents in care that may result in undesirable outcomes and may require additional care; 2) near miss – events in which unwanted consequences were prevented; 3) sentinel event - event in which death or serious harm to a patient has occurred; and 4) no harm event - an event that has actually occurred (no recovery action was taken) but where no actual harm has come to the patient or the organization. The causes of these medication errors are complex in nature being that it is seldom a single error that causes the mistake. Often, there are some underlying systemic issues that compromise the quality of the healthcare delivery system.

3.5.2 Causes of Medication Errors

Lucian Leape, M.D., identified a number of “proximal causes” to medication error. Proximal causes are defined as the apparent 'reason' the error

was made (Leape et. al., 1995). Sometimes there is more than one proximal cause associated with a medication error. Proximal causes are expansive categories where the underlying system problems that result in medication errors may be found. Proximal causes as identified by Leape et. al. (1995) include the following: lack of knowledge of the drug, lack of information about the patient, violations of rules, slips and memory lapses, transcription errors, faulty identity checking, faulty interaction with other services, faulty dose checking, infusion pump and parenteral delivery problems, inadequate monitoring, drug stocking and delivery problems, preparation errors, lack of standardization. The Institute for Safe Medication Practices (March 2001) identifies the main cause to medication error as failed communication. Other causes as identified by ISMP (March 2001) include the following:

1) Failed Communication: this category includes the six broad categories:
    a) Handwriting and oral communications, especially over the telephone
    b) Drugs with similar names
    c) Missing or misplaced zeroes and decimal points
    d) Confusion between metric and apothecary systems of measure
    e) Use of non-standard abbreviations
    f) Ambiguous or incomplete orders
2) Poor Drug Distribution Practices
3) Complex or poorly designed technology
4) Access to drugs by non-pharmacy personnel
5) Workplace environmental problems that lead to increased job stress
6) Dose Miscalculations
7) Problems Related to Drugs and Drug Devices
8) Labeling and packaging problems
9) Drug delivery device design flaws
10) Incorrect Drug Administration
11) Lack of Patient Information
12) Lack of information on the patient's disease state or condition
13) Lack of information on changes in a patient's therapy

Because causes of medication error are an intricate part of this dissertation, all causes of medication errors as defined by Institute on Safe Medication Practices have been included in the above list.

Two major categories of factors that influence error are physiological and psychological (Leape 1994). Physiological factors include fatigue, sleep deprivation, drugs, alcohol, and sickness. Psychological factors include distraction due to other activity, as well as emotional states such as boredom, anger, fear, and anxiety. Psychological factors can be triggered by external factors such as overwork, interpersonal relations, and other forms of stress (Leape, 1994). In the airline industry, as analogous to the medical industry, fatigue is noted as the primary adverse physiological factor that is associated with the occurrence of airline accidents.

3.5.3 System Practice in Pharmacy

It is important that with any activity in which safety matters, that activity should be done purposefully, according to a system, in which each specific action is understood to cause a specific result, and changes can be made in the system to improve results (Pharmacy Law and Management Conference, 2002). A system can be defined as "an interdependent group of items, people, or processes with a common purpose" (Langley, Nolan K, Nolan T, 1992). Most pharmacists develop a system of their own for processing prescription orders, and it is important that this individual system be compatible with the system developed by the employer (Pharmacy Law and Management Conference, 2002). Systems that rely on error-free performance are doomed to failure

(Leape, 1994). An effective and efficient system can avert pharmacy errors and create a fail-safe system environment that absorbs error in pharmacy.

When an error occurs, the most common reaction is to find someone to blame. In reality, most medication errors are due in large part to multiple contributing factors that cut across numerous lines of responsibility, technical, procedural, and managerial, all which are inclusive of a system. Medication use systems are complex and the dispensing of one prescription, or the administration of even one dose of a medication, involves from 10 to 15 steps, of which each step offers a potential pathway to error. According to Academy of Managed Care Pharmacy: Frequently Asked Questions, each system involved in each of the 10 to 15 steps, such as computer systems, dispensing devices or drug delivery devices, are potential sources of error. Preventing errors and improving safety for patients require system modifications to rid the system of factors that contribute to medication errors. Safe medication practice is about minimizing the risk of patient safety incidents involving medicines (Cousins, 2005), not blaming individuals. There exists no recorded data that validates medical errors being reduced as a result of blaming an individual.

3.6 Development of Hypotheses

A set of three hypotheses regarding the nature of organizational characteristics and individuality have been developed and are presented in Table 3.1. The first and second hypotheses are concerned with the characteristics of the organization while the third hypothesis investigates the relationship between the individual and the organizational culture.

3.6.1 Organizational Characteristics

Organizational culture is the shared set of beliefs, values, and patterns of behavior common to a group of people (Schermerhorn Jr., 1996). The term corporate culture and workplace culture are often used synonymously with organizational culture. Simply put, organizational culture is the environment in which people work. In an organization, the likelihood to shape attitudes and behavior exists and members are encouraged to apply their efforts to accomplish important organizational goals. It is very important to mention that there are two levels of culture, the observable culture and the core culture. Observable culture is what the workplace environment looks like and what it sounds like. The core culture consists of the fundamental beliefs that manipulate behavior and give rise to the aspects of observable culture.

Hypothesis 1 states that intervention will improve company culture. Intervention can come in many forms. Intervention can be a new process for filling prescriptions, a new piece of equipment, an alarm installed as a fail-safe, an external audit of the pharmacy, a workflow analysis, distribution of a pharmacy-related information sheet or a survey of the organizational culture. For example, a new process for filling a prescription could be a triple check on prescription verification. A new piece of equipment could be an automated pharmaceutical dispenser. An alarm could be installed within the electronic prescription verification system to notify the pharmacist of a mix-match. External audit of the pharmacy could be performed by a non-affiliated entity outside of the organization. A workflow analysis could be performed to assess the functionality

of the workflow. The distribution of an information worksheet could serve as an eye opener for pharmacy related issues. A survey could serve as an assessment of issues related to pharmacy and serve as an opportunity to gain members' perspective on dealings associated with pharmacy. In short, these interventions are all considered as a type of defense that can be interjected into the organization at anytime. Defenses, barriers, and safeguards occupy a key position in the system approach (Reason, 2000). Some technological systems have varying layers of defenses built into their organization. The installation of these interventions can be accomplished by an industrial engineer as well as a human-factors specialist. In a nutshell, industrial engineers deal with work design and productivity. Industrial engineers are capable of designing work and creating policies and procedures that are conducive to a safe work environment and healthy culture while maximizing productivity. Like industrial engineers, human-factors specialists deal with the applied science of workplace equipment design with the intent to maximize productivity by reducing operator fatigue and discomfort which can cause errors.

As stated previously, it is important that with any activity in which safety matters, that activity should be done purposefully, according to a system, in which each specific action is understood to cause a specific result, and changes can be made in the system to improve results (Pharmacy Law and Management Conference, 2002). Further, if we acknowledge the potential causal role of culture in the success or failure of organization change, then it makes sense to develop strategies for examining and redesigning cultural systems as an

integrated aspect of change management (Dooley, n.d.). Therefore, it seems plausible that intervention may improve organizational culture. Change is eminent for every type of culture as the world advances, technologically.

The chosen intervention applied to this research is a cultural assessment survey as well as pharmacy related informational sheets. These tools served the purpose of an organizational development comprehensive intervention. Organizational Development comprehensive interventions are used to directly create change throughout an entire organization (Gale, 2006). The reasoning behind the use of a survey for the chosen intervention was to assess pharmacy related issues and to gain the members' perspective of their work environment. The pharmacy related issues were in reference to medication errors, reporting medication errors, patient safety, job task performance, relationships within the work place, customer concerns, and management within pharmacy. Hence, an evaluation of the culture is the only way to know if the culture is having an impact on medication errors.

The use of the Non-Punitive Information sheet was to serve as an eye-opener to the pharmacists. It was intended to serve as information and inform the pharmacists that such a culture does exist. Further, it was intended to serve as a stimulation tool for pharmacists to begin to report all medication errors regardless of the severity.

The National Practitioner Data Bank sheet was to serve as a source of truthful information in relation to the functioning of the National Practitioner Data Bank. An anonymous pharmacist said, "the National Practioner Data Bank

serves as a lynching mob for any medical personnel that makes an error." The researcher thought that that attitude may have an impact on reporting medication errors. Thus, an information sheet with specific information about the National Practitioner Data Bank was included as part of the intervention.

A comprehensive and systematic data collection strategy was used to identify organizational attitudes and individual moral make-up. The data was then analyzed for results (Chapter 5) and a plan of constructive action was made (Chapter 6).

Table 3.1 Hypotheses

Hypothesis Number	Hypothesis
1	Intervention will improve company culture.
2	Low company culture scores are associated with a low number of reported errors.
3	Individuals with a greater fear of reporting errors versus the average score will have lower company culture scores on average than individuals with less fear.

3.6.2 Error and Environment

The problem of error induced by work environment is admittedly a complicated task. Error itself is a complicated issue when looking at the bigger picture, inclusive of the environment. The workplace environment, commonly referred to as organizational culture, produces behavior amongst its employees' that govern the employees actions to certain situations that arise in the workplace. The National Coordinating Council for Medication Error Reporting and Prevention (Council) has taken the position that differences in culture and in defining a medication error may give rise to the varying number of medication errors reported. Hypothesis 2 states that low company culture scores will be associated with a low number of reported errors. As discussed in Chapter 1, a low company culture score means a low representation of that particular culture within the organization. A company could have a high score on one scale as it relates to a particular culture and low score on another scale as it relates to another type of culture. In this dissertation, the individual score is compared to the aggregate response from the survey group. A company having a high score on one scale and a low score on another scale would imply that the culture of that organization resembles that culture associated with the highest scale score. On the contrary, a company having a low score would less likely resemble that particular culture.

Historically, measurement efforts have focused on practitioner reporting of medication errors, which, at best, uncovers just a fraction of the errors, most of them harmless (ISMP, March 2006). It is estimated that incident reports identify

only 2% to 5% of reportable adverse drug events (AMCP, n.d.). Therefore, it seems plausible that a low company culture score will be associated with a low number of reported errors. If a pharmacist does not believe that the company will support him/her in reporting a medication error, it is likely that the pharmacist does not believe in the company culture and will exhibit a low company culture score in relation to the culture in which he/she works. Without a detailed analysis of mishaps, incidents, near misses, and "free lessons," we have no way of uncovering recurrent error traps or of knowing where the "edge" is until we fall off the cliff (Reason, 2000). It is imperative that healthcare organizations encourage all medication error reporting.

Gross and Ayres' analyses of accident data across industries (as cited in Barnes, 2000) show that human error plays a causal or contributing role in 50-80% of significant accidents. Human error is widely acknowledged as the major cause of quality, production, and safety risks in many industries (Process Improvement Institute, 2005). The most commonly designated cause of accidents is human error (DeGreene, 1970). Based on human nature, human error is certain and will surface in every part of the process life cycle. Although it is unlikely that human error will ever be completely prevented, there is growing recognition that many human performance problems stem from a failure within organizations to develop an effective policy for managing human reliability (Process Improvement Institute, 2005). Human reliability identifies the likelihood and consequences of human error. As defined by Meister (as cited in DeGreene, 1970), human reliability is "the probability that a task will be successfully

performed at any required stage of system operation within a criterion time period". As long as fail-safes are installed within a system, human reliability will always be high.

In the system approach, according to Reason (as cited in Wholey, Moscovice, Hietpas, Holtzman, 2003), errors are seen as consequences rather than causes, having their origins not so much in the perversity of human nature as in "upstream" systemic factors. Systemic factors include frequent and reappearing error traps in the workplace and the organizational processes that transport them through the system. Processes are generally not well-protected from human errors since many safeguards are focused on equipment failure (Primatech, 2006).

3.7 The Problem

Professionals are trained to believe that perfect performance is not only expected, it is also achievable (Leape, 1994). Often in the public eye, physicians are expected to perform their tasks flawlessly as infallible performers, and any error that occurs is often seen as a failure of character more than anything else (Felciano, 1995). Medical professionals are trained to become experts in their field. As defined by Webster's Ninth New Collegiate Dictionary, an expert is one with the special skill or knowledge representing mastery of a particular subject. That definition does not mention infallible. Psychologists would call this a false belief because the reality is that regardless of how skilled, and careful, human beings will make errors.

There have been numerous causes linked to errors in the pharmacy. Some of the causes are as follow: shortage of pharmacist and pharmacy technicians; unrealistic workloads; lack of a double-check system; and high frequency of replacement of brand name with many different generic name drugs. In a survey conducted by Pharmacy Today (as cited in Parker and Waichman, 2005) pharmacists were asked, "What could cause dispensing errors?" Of 187 responses from 171 pharmacists and 16 pharmacy paraprofessionals, insufficient filling time and too many distractions were identified as two of the major areas of concern (Parker and Waichman, 2005). In a study of 500 pharmacist malpractice claims conducted by Pharmacists Mutual Insurance Company, the following types of errors were identified: wrong drug dispensed 52%, wrong strength dispensed 27%, wrong directions given 7.4%, for a total of 86.4% of errors that could have been prevented (Parker and Waichman, 2005).

3.8 The Reality

When an error is discovered, most often through a complaint, there are three options that a healthcare facility can exercise in response to the medication error: admit it, deny it or ignore it. Generally, if the healthcare facility admits that an error occurred, the complaint is resolved quickly and at the least possible cost. Colorado's largest malpractice insurer, COPIC, has enrolled 1,800 physicians in a disclosure program in which they immediately express remorse to patients when medical care goes wrong and describe in detail what happened. Since 2000, COPIC has reimbursed more than 400 patients an average of

$5,300 each for bad medical outcomes, or a total of about $2 million (Kowalczyk, 2005). If the complaint is denied, it could potentially cost the healthcare facility a great deal of money. As stated by Jerome Buckley (as cited in Kowalczyk, 2005) the cost of settling the doctors' claims has dropped by 23%. If the complaint is ignored and the healthcare facility is found liable, the cost to the healthcare facility could be astronomical. Another example as stated by Richard Boothman (as cited in Kowalczyk, 2005) states that the University of Michigan Health System has cut claims in half and reduced settlements to $1.25 million from $3 million a year since developing a disclosure policy in 2002.

There are several reasons that many believe the error rate to be higher than actually reported in the United States. Due to the punitive nature of most healthcare systems, effective reporting is stifled. Because of the extreme sensitivity to legal impact of error, physicians are often unwilling to openly discuss slips or mistakes they make in an effort to analyze what systemic influences may have brought on these errors (Felciano, 2005). Exposure to liability for order processing errors is of great concern to pharmacists because error correction is typically punishment in the form of malpractice tort litigation (Felciano, 2005). As Troyen Brennan, author of "Practice Guidelines and Malpractice Litigation: Collision or Cohesion?" noted, one of the reasons that the error rate is high is because promoting safety is primitive, based on the myth that the way to eliminate errors is to perform perfectly, but human beings are incapable of sustained perfect performance. Brennan concluded that fear of punishment for performance errors inhibits error reporting. Although it is

reasonable to expect an employer to take seriously every pharmacy error, and to seek means of improvement to prevent future errors, it is unreasonable to expect an employer to discharge a pharmacist from employment simply for having made an error (Pharmacy Law and Management Conference, 2002). Pharmacists are all human and all humans make mistakes. Hypothesis 3 states that individuals with greater fear of reporting errors will have lower company culture scores on average than individuals with less fear.

The current system of error prevention focuses on blame and accountability. The public seeks out someone to blame; the legal system seeks out someone to pay, usually the one with the deepest pockets. Pharmacist malpractice falls into the same category as medical malpractice, in the respect that if pharmacists and pharmacy technicians fail to treat the patient with a reasonable degree of skill and care, they are guilty of medical malpractice just the same as a doctor, nurse or other health care provider (Reich and Binstock, n.d.).

The culture of blame that exists in many healthcare systems creates strong pressure on individuals to cover up mistakes rather than admit them (AMCP FAQ, n.d.). The threat of malpractice litigation provides an additional incentive to keep silent. Considering the problem of medical errors as the responsibility of individuals who are inseparable parts of systems has a better potential for focusing on accountability without blame and on consequences without necessitating that they "suffer" the consequences (McKereghan, 2003). Therefore, it seems plausible that individuals with greater fear of reporting errors

versus the average score will have lower company culture scores on average than individuals with less fear.

3.8.1 Report or Remain Silent

When an error occurs, it may be discovered immediately or it could possibly have a latent effect. Upon discovery of the error, comes the decision to report or not report the error. The nature of the situation does indeed have some bearing on the behavior of the participants (Callahan, 1989). After all, behavior patterns, beliefs, moral values, laws and traditions are the defining features of a culture. Sometimes the self-serving nature of the situation plays an important role in an individual's decision to speak up or to remain silent. Before the decision to reveal that one was involved in a medication error, an event or series of events must take place in order to trigger the decision making process (Callahan, 1989). These series of events are related to the culture as well as the individual moral make-up. These events determine if a person is going to report the medication error or remain silent.

3.9 Theory Summary

Although a punitive response may be appropriate in some cases, it is not an effective way to prevent errors from recurring as well as promoting error reporting within the organization. Healthcare systems must establish a non-punitive environment and system for reporting errors within their organization. Trust is an essential piece of a reporting culture. Pharmacists must trust that they will not be fired. They must trust that they will not be blamed. They must trust that the organization really wants the pharmacist to reveal the medication

error. They must trust that the organization stands completely and supportively behind the pharmacist. They must trust that the safest procedures are protocol in the pharmacist's duties. Engineering a just culture is an essential early step in creating a safe culture (Reason, 2000). Although normative in nature, healthcare organizations should provide or be provided resources to encourage error reporting and to implement methods to alleviate errors. Healthcare facilities should have procedures to identify and improve vulnerable parts of a system prior to an error reaching the patient.

Developing a system to mitigate medication errors in pharmacy is a priority in itself. The priority is a life saving event. In order to develop a system to alleviate the number of medication errors, this study will ascertain the validity of the following hypotheses: 1) Intervention will improve company culture; 2) Low company culture scores are associated with a low number of reported errors; and 3) Individuals with a greater fear of reporting errors versus the average score will have lower company culture scores on average than individuals with less fear.

Chapter 4

Methodology

4.1 Introduction

In order to study the phenomenon of medication errors in pharmacy, a prospective multi-method approach has been implemented. Because of the inaccurate total of medication errors in the United States, it would be ideal to study a pharmacist at work. None the less, this approach was not conducive to a safe work environment as an observer becomes an added distraction in the already busy work environment of a pharmacist. As stated in Chapter 4, Theoretical Development, distractions were a primary cause of medication error. The phenomenon of medication errors is complex in nature, therefore this research chose a multi-analysis survey approach to analyze the pharmacist's perceived workplace culture and moral make-up. This survey was developed in an attempt to address some of the shortcomings of being an actual observer of pharmacists at work.

4.2 Survey Development

The survey for this study was developed using the Corporate Culture survey (Corporate Survey, n.d.) developed by Connect2 Corporation (See Appendix C), as a foundation. The first step in building upon the existing culture survey was to determine if there were additional characteristics of a workplace

culture that influence behavior at work, in this instance, pharmacist's behavior at work. Having the privilege to attend pharmacy meetings, the researcher noted that some of the pharmacists had innovative ideas as to the structure of work and how it should be performed. Others expressed operating more efficiently while maintaining quality, with specific regard to pharmacy layout and order processing. Others spoke of integrity and doing what is right. Based upon the pharmacists' comments additional cultures, as listed, emerged: 1) Integrity/Humanistic; 2) Efficiency/Quality; and 3) Innovative. These were cultures other than those cultures outlined in the Corporate Culture survey. The following cultures were outlined in the Corporate Culture survey: 1) Deliberative/Traditional; 2) Established/Stable; and 3) Urgent/Seat of the Pants. The additional cultures as well as moral implications associated with the members of the culture emerged. The factors/characteristics that formed the bases for each culture are outlined in Table 4.1. In many situations, culture has a powerful influence on the moral order of an organization. Generally, people from the same type of culture have more or less identical realities and ways of thinking (Maiese, 2003). These identical realities and mindsets are what contribute to the attributes of the moral make-up of a person belonging to a certain type of organizational culture. The individual moral make-up in the cultures studied is deduced from the trait characteristics that make up the culture (See Appendix E). Table 4.2 lists the cultures studied and the corresponding question numbers from the culture assessment survey.

4.2.1 Integrity/Humanistic Culture

Organizational Integrity is a complex of virtues working together to form a coherent character: a hopeful, identifiable, and purposeful community where trust abounds (Ethics and Policy Integration Centre, 2003). Merriam-Webster Online Dictionary describes integrity as a firm adherence to a code of especially moral or artistic values. Integrity often refers to a refusal to engage in lying, blaming, or other behavior generally seeming to evade accountability which aims at the discovery of some truth. Integrity is synonymous with honesty, hence the measured paradigm. Critics argue that honesty tests measure many things unrelated to honesty: fearfulness, traditionalism, street-wiseness, admission of human frailty (Strategic Dimensions, n.d.). Although the issue of medication error is one that is fearful in itself, particularly to a pharmacist, the issue of integrity must be addressed. At the end of the work day, do we ask the pharmacist to have a seat and strap him/her to a lie detector and ask questions? As the questions are being asked, do we inject the pharmacist and monitor his eye movement and body language to detect truth telling? The inaccurate low number of medication errors reported suggests that there is an integrity issue at stake in pharmacy, hence the interest in integrity testing.

There are ways to objectively and effectively measure integrity. The key step is to identify integrity-based behavior in pharmacy. Behavior indicative of integrity in pharmacy could be a pharmacist telling a patient that he/she has been wrongly filling a prescription for a period of time or a pharmacist openly sharing a

Table 4.1 Culture Characteristics

CULTURE	CHARACTERISTICS
Integrity/Humanistic	• This culture tends to be an honest entity • People in this type of organization consider integrity to be at the top of the list • The organization likely encourages a nurturing environment • Upper-level management communicates clearly and frequently to employees
Efficiency/Quality-oriented Culture	• This culture tends to be quality oriented • People in this type of organization tend to be hard workers • The organization likely has many informal systems that allow the employee to do what he/she needs to do to get the job done • Upper-level management communicates priorities frequently to employees
Innovative Culture	• This culture tends to be innovative • People in this type of organization often consider issues carefully prior to making suggestions and/or solutions • The organization likely has many formal systems that allow the employee to feel empowered and to communicate ideas • This cultural type regularly hires groups of new employees that are thinkers and doers • Upper-level management communicates frequently to employees • Employees communicate frequently
Deliberative Culture	• This culture tends to be intellectual and thoughtful • People in this type of organization often consider issues carefully prior to making a change • The organization likely has many formal systems, yet flexibly forms and reforms teams in accordance with immediate client needs • This cultural type regularly hires groups of new employees, generating a valuable flow of diverse talent with fresh perspectives • Senior management communicates frequently to employees
Established/Stable Culture	• This organization has most likely been around for a long time and/or is a family business. These organizations tend to have solid institutional memories, so they are likely not to waste resources by repeatedly "reinventing the wheel" • This type of company has processes in place to address most situations • Organizations of this type tend to cultivate employees by encouraging development through mentoring programs and/or formal training opportunities • This culture type is known for compensating its people relatively well

Table 4.1 (Continued)

Urgent/Seat of the Pants Culture	• This culture type features a positive work environment, with tight bonds among employees • It is likely that an aspect of this organization's mission includes responding to crisis. People care deeply about the firm's mission and work hard to achieve the organization's goals • Employees who frequently hurry to beat the clock can create great results in a short time, provided that quality is a strong value in the organization • These organizations tend to have a flat structure that fosters communication and collaboration among employees and speeds the decision-making process

Table 4.2 Cultures Studied and Corresponding Question Numbers

Culture Studied	Corresponding Question Numbers
Integrity	2 – 13
Efficiency/Quality	14 – 19
Innovative	20 – 25
Deliberative/Traditional	26 – 30
Established/Stable	31 – 35
Urgent/Seat of the Pants	36 – 43

medication error with his/her colleagues. Integrity means that it is not what is said, but what is done. Likewise, ethics is not about what we say or what we intend, it's about what we do (Scribbler's Ink, 2005). Remember the old adage, "actions speak louder than words." Integrity encompasses ethical behavior, truthfulness, moral values, trustworthiness, and compassion as a

measure of one's general character. Integrity is the purposeful, knowledgeable, trusting exercise of authority in service to a broader community (Ethics and Policy Integration Centre, 2003).

The purpose of organizational ethics is to guide the design and development of structures and systems to evolve toward organizational integrity (Ethics and Policy Integration Centre, 2003). An organization with organizational integrity is a community that has many of the characteristics of a tribe (Ethics and Policy Integration Centre, 2003). Integrity is the strength, unity, clarity and purpose that upholds and sustains all of the activities of the enterprise (Bracher, n.d.). The characteristics of an organization exhibiting integrity according to Ethics and Policy Integration Center are as follow: 1) core beliefs; 2) inward motivation towards growth; 3) stability in leadership; 4) intense sense of loyalty and devotion in support of the core beliefs.

According to Bracher, there are eight attributes of an integrity-centered company: 1) character; 2) honesty; 3) openness; 4) authority; 5) partnership; 6) performance; 7) charity; and 8) graciousness. Character is demonstrated by the organization following through on statements made in the organization. Honesty is demonstrated through truthful communication. Openness is demonstrated through sharing appropriate information. Authority is demonstrated through employee empowerment. Partnership is demonstrated through organizational commitment to fulfill obligations. Performance is demonstrated through accountability throughout the entire organization from the ground-floor up. Charity is demonstrated through generous public service throughout the

community. Graciousness is demonstrated when the organization respects both the employee and the customer. The gist of an integrity based organization is one that is honest, nurturing, and communicates openly, clearly, and frequently to its employees. Employees tend to get self-satisfaction from performing their job. They are very knowledgeable in their field, love every aspect of their job and get a high sense of honor when asked to explain a job-related function.

The culture assessment survey questions that pertain to an integrity/humanistic culture are Questions 2 through 13. Through the use of deductive reasoning based upon the previous paragraphs in this section, the following statements are applicable to the moral implications of individuals in this culture. 1) Individuals are people with a strong sense of honesty; 2) These individuals are aware of the governing boards for their profession; 3) These individuals believe in doing what is right and supports full disclosure of the medical errors; and 4) These individuals believe in telling the truth, regardless of how difficult it may be.

4.2.2 Efficiency/Quality Oriented Culture

Efficiencies are defined as reforms that 1) reduce resources (eg, people or assets), while maintaining the same level of service provision; 2) result in additional outputs, such as enhanced quality or quantity of service, for the same resources; 3) remodel service provision to enable better outcomes (IDeA, n.d.). Quality Culture Changer uses the knowledge of mistake attributes and human behavior to create cultural changes essential in promoting error-proofing. Easy to learn and use, these principles help organization leaders recognize why most

quality initiatives are destined to fail before they begin. Identifying and avoiding actions that reward or punish mistakes removes key barriers to error-proofing.

According to Woods (1996), author of The Six Values of a Quality Culture, there are six values intrinsic to a quality culture. Those six values are: 1) We're all in this together company; 2) No subordinates or superiors allowed; 3) Open, honest communication is vital; 4) Everyone has access to all the information they need; 5) Focus on processes; 6) There are no successes or failures, just learning experiences. These six values work together to form an efficient culture.

The culture assessment survey questions that pertain to the efficiency/quality oriented culture are Questions 14 through 19. The following statements about individual moral make-up characteristics were derived through deductive reasoning by use of the above information: 1) These individuals want to produce a high quality product in the form of wellness for the patient; 2) These individuals in this culture want fast results without compromising quality; 3) These individuals create an efficient way of doing business; 4) These individuals will be truthful because they do not want to compromise quality. Any untruthfulness will make their system unbalanced and quality will be compromised.

4.2.3 Innovative Culture

Organizations with innovative cultures establish excellent working relationships at every level of the organization. Employees tend to feel happy, motivated, and fulfilled. Channels of communication are established among employees, middle management and senior management (IES Consulting, n.d.). The employees welcome, share, and appreciate each other's ideas.

Communication channels are open, upward and downward (Corporate Survey, n.d.). Employees tend to be loyal, productive, and have excellent rapport with the customers. These organizations have a crystal clear vision that is shared by every member of the organization. Members fathom how their role plays a part in the organization's ability to accomplish its goals. This is crucial to its success.

Key elements of an innovative culture include: 1) a fear free workplace to tryout new ideas and take risks; 2) open communication; 3) resources in the form of time, money and people; 4) mutual support from colleagues and management; 5) praise for success and failure. In a culture of openness, intelligent risk taking is encouraged and intelligent failure is perceived as an opportunity for learning (IES Consulting, n.d.). Mistakes are dealt with constructively and good work/behavior is effectively rewarded (Corporate Survey, n.d.). Happy accidents – good things happening by accident - and unexpected surprises are encouraged through creativity. Creativity necessarily involves the destruction of old - and sometimes comfortable and perfectly good - ways of doing business (Schuler, 2002). In an innovative culture, creativity and quality exceeds quantity in terms of value.

It appears that fostering innovation requires the proper mix of structure and flexibility (Runyon, 2005). More flexibility and less structure aids in the creation of an environment that is conducive to fostering an innovative culture. The strength and success of these organizations can be attributed to: 1) open and candid dialogue between employees and management; 2) win-win based

solutions for all stakeholders and 3) employee-employer desire to want the other to succeed.

The culture assessment survey questions that pertain to the innovative culture are Questions 20 through 25. The following statements about individual moral make-up characteristics were derived through deductive reasoning by use of the above information: 1) The moral implications of individuals in this culture are caring, sharing, and confident; 2) These individuals care about patient safety; 3) They are confident and do not feel ashamed about reporting/sharing a medication error; and 4) These individuals are creative, which is a characteristic of innovative, and they are capable of telling the truth in many ways without fully disclosing the whole truth.

4.2.4 Deliberative/Traditional Culture

According to www.webster.com, tradition is defined as an inherited, established, or customary pattern of thought, action, or behavior as a social custom. Further, it states that tradition is the handing down of information, beliefs, and customs by word of mouth or by example from one generation to another without written instruction. An organization that has a traditional culture has a top-down style of bureaucratic management. The organization seldom rewards achievement, but often reprimands for errors. This negative reward system leads members to shift responsibility to others to avoid being blamed (Corporate Survey, n.d.). Organizations that have a traditional culture have some cult-like characteristics. Members feel like they should be in accord with,

gain the approval of, and be liked by others. Members are expected to conform, follow the rules, and make a good impression (Corporate Survey, n.d.).

According to the authors of “What Is Your Corporate Culture?”, a workplace that has a traditional culture tends to be intellectual and thoughtful (McGinty and Moss, 2001). The employees in the traditional culture think about issues carefully before reaching a decision, hence the word deliberate. The Business Edge (n.d.) states that a deliberate culture begins with an overall mission that defines the firm’s central focus and a vision of what the company wants to become. In a deliberative/traditional culture, the actions are intentional, purposeful, and deliberate. The rules are made to be followed and any disregard for the rules implies negligence and disrespect for the organization.

The culture assessment survey questions that pertain to the deliberative/traditional culture are Questions 26 through 30. The following statements about individual moral make-up characteristics were derived through deductive reasoning by use of the above information: 1) Individuals in this culture care about their jobs and understand how each task in doing his/her job is purposeful in producing a desired outcome; 2) These individuals are detail-oriented, knowledgeable, and well-rounded, as they socialize with people of diverse professional backgrounds; and 3) These individuals will tell the truth as long as it is in the best interest of the company. Otherwise, silence may be the chosen alternative.

4.2.5 Established/Stable Culture

In the past, the behavior, beliefs, and environment of a stable culture were equally supportive. The beliefs support the behaviors, the behaviors fit comfortably into the environment, and this in turn helps to reinforce the beliefs (Gilman, 1997). Merriam-Webster Online defines stable as firmly established and designed so as to develop forces that restore the original condition when disturbed from a condition of equilibrium or steady motion. The latter part of this definition – develop forces that restore the original condition - is what prompted a change in the direction of two of the questions (Question 31 and 34) asked in the survey as opposed to the questions (Question 6 and 9) asked in the "What is Your Corporate Culture?" survey. In a stable culture, the response to employees not getting along and customer concerns are pre-scripted and timely. In other words, when employees are not getting along, the supervisor checks the company protocol and that is what is delegated to the employees. Likewise, when customers have concerns, the company follows protocol in a speedy resolution to the problem. These stable cultures want their organization to be undisturbed and have installed pre-scripted measures to address issues that cause a fluctuation in their system of doing things. These cultures are established and have an attitude of "if it ain't broke, don't fix it." An organization with a stable culture resists change. If the level of stress in this culture grows to a noticeable level that imbalances the stability of the organizational culture, it is difficult for the organization to return to the stableness.

The culture assessment survey questions that pertain to the established/stable culture are Questions 31 through 35. The following statements about individual moral make-up characteristics were derived through deductive reasoning by use of the above information: 1) The individuals maintain a balanced work life and are content in the work environment; 2) These individuals do not like change or conflict and as a result, these individuals follow protocol on every issue that arises; 3) They find peace in a stable environment. 4) They are likely to bend the truth so as to not upset the balance of the workplace. They will adjust the truth so that it fits nicely into one of the "if this happens, then do this" procedures; and 5) They feel comfortable knowing that a protocol exists for every issue.

4.2.6 Urgent/Seat of the Pants Culture

Gandhi (as quoted in the 2005, August article published in Executive Coaching and Change Management, "What's Important Isn't Necessarily Urgent") says, "if you want the world to be filled with hyper-efficient robots, obsessively focused on getting their own tasks done at the expense of others' progress, never veering off to look at a friend's new project, or to answer a colleague's question, then by all means, please be that sort of person." The article also states that the term urgency suggests a ruthlessly businesslike approach to time management. This approach to time management is considered flying by the seat of the pants. According to Edge/Schneider Consulting Group, people began "flying by the seat of their pants" about 100 years ago. If quality is deeply instilled within the workplace culture, employees

who rush to beat the deadline can obtain great results. For time management tasks the quality of the output will often relate to the amount of input into the project.

The culture assessment survey questions that pertain to the urgent/seat of the pants culture are Questions 36 through 43. The following statements about individual moral make-up characteristics were derived through deductive reasoning by use of the above information: 1) These individuals feel competent at performing their duties; 2) They are often driven by money. However, if the price is right, they will stay with the employer for a long time; and 3) These individuals are more than likely to not tell the truth. These individuals are in a hurry and will undoubtedly say what is needed in order to complete a task.

4.3 Scale Development

Scales were developed for this study using the Corporate Culture survey, developed by Connect2 Corporation, as a foundation. Using the factors discussed in each culture type from Section 4.2.1 through 4.2.6 above, a list of measures for which scales were developed is listed in Table 4.3. Item pools for each scale were developed to fit a pharmaceutical work environment as suggested by several pharmacists. A high score would represent a high level of the paradigm as a low score would be representative of a low level of the paradigm. As with every culture, there are advantages and disadvantages commonly referred to as pitfalls, which formed the basis for the data assessment measures (Appendix D). The data assessment measures for the

Deliberative/Traditional, Established/Stable, and Urgent/Seat of the Pants cultures were developed by Connect2 Corporation.

Table 4.3 List of Measures

SCALE NUMBER	MEASURE	PARADIGM	SURVEY QUESTION NUMBER
1	Integrity	Personal honesty/morals	2 - 13
2	Efficiency/quality	Personally rewarding	14 - 19
3	Innovativeness	Idea-driven; win/win	20 – 25
4	Traditional	Company honesty	26 – 30
5	Stableness	If it ain't broke don't fix it	31 -35
6	Urgency	It's due yesterday	36 - 43

4.4 Pilot Test

The initial items were piloted on 10 pharmacists. The subjects were given a brief introduction to the study and asked to complete and critique the questionnaire. All surveys were administered on an individual basis. In all cases, the time needed to complete the battery was less than 15 minutes. After the data were collected, an item analysis was conducted and the items were revised (See Appendix E). The subjects for this study are pharmacists at an undisclosed facility in Florida. Subject participation in this study is completely voluntary.

4.5 Sample Size Justification

The sample size and power calculations are carried out using the PASS 2002 software (PASS 2002 Release: May 2, 2002, NCSS Statistical Software,

Kaysville, Utah). The sample size was chosen based on the detection of a statistically significant difference in the primary outcome measures of the primary aim of the study. These measures are the six subscales from the company culture questionnaire: 1) Integrity/Humanistic Culture; 2) Efficiency/Quality Oriented Culture; 3) Innovative Culture, 4) Deliberative/Traditional Culture 5) Established/Stable Culture, and 6) Urgent/Seat of the Pants Culture. These sub-scales are described in detail including the advantages as well as pitfalls of each culture in Appendix D.

This research involves two treatment groups, a control group and an intervention group. Each group was measured independently and co-dependently. Repeated measures analysis of variance was used to test the effect due to time (pre versus post intervention), treatment group (control versus intervention), and the interaction between time and treatment group. Of primary interest is knowing if the change from pre to post is different for the two treatment groups as well as the interaction effect.

No preliminary data exist to suggest what the average baseline value will be for any of the scales, therefore the sample size justification is based upon effect size. Effect size is a measure of how big a difference in response there is between the two treatment groups. Effect size as defined by the Institute of Educational Sciences, refers to the standardized magnitude of the effect or the departure from the null hypothesis. The effect size is calculated as a difference between two population means divided by the appropriate standard deviations

(Institute of Educational Sciences U.S. Department of Education, n.d.) as follow: 1) the standard deviation of the treatment group means for the main effect due to treatment; 2) the standard deviation of the interaction effect group means for the interaction effect; and 3) the standard deviation of the time means for the time effect.

It was anticipated that 60 subjects could be recruited for this study. Thus, it was anticipated that approximately 30 subjects would be in the control group and approximately 30 subjects would be in the intervention group. Each subject was measured twice as represented in a pre and post survey. Assuming no change in the company culture score from pre to post intervention in the control group and a 70% increase which is based upon the result of the sample size of 30 in the intervention group, the between-subject standard deviation is 0.71 calculated as the standard deviation of the treatment group means and the within-subject standard deviation is 1.00. This design achieves 94% power when an F test is used to test the groups (control and intervention) factor at a 5% significance level and the actual standard deviation among the appropriate means is 0.33 – this is the standard deviation of the two group means when averaged over both time points separately for each group – which represents an effect size of 0.47. The design achieves 95% power when an F test is used to test the times (pre and post) factor at a 5% significance level and the actual standard deviation among the appropriate means is 0.33 and represents an effect size of 0.33. The design achieves 81% power when an F test is used to test the group by time interaction at a 5% significance level and the actual

standard deviation among the appropriate means is 0.26 and represents an effect size of 0.26. Thus, a sample size of 60 is justifiable for this study.

4.6 Statistical Methods

All statistical analyses will be performed using SPSS for Windows (SPSS 12.0, SPSS Inc., Chicago, IL). The study sample will be described using measures of central tendency (mean and median) and dispersion (standard deviation and range) for continuous/ordinal scaled variables and frequency and percent for categorical scaled variables. All of the analyses was two-sided with a 5% alpha level unless specified otherwise.

For the primary aim of the study, hypothesis 1, the intervention will improve the company culture scores, repeated measures analysis of variance will be used to test the effect on the company culture scales due to the interaction between time and treatment group. The total variability in the response variable may be attributable to subjects, time, treatment group and interaction between treatment group and time. The repeated measures analysis of variance allows testing of whether time, group, and interaction between time and group are statistically significant factors in explaining the total variation in the dependent variable. For the secondary aim of the primary outcome measures, repeated measures analysis of variance was used to test the effect on the company culture scales due to the main effects of time and treatment group.

For hypothesis 2, adverse company culture scores (i.e. low scores) are associated with a low number of reported errors, scatter plots and Pearson correlation coefficients are used to measure the linear association between each

of the baseline company culture scales and the number of errors reported at baseline.

For hypothesis 3, individuals with greater fear of reporting errors are expected to have more adverse (i.e. lower) company culture scores on average than individuals with less fear, one-way analysis of variance is used to compare the distribution of baseline company culture scales between the various categories of Question 1 of the questionnaire, which is a surrogate measure of the subject's level of fear toward reporting errors. If the analysis of variance is found to be statistically significant, post-hoc Bonferroni adjusted two-sample t-tests can be used to determine which groups are different from which.

For exploratory purposes scatterplots and Pearson correlation statistics are used to evaluate the associations among all six company culture scores. Where necessary, either non-parametric techniques or transformation of variables was implemented in order to achieve normal distributions.

4.7 Procedure

Taking a blind stab at a random number table designated the starting point for stacking the surveys. The random number table was read from top to bottom. The odd numbers represented a control group survey and the even numbers represented an intervention group survey. The intervention group survey had literature attached to the end of the survey. The literature was a non-punitive information sheet (Appendix F) and a National Practitioner Data Bank information sheet (Appendix G). Making a guest appearance at a weekly pharmacy meeting, a brief introduction to the survey was given. The surveys were stacked

according to a random number table to allow randomization in the study. The potential subjects were asked to take a survey if they wish to participate in the study and to return it to the slot in the locked box located inside the pharmacy. The data was retrieved on a weekly basis over a two week period. Three months later, the subjects were re-surveyed in an identical format as the initial survey.

4.8 Survey Distribution and Collection

Eighty-five pharmacists at an undisclosed location in Florida were surveyed as part of this research. Fifty-two pharmacists completed and returned the survey resulting in a response rate of 61 percent. Of those fifty-two responses, 11 were deemed to be unusable because they had not completed either the initial or the follow-up survey. Therefore, a total of 48 percent of the target population were included in the analysis. Due to the sensitivity of this research in respect to the potential for retaliation for admitting to a medication error, the informed consent was waived. The low response rate could possibly be contributed to the sampling procedure or fear of reprisal or the lack of time available for an already overworked pharmacist to complete.

4.9 Method Summary

Of the six organizational cultures discussed above, it was determined that the culture representative of the organization studied in this research had an integrity/humanistic workplace culture. This is discussed in greater detail in Chapter 6. Although it was anticipated that sixty pharmacists would participate in this study, only forty-one were recruited. However, the statistical measures remained the same but, the effect size had to be recalculated based upon the

group (control and intervention) distribution. Chapter 5 explains in detail the changes in the effect size to account for a lower number of participants.

Chapter 5

Data Analysis

5.1 Introduction

The data was collected on a weekly basis during the pre and post timeframe, sorted according to group (control or intervention), and coded (a false response represented a value of 0 and a true response represented a value of 1). The coded data was put into an Excel spreadsheet and then analyzed using SPSS for Windows. While some surveys were missing data, the researcher chose to replace the missing values with the average for all non-missing questions within a given scale, by a study participant. SPSS supports the replacement of missing values with the series mean (SPSS, 1997). None of the surveys required more than 3 missing values to be replaced. Both descriptive and inferential statistical methods were employed. All testing was based on determining statistical significance at a two-sided alpha level of 0.05. As stated in Chapter 4, the study sample was described using measures of central tendency (mean and median) and dispersion (standard deviation and range) for continuous variables and frequency and percentage for categorical variables. Repeated measures analysis of variance was used to test the effect due to time (pre versus post intervention), treatment group (control versus intervention), and the interaction between time and treatment group.

5.1.1 Variations to Statistical Methods

Although an attempt was made to recruit 60 possible participants, only 52 responded, 41 of which had usable data. There were a total of 41 valid surveys which corresponded to the N-value used for statistical analyses of the data. The group distribution (control and experimental) for the 41 participants is located in Table 5.1. The control group had a total of 16 participants and the intervention group had a total of 25 participants. To accommodate the lower number of participants than expected and to validate the data, a repeated measures design with one between factor, treatment group (Control versus Intervention), and one within factor, time (Pre versus Post) was used to analyze the data. This design uses the Geisser-Greenhouse correction as referred to in SPSS. It is a correction factor that is computed which corrects the degrees of freedom more than other F-tests (Keppel, n.d.). This design achieves 44% power to test the treatment factor using a Geisser-Greenhouse Corrected F Test with a 5% significance level when the actual standard deviation is 0.04 which represents an effect size of 0.29. It achieves 88% power to test the time factor using a Geisser-Greenhouse Corrected F Test with a 5% significance level when the actual standard deviation is 0.04 which represents an effect size of 0.50. The design achieves 88% power to test the interaction between treatment and time using a Geisser-Greenhouse Corrected F Test with a 5% significance level when the actual standard deviation is 0.04 and represents an effect size of 0.50.

Table 5.1 Group Distribution

	Group	Frequency	Percent
Valid	Control	16	39
	Intervention	25	61
	Total	41	100

It was stated in Chapter 4 that Hypothesis 2, adverse company culture scores (i.e.low scores) will be associated with a low number of reported errors, would be analyzed using scatter plots and Pearson correlation coefficients in order to measure the linear association between each of the baseline company culture scales and the number of errors reported at baseline. The Pearson correlation coefficient measures the strength and direction of a linear relationship between the X and Y variables (Lethen, 1996). The data collected for Hypothesis 2 was comprehensive of the entire pharmacy instead of on an individual basis. Therefore, a quantitative and qualitative approach was taken to answer Hypothesis 2.

Although in Chapter 4, it was stated that for Hypothesis 3, individuals with greater fear of reporting errors will have more adverse (i.e. lower) company culture scores on average than individuals with less fear, a one-way analysis of variance will be used. The one-way analysis of variance was to compare the distribution of baseline company culture scales between the various categories of Question 1 of the survey. The various scales represented a surrogate measure of the subject's level of fear toward reporting errors. Because of the responses received for Question 1, a different test statistic was employed. Two-sample t-

tests were used to compare the average company culture scores for Question 1 of the survey, between those who said they would report errors “immediately” versus those who did not say they would report the error immediately. Pearson’s correlation coefficient was used to measure the linear association between the company culture scores.

5.1.2 Derivation of Scale Scores

Scale scores were derived according to the instructions provided by Connect Two. The number of true responses were counted and the subscale which had the most true responses, percentage wise, was indicative of that type of culture in the organization studied. If there were the same number of true responses in more than one section, the culture match is assigned to this combination of types (www.ConnectTwo.com). Table 5.2 summarizes the data for pre and post survey for each scale. Minimum refers to the lowest scale score that was marked by at least one participant for one of the scale categories. Pre_Scale 6 as well as Post_Scale 6 had the lowest minimum percentage of 0.13 which indicates that the culture present was less likely to be that of urgent/seat of the pants type of culture. Maximum refers to the highest scale score that was marked by a participant for one of the scale categories in which a score of 1 indicated that at least one participant marked each item as true in a particular category. Pre_Scales 1, 3, 4, and 5 as well as Post_Scales 1, 3, 4, and 5 all had a maximum score of 1. Not one participant agreed with all the attributes of Pre_Scales 2 and 6 as well as Post_Scales 2 and 6. Figures 5.1, 5.2, 5.3, and 5.4 depict this graphically in a frequency histogram. Scale 2 refers to an

efficiency/quality oriented culture while Scale 6 refers to an urgent/seat of the pants culture. Figure 5.2 represents Pre-Scale 6 data and Figure 5.4 represents the Post Scale 6 data. Both figures seem to be of a bi-modal nature. Individually, the histograms seem to illustrate two values or data ranges that appear most often. This could reflect the presence of two different processes being mixed. For instance, this could be a result of pharmacists operating on two different shifts. Overall, what Figures 5.1, 5.2, 5.3, and 5.4 illustrate is that there was not at least one pharmacist in the pre and post survey that agreed (true response) to all questions relative to the efficiency/quality oriented culture (Questions 14-19) nor the urgent/seat of the pants culture (Questions 36-43).

Table 5.2 Pre and Post Survey Data for Scales

Statistics						
Scale	N Valid	Mean	Median	Standard Deviation	Minimum	Maximum
Pre_Scale1	41	0.77	0.80	0.13	0.44	1
Pre_Scale2	41	0.51	0.50	0.17	0.17	0.83
Pre_Scale3	41	0.63	0.67	0.17	0.33	1
Pre_Scale4	41	0.74	0.80	0.23	0.25	1
Pre_Scale5	41	0.74	0.80	0.21	0.40	1
Pre_Scale6	41	0.50	0.50	0.17	0.13	0.75
Post_Scale1	41	0.78	0.80	0.12	0.50	1
Post_Scale2	41	0.53	0.50	0.14	0.17	0.83
Post_Scale3	41	0.67	0.67	0.18	0.17	1
Post_Scale4	41	0.74	0.80	0.21	0.20	1
Post_Scale5	41	0.76	0.80	0.19	0.40	1
Post_Scale6	41	0.53	0.63	0.17	0.13	0.75

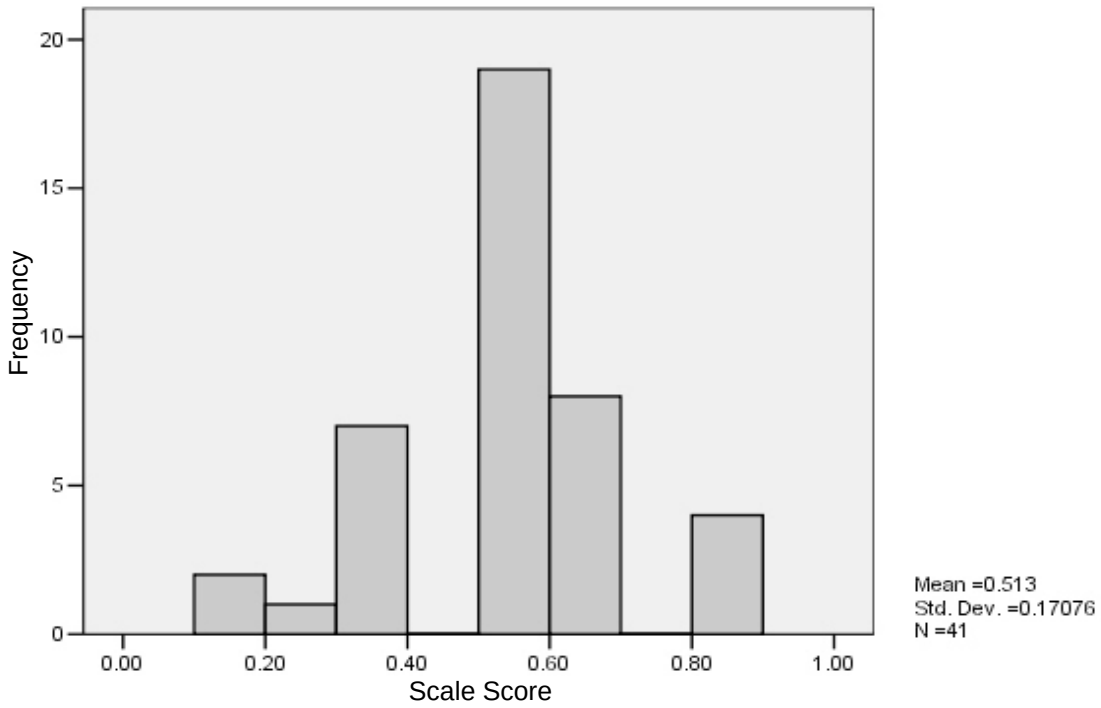

Figure 5.1 Pre_Scale 2 Frequency Histogram
Note: All values are in generic units

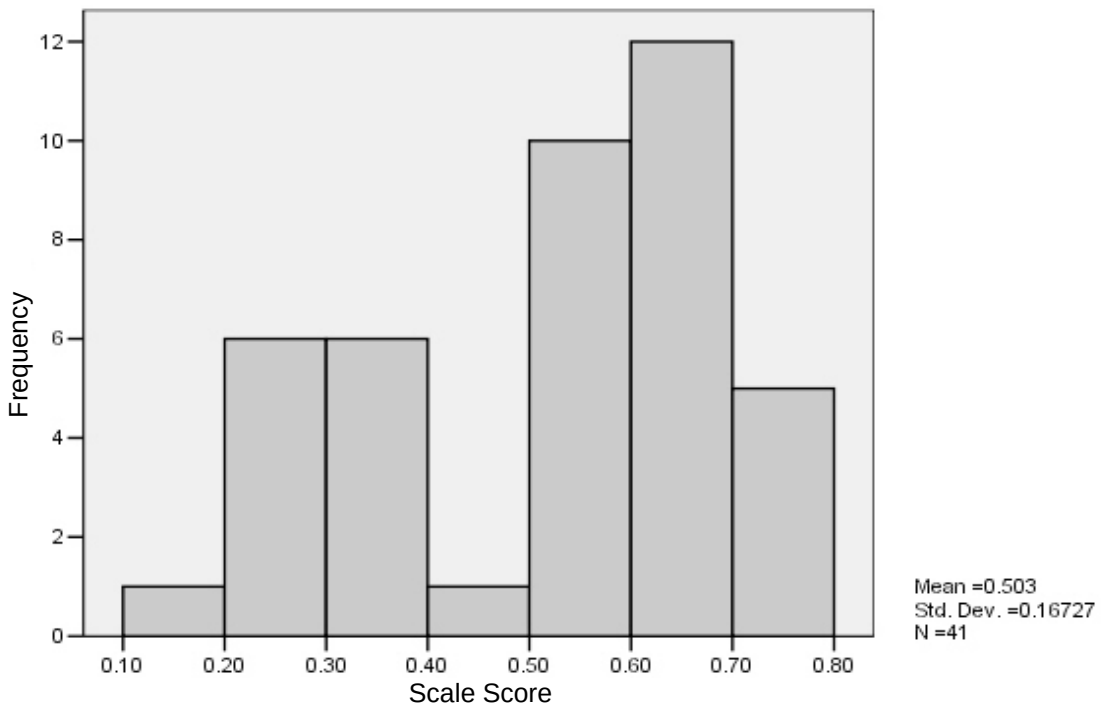

Figure 5.2 Pre_Scale 6 Frequency Histogram
Note: All values are in generic units

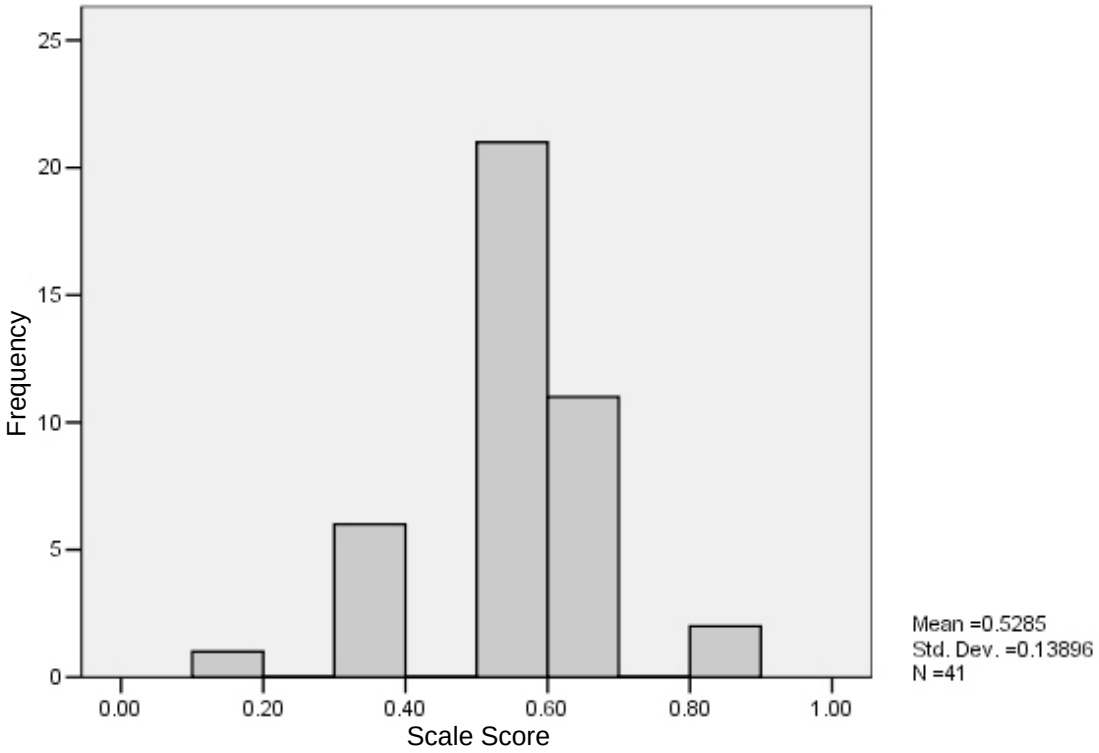

Figure 5.3 Post_Scale 2 Frequency Histogram
Note: All Values are in generic units

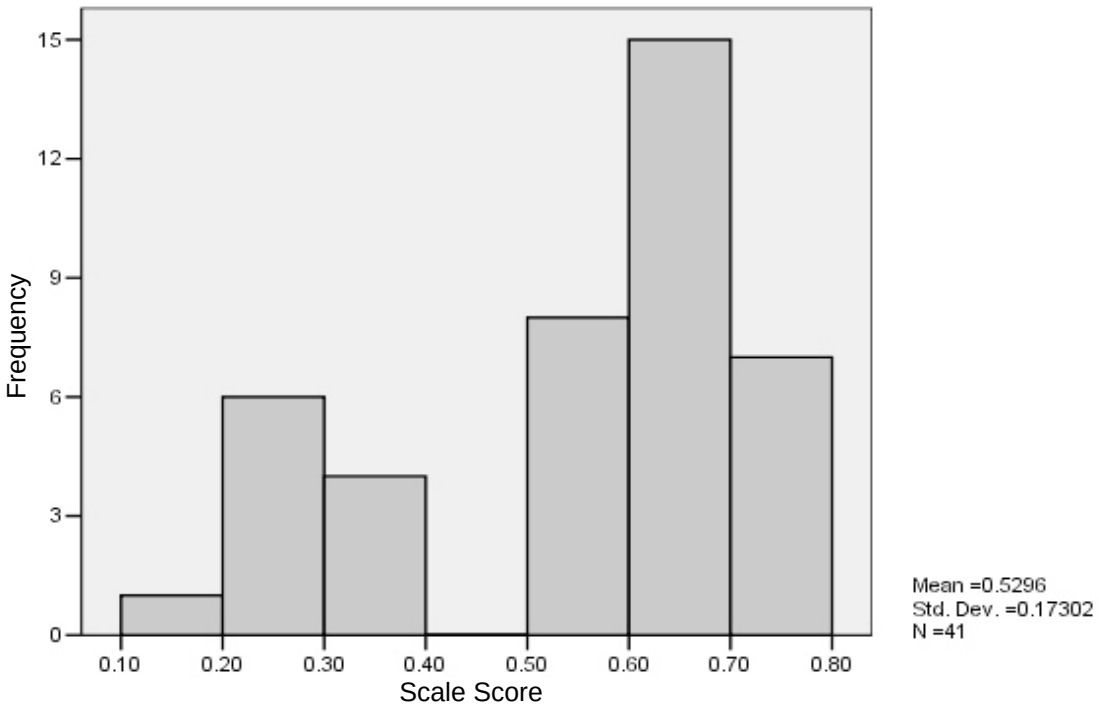

Figure 5.4 Post_Scale 6 Frequency Histogram
Note: All Values are in generic units

5.2 Hypothesis 1 Data Analysis

For Hypothesis 1, intervention will improve the company culture scores, repeated measures analysis of variance was used to test the effect on the company culture scales due to the interaction between time and treatment group. Table 5.3 shows that the main effect for time was not statistically significant (P=0.827). Additionally, Table 5.3 shows that the interaction effect between time and treatment group was not statistically significant (P=0.084). In other words, the National Practitioner Data Bank information and the Non-Punitive Culture information sheet had no significant effect from pre to post survey on the improvement of company culture scores.

Table 5.3 Tests of Within-Subjects Effect Scale 1

Source		Type III Sum of Squares	df	Mean Square	F	P
Time	Sphericity Assumed	0	1	0	0.049	0.827
	Greenhouse-Geisser	0	1	0	0.049	0.827
	Huynh-Feldt	0	1	0	0.049	0.827
	Lower-bound	0	1	0	0.049	0.827
time * group	Sphericity Assumed	0.016	1	0.016	3.155	0.084
	Greenhouse-Geisser	0.016	1	0.016	3.155	0.084
	Huynh-Feldt	0.016	1	0.016	3.155	0.084
	Lower-bound	0.016	1	0.016	3.155	0.084

Table 5.4 shows that the main effect of treatment group was not statistically significant (P=0.099). Table 5.5 and Figure 5.5 show how the average score differed between the control and intervention groups. The control

group had an average Scale 1 score of 0.803 while the intervention group's average Scale 1 score was 0.743. The average scale score shows how likely the group studied is of that particular culture. It is expected that the pre and post scale scores would be minimally different. Table 5.6 and Figure 5.6 show the pattern of variation in the average Scale 1 over time. The average Scale 1 score was 0.78 versus 0.77 for pre and post, respectively. This implies that when the pharmacists were asked questions relative to an integrity type culture (Questions 2-13), the pharmacists were quite consistent in the survey responses from pre to post.

Table 5.4 Test of Between-Subject Effect Scale 1

Source	Type III Sum of Squares	df	Mean Square	F	P(2-tailed)
Group	0.069	1	0.069	2.849	0.099

Table 5.5 Average Scale 1 Score for Treatment Groups

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Control	0.803	0.027	0.747	0.858
Intervention	0.743	0.022	0.699	0.788

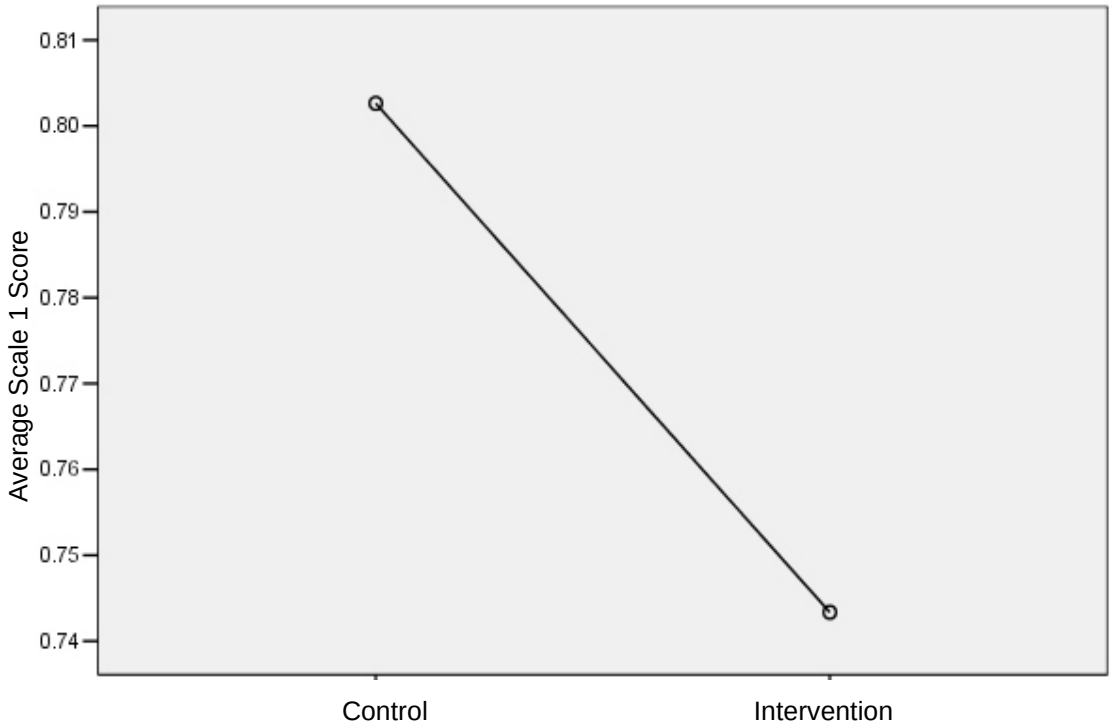

Figure 5.5 Group Variation Average Scale 1 Score
Note: All Values are in generic units

Table 5.7 and Figure 5.7 show how the pattern of variation in the average score over time differed for the control and intervention groups. The average Scale 1 score decreased for the control group from pre (0.819) to post (0.786) while the intervention group increased from pre (0.731) to post (0.756).

Table 5.6 Variation in Average Scale 1 Score Over Time

Time	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Pre	0.775	0.02	0.734	0.815
Post	0.771	0.019	0.733	0.809

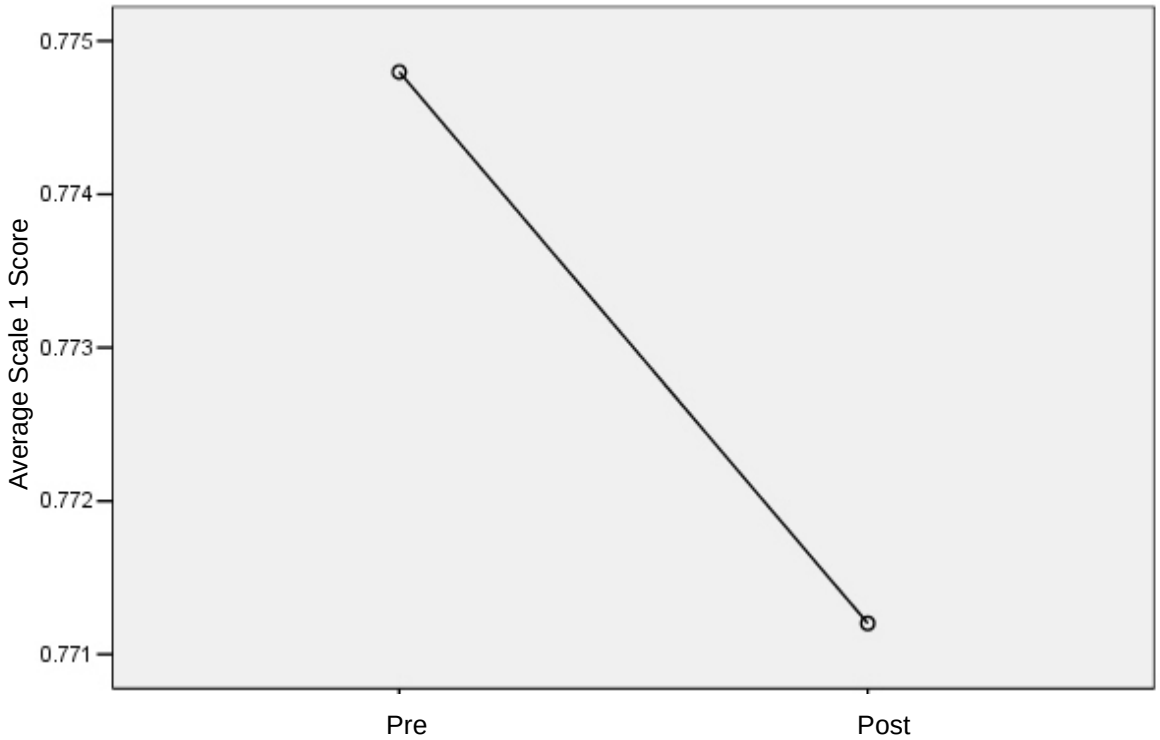

Figure 5.6 Variation Average Scale 1 Score Over Time
Note: All Values are in generic units

Table 5.7 Group Variation in Average Scale 1 Score Over Time

Group	time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Control	Pre	0.819	0.031	0.756	0.882
	Post	0.786	0.029	0.727	0.846
Intervention	Pre	0.731	0.025	0.68	0.781
	Post	0.756	0.023	0.709	0.803

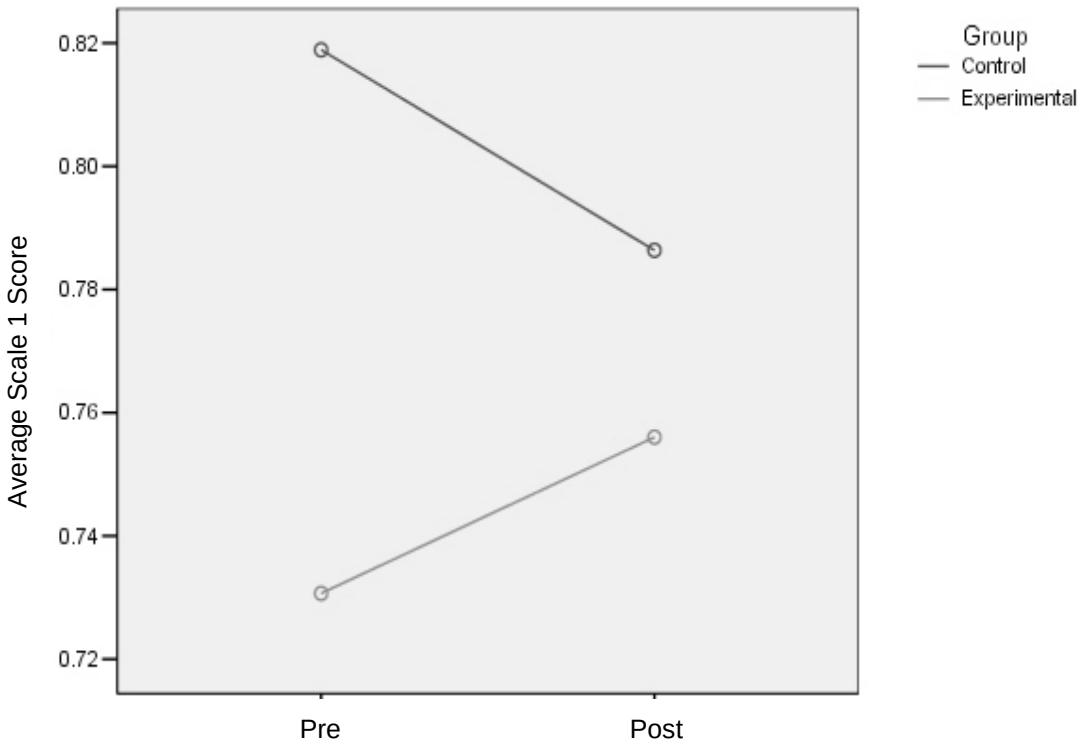

Figure 5.7 Group Variation Average Scale 1 Score Over Time

Note: All Values are in generic units

Repeated measures of analysis of variance was used to test the main effects and the interaction effect for each of the six scales. The data for Scale 1 was presented above. After analyzing the data for Scales 2 through Scale 6 it was found that the main effect for time, the interaction effect between time and treatment group, as well as the main effect of treatment group were not statistically significant. In other words, pre to post had no bearing on the Scale 2 through Scale 6 nor did the interaction of pre and post in relation to the control group and the intervention group. Further, the control group and the intervention group had no effect on the cultures studied from Scale 2 through Scale 6.

A comprehensive table for tests of within-subjects effects for all six scales was produced and included in Appendix H. The p-value for all within-subjects

effect was greater than 0.05. This implies that the within-subjects, pre versus post, had no bearing on this study. The data for Scale 1 through Scale 6 is summarized in Tables 5.8 through 5.11. The range of P-values in Table 5.8 goes from 0.099 (Scale 1) to 0.831 (Scale 5). Note that all P-values are greater than 0.05 which indicates that the between-subjects effect is not significant. Table 5.9 shows that the control group's Scale 1 score had the greatest mean of 0.803 and the intervention group's Scale 6 score had the lowest mean of 0.493. This implies that the culture studied is more like Scale 1 (Integrity) for the control group and less like Scale 6 (Urgency) for the intervention group. In Table 5.10, Scale 1 pre-survey had the greatest mean score of 0.775 and standard error of 0.02 while Scale 6 pre-survey had the lowest mean score of 0.507 and a standard error of 0.027. Again, this implies that the pre-survey culture was more like Scale 1 (Integrity) and less like Scale 6 (Urgency). In fact, the organization studied had relatively similar scores for Scale 1 (Integrity = 0.775), Scale 3 (0.634), Scale 4 (0.743) and Scale 5 (0.742). Since Scale 1 (Integrity) was the highest the evaluations of the study is based on that scale. Table 5.11 summarizes the average scale score from the treatment groups over time (pre and post).

Although the tables and graphs provide useful information, none of the results validated Hypothesis 1. Therefore, it is concluded that intervention in the forms presented in this research -survey development and informational sheets- will not improve company culture scores. On another note, had the research been setup with a P-value less than 0.1 as significant, the between-subject effect

would have been marginally significant for Scale 1 (P=.099). This would have indicated that the observed difference is too large to be explained by chance alone. In other words, we would have failed to reject the hypothesis that intervention will improve the company culture scores.

Table 5.8 Tests of Between-Subjects Effects

Scale	Source	Type III Sum of Squares	df	Mean Square	F	P
Scale 1	Group	0.069	1	0.069	2.849	0.099
Scale 2	Group	0.011	1	0.011	0.309	0.581
Scale 3	Group	0.064	1	0.064	1.473	0.232
Scale 4	Group	0.015	1	0.015	0.201	0.656
Scale 5	Group	0.003	1	0.003	0.046	0.831
Scale 6	Group	0.068	1	0.068	1.661	0.205

Table 5.9 Average Score for Treatment Groups

Scale	Group	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Scale 1	Control	0.803	0.027	0.747	0.858
	Intervention	0.743	0.022	0.699	0.788
Scale 2	Control	0.506	0.033	0.439	0.574
	Intervention	0.53	0.027	0.476	0.584
Scale 3	Control	0.689	0.037	0.614	0.764
	Intervention	0.632	0.03	0.572	0.691
Scale 4	Control	0.755	0.048	0.657	0.852
	Intervention	0.727	0.039	0.649	0.805
Scale 5	Control	0.747	0.044	0.658	0.836
	Intervention	0.759	0.035	0.688	0.83
Scale 6	Control	0.552	0.036	0.48	0.625
	Intervention	0.493	0.029	0.435	0.551

Table 5.10 Average Scale Score Over Time

Scale	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Scale 1	Pre	0.775	0.02	0.734	0.815
	Post	0.771	0.019	0.733	0.809
Scale 2	Pre	0.511	0.028	0.455	0.567
	Post	0.525	0.022	0.48	0.571
Scale 3	Pre	0.634	0.028	0.579	0.69
	Post	0.686	0.028	0.629	0.744
Scale 4	Pre	0.743	0.037	0.668	0.818
	Post	0.739	0.035	0.669	0.809
Scale 5	Pre	0.742	0.035	0.671	0.812
	Post	0.764	0.031	0.702	0.826
Scale 6	Pre	0.507	0.027	0.453	0.562
	Post	0.538	0.027	0.483	0.594

Table 5.11 Group Variation in Average Scale Score Over Time

Scale	Group	Time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Scale 1	Control	Pre	0.819	0.031	0.756	0.882
		Post	0.786	0.029	0.727	0.846
	Intervention	Pre	0.731	0.025	0.68	0.781
		Post	0.756	0.023	0.709	0.803
Scale 2	Control	Pre	0.502	0.043	0.415	0.589
		Post	0.51	0.035	0.44	0.581
	Intervention	Pre	0.52	0.035	0.45	0.59
		Post	0.54	0.028	0.483	0.597
Scale 3	Control	Pre	0.639	0.043	0.552	0.725
		Post	0.74	0.044	0.65	0.829
	Intervention	Pre	0.63	0.034	0.56	0.7
		Post	0.633	0.035	0.562	0.705
Scale 4	Control	Pre	0.772	0.058	0.654	0.889
		Post	0.738	0.054	0.628	0.847
	Intervention	Pre	0.714	0.046	0.62	0.808
		Post	0.74	0.043	0.653	0.827
Scale 5	Control	Pre	0.731	0.054	0.622	0.841
		Post	0.763	0.048	0.666	0.859
	Intervention	Pre	0.752	0.043	0.664	0.84
		Post	0.766	0.038	0.689	0.843
Scale 6	Control	Pre	0.527	0.042	0.442	0.612
		Post	0.578	0.043	0.492	0.664
	Intervention	Pre	0.488	0.034	0.42	0.556
		Post	0.499	0.034	0.43	0.568

5.3 Hypothesis 2 Data Analysis

The number of reported medication errors that occurred in pharmacy during the pre and post survey as well as the prior year pre and post survey timeframe are included in Table 5.12. Although there is a difference (100% increase) from pre (3 medication errors) to post (6 medication errors), this can lead one to believe the lowest company culture score was during the pre-survey and the highest company culture score was during the post survey. Looking at Table 5.10 located in Section 5.2, the lowest average mean score in relation to time for the pre-survey was Scale 6 (Urgency) and the highest post survey scale score was Scale 1 (Integrity).

It was important to obtain the number of reported medication errors during the prior year timeframe for both pre and post survey in order to determine if there was pattern. The idea was to get a snapshot of the past reporting history and compare it to the recently reported medication errors to determine if there was increased reporting. Taking it a step further, the researcher decided to determine if there would be a continued effort to report medication errors once the post survey was completed. So, the researcher decided to track the number of reported medication errors for an additional three months after the post survey. In order to determine if there were any changes, the researcher decided that the prior year data for the additional three months tested was just as important. The researcher thought that after partaking in the survey, pharmacists would be prone to report medication errors immediately. Hence, it was anticipated that there would be an increase in the number of reported medication errors after the

post survey. The data is presented in Table 5.13. Figure 5.8 represents the data graphically. Table 5.13 and Figure 5.8, show that over a 3-month post survey period, 30 medication errors were reported as compared to 22 medication errors reported during the same timeframe in the prior year. That equates to a 26.7% increase in the number of medication errors reported. Thus, Hypothesis 2, low company culture scores are associated with a low number of reported errors, was not rejected.

Table 5.12 Reported Medication Errors

Timeframe	Number of Reported Medication Errors
Pre-Survey	3
Post Survey	6
Prior Year Pre-Survey	0
Prior Year Post Survey	0

Table 5.13 Post Survey Reported Medication Errors

Timeframe	April	May	June
2005	10	8	12
2004	6	10	6

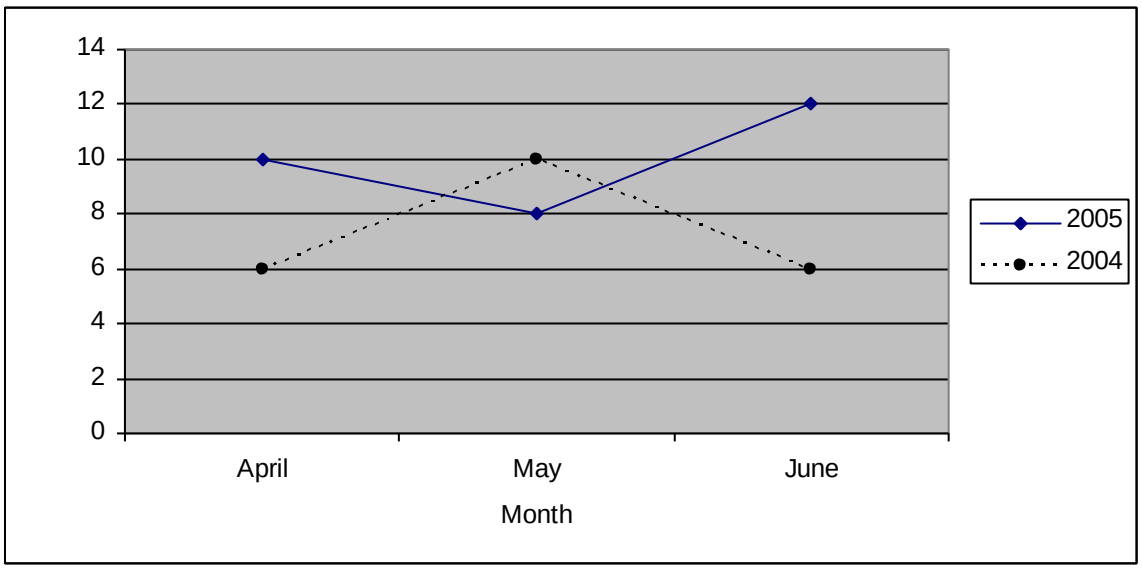

Figure 5.8 Post Survey Reported Medication Errors

Note: All Values are in generic units

5.4 Hypothesis 3 Data Analysis

Question 1 of the survey was independently analyzed to address Hypothesis 3 that individuals with greater fear of reporting errors will have more adverse (i.e. lower) company culture scores on average than individuals with less fear. Three subjects were missing data for Question 1. Of the remaining 38 subjects, 31 (82%) said that they would report an error immediately. One (3%) subject said that he or she would report the error only if someone saw them or knew that it could have only been them. One (3%) said that he or she would report the error if it were a minor error (no patient harm). Five (13%) said they would report the error if it were a major error (serious patient harm). The last three groups were too small to analyze statistically so they were combined into one group and labeled, “not immediately”.

Now, the analysis compared two groups, those who said, “immediately” (n=31) versus those who did not say, “immediately” (n=7). Since there were only two groups to be compared, the two-sample t-test was used instead of analysis of variance. Table 5.14 presents scale data for all six scales for Question 1. Table 5.14 shows that those who said, “immediately” had the highest mean scale score (0.78) for Scale 1 (Integrity) and the lowest mean scale score (0.51) for Scale 6 (Urgency). For those who said, “not immediately”, the highest mean scale score (0.66) for Scale 1 and the lowest mean scale score (0.45) for Scale 2 (Efficiency). This implies that those who said, “immediately”, as well as “not immediately” both align with Scale 1 (Integrity). Those that said “immediately” would less likely align with Scale 6 (Urgency) and those that said “not immediately” would less likely align with Scale 2 (Efficiency). Table 5.15 presents the equality of means for all six scales in relation to Question 1. After studying Table 5.15 and analyzing Figure 5.9, it was found that there is some evidence to suggest that those who would not report errors “immediately” tend to have a lower Scale 1 score than those who did say “immediately.” Table 5.14 and 5.15 show that the group that did not say “immediately” had a statistically significantly smaller average Scale 1 score than the group that did say “immediately.” The average standard deviation for Scale 1 score for the group that did say “immediately” was 0.78 versus 0.66 for the group that did and did not say “immediately.” The P-value for the equality of means of Scale 1 scores was 0.036. This suggests that we accept the hypothesis that individuals with greater fear of reporting errors will

have more adverse (i.e. lower) company culture scores on average than individuals with less fear for Scale 1 (Integrity).

Table 5.14 Question 1 Scale Data

Scale	Question1	N		Mean	Median	Std. Deviation	Minimum	Maximum
		Valid	Missing					
Scale1	Immediately	31	0	0.7801	0.8	0.1274	0.44	1
	Not Immediately	7	0	0.6646	0.7	0.12211	0.5	0.82
Scale 2	Immediately	31	0	0.5226	0.5	0.17393	0.17	0.83
	Not Immediately	7	0	0.4524	0.5	0.18545	0.17	0.67
Scale 3	Immediately	31	0	0.629	0.6667	0.1692	0.33	0.83
	Not Immediately	7	0	0.5905	0.6667	0.15482	0.33	0.8
Scale 4	Immediately	31	0	0.779	0.8	0.22127	0.4	1
	Not Immediately	7	0	0.6	0.6	0.1633	0.4	0.8
Scale 5	Immediately	31	0	0.7774	0.8	0.2089	0.4	1
	Not Immediately	7	0	0.6571	0.6	0.22254	0.4	1
Scale 6	Immediately	31	0	0.5121	0.5	0.16034	0.25	0.75
	Not Immediately	7	0	0.5	0.5	0.17678	0.25	0.75

Table 5.15 Equality of Means

Scale	t-test for Equality of Means		
	t	df	P-Value (2-tailed)
Scale1	2.182	36	0.036*
Scale 2	0.954	36	0.347
Scale 3	0.552	36	0.584
Scale 4	2.011	36	0.052
Scale 5	1.361	36	0.182
Scale 6	0.177	36	0.86

* indicates P< 0.05

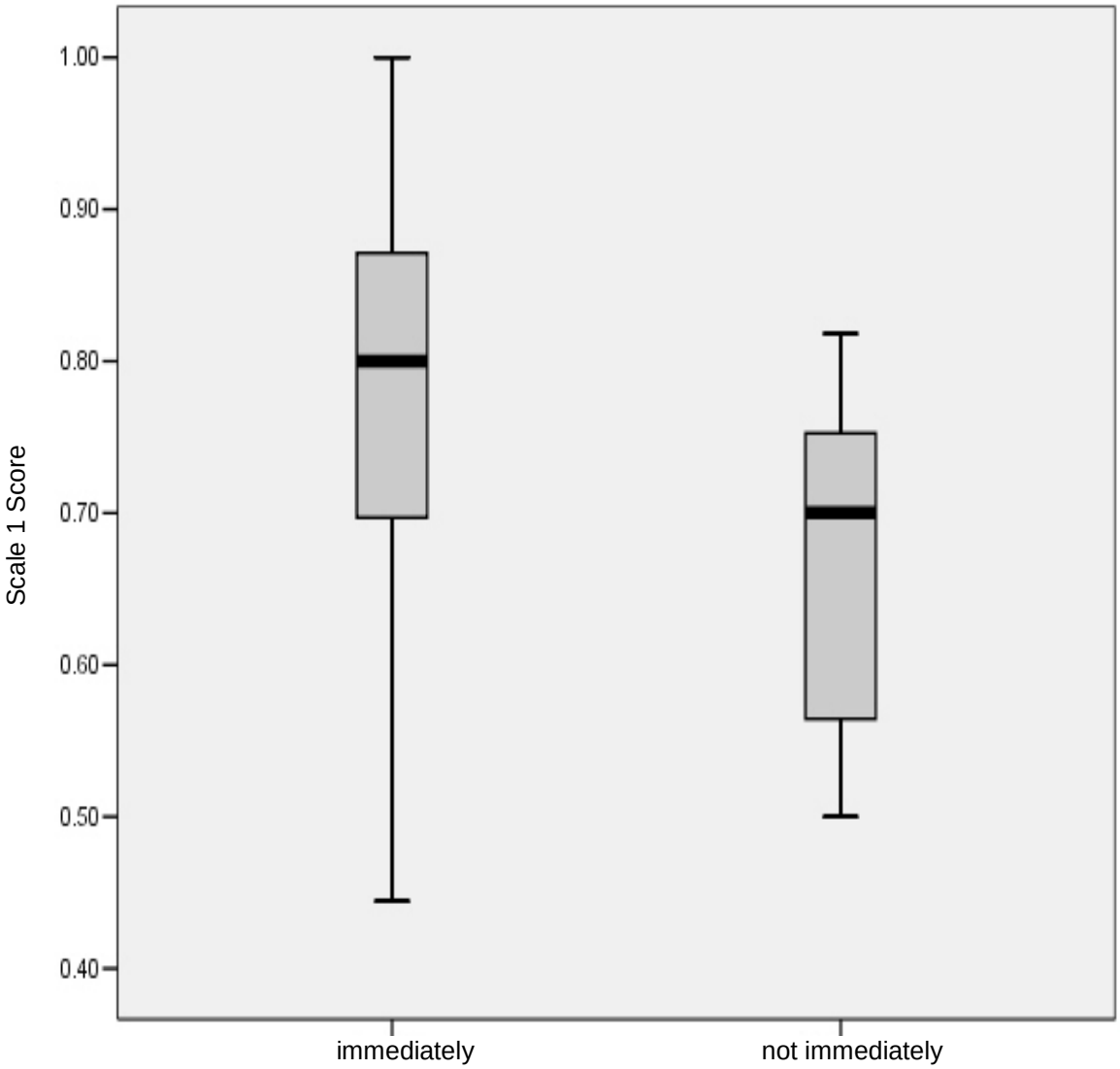

Figure 5.9 Distribution of Scale 1 Scores for Question 1
Note: All Values are in generic units

Further analysis of Tables 5.14 and 5.15 showed that there is little evidence to suggest a difference between those who said “immediately” versus those who did not say “immediately” for Scales 2, 3, 5, and 6. The P-value for those scales were all greater than 0.05. After analyzing Figure 5.10 which is

exclusively Scale 4 data, there is some evidence to suggest a difference between the two groups – “immediately” and “not immediately.” However, Tables 5.14 and 5.15 show that there was not a statistically significant difference in the average Scale 4 score between the two groups. The average standard deviation Scale 4 score was 0.78 versus 0.60 for the group that did and did not say immediately, respectively (P=0.052).

Had the P-value tested been set to less than 0.1, Tables 5.14 and 5.15 would have shown a statistically significant difference for Scale 4 (Traditional Culture) between the two groups – “immediately” and “not immediately.” This would have indicated that the observed difference is too large to be explained by chance alone. In other words, it is probably true that individuals with greater fear of reporting errors had lower company culture scores on average than individuals with less fear, for Scale 4 (Traditional).

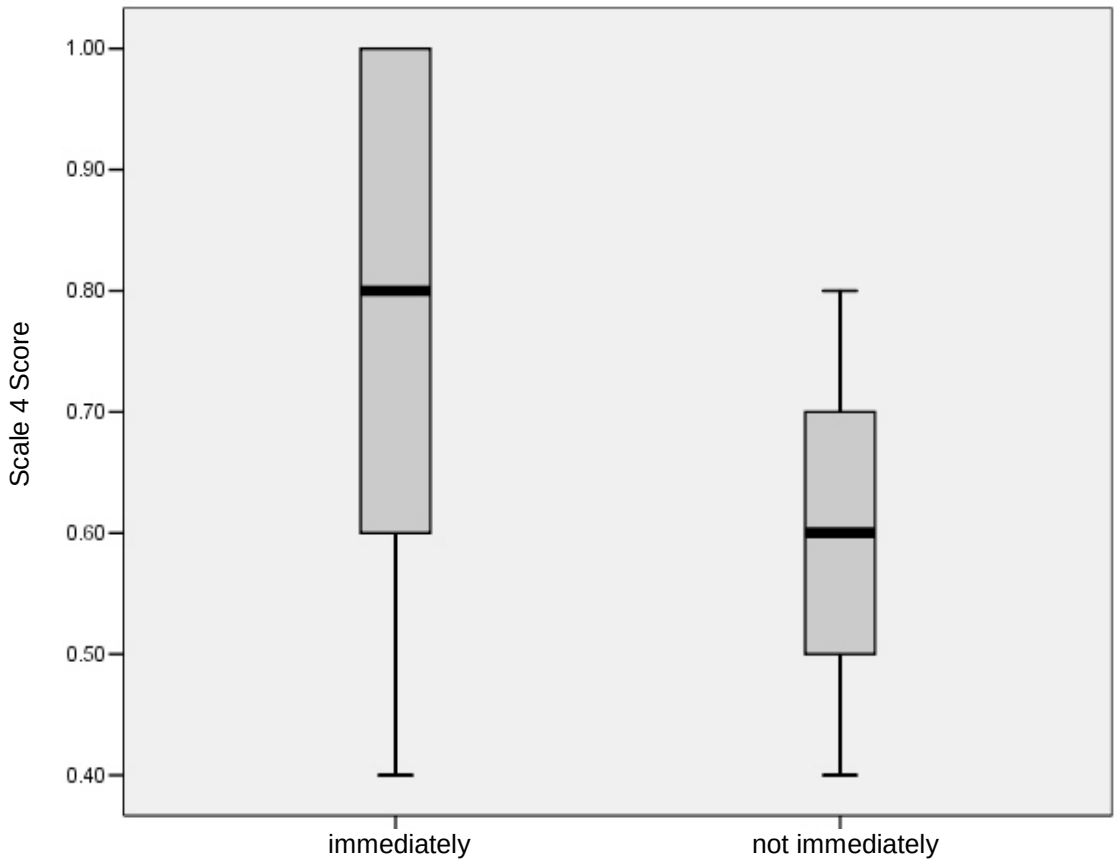

Figure 5.10 Distribution of Scale 4 Scores for Question 1
Note: All Values are in generic units

5.5 Exploratory Data Analysis

For exploratory purposes, scatter plots and Pearson's correlation statistics were used to compare each company culture score with each other. Table 5.16 summarizes the data for the Pearson's correlation statistics for each of the company culture scales. Of all the comparisons between the six company culture scales, only Scale 4 (Traditional) and Scale 5 (Stableness) were statistically significantly correlated. Although Figure 5.11 shows little evidence of a linear association, Table 5.16 shows that there was a statistically significant,

moderately strong positive association between Scale 4 and Scale 5, r=0.48 with a corresponding P-value of 0.002. This made the exploratory analysis well worth the additional investigation.

It has been shown, yet again, that if the statistically significance level had been set to a P-value less than 0.1, Scale 4 (Traditional) and Scale 2 (Efficiency) as well as Scale 5 (Stableness) and Scale 6 (Urgency)would have been statistically significantly correlated with P-values of 0.097 and 0.087, respectively.

Table 5.16 Pearson's Correlation Coefficient for all Scales

Scale		Scale1	Scale2	Scale3	Scale4	Scale5	Scale6
Scale1	Pearson Correlation	1	0.089	0.009	0.258	0.051	0.235
	P-value		0.579	0.957	0.103	0.754	0.139
	N	41	41	41	41	41	41
Scale2	Pearson Correlation	0.089	1	-0.071	0.263	0.156	0.207
	P-value	0.579		0.66	0.097	0.33	0.193
	N	41	41	41	41	41	41
Scale3	Pearson Correlation	0.009	-0.071	1	0.161	0.139	-0.101
	P-value	0.957	0.66		0.314	0.385	0.528
	N	41	41	41	41	41	41
Scale4	Pearson Correlation	0.258	0.263	0.161	1	.478(**)	0.25
	P-value	0.103	0.097	0.314		0.002	0.115
	N	41	41	41	41	41	41
Scale5	Pearson Correlation	0.051	0.156	0.139	.478(**)	1	0.27
	P-value	0.754	0.33	0.385	0.002		0.087
	N	41	41	41	41	41	41
Scale6	Pearson Correlation	0.235	0.207	-0.101	0.25	0.27	1
	P-value	0.139	0.193	0.528	0.115	0.087	
	N	41	41	41	41	41	41

** Correlation is significant at the 0.01 level (2-tailed).

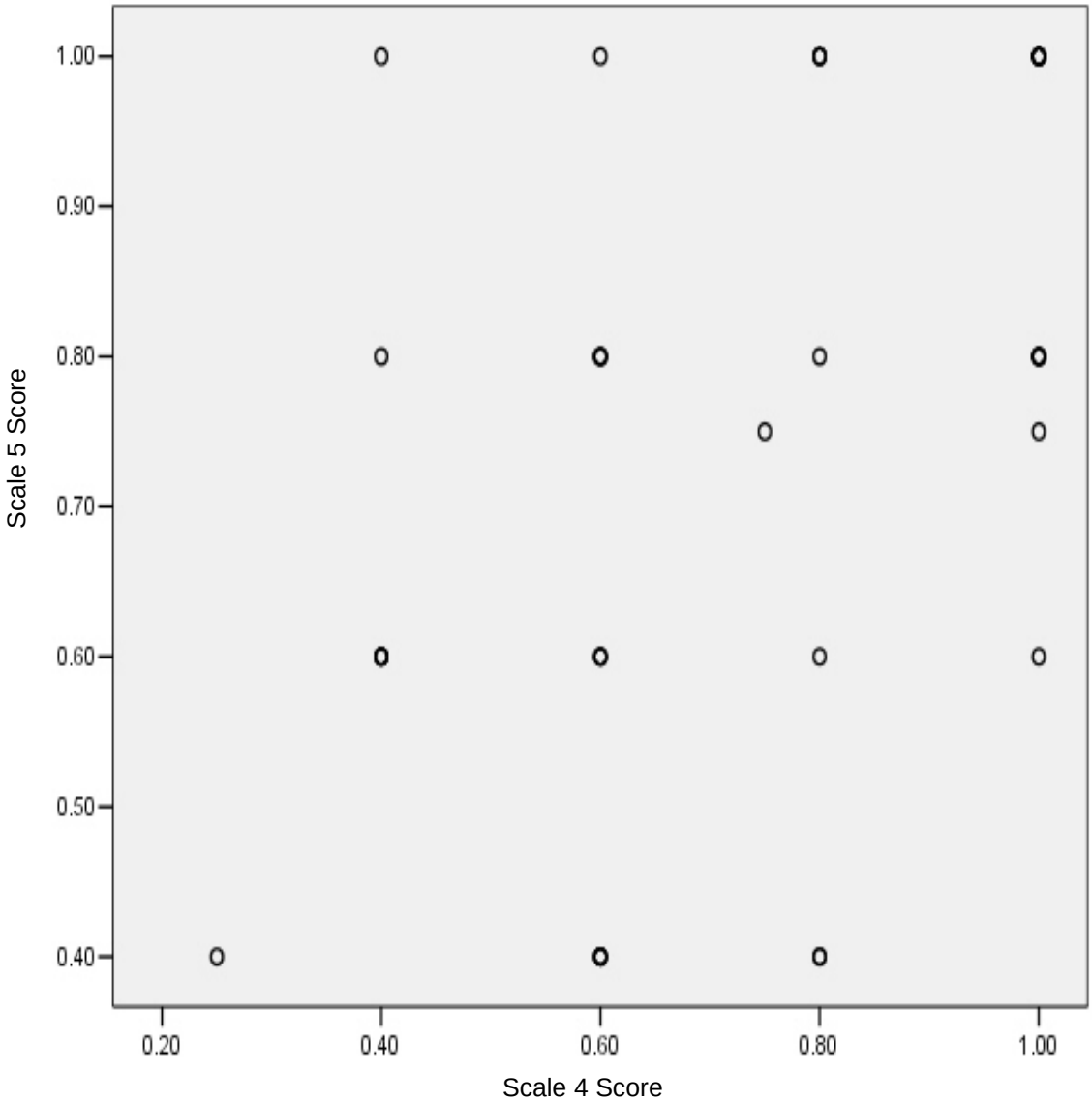

Figure 5.11 Scatter Plot of Scale 4 versus Scale 5
Note: All Values are in generic units

5.6 Data Summary

It was quite interesting to see the data bring true meaning to this dissertation. Although Hypothesis 1 was rejected and variations had to be made for the analysis of Hypothesis 2 and Hypothesis 3, the tables and graphs revealed a clear picture of what the data meant. It was determined for Scale 1

(Integrity) that Hypothesis 3, individuals with greater fear of reporting errors will have more adverse (i.e. lower) company culture scores on average than individuals with less fear, was not rejected. It was determined that the group that would not report errors “immediately” had a statistically significantly smaller average Scale 1 (Integrity) score than those who said they would report errors “immediately.” In the exploratory section of this dissertation, Section 5.5, it was discovered that Scale 4 and Scale 5 were statistically significantly correlated.

In summary, Hypothesis 1, Intervention will improve company culture, was rejected. Hypothesis 2, Low company culture scores are associated with a low number of reported errors, was not rejected. Hypothesis 3, Individuals with a greater fear of reporting errors versus the average score will have lower company culture scores on average than individuals with less fear, was not rejected. Further detail is provided in Chapter 6.

Chapter 6

Discussion of Results, Conclusions, and Recommendations

6.1 Discussion of Work

The 1999 Institute of Medicine report, *To Err Is Human*, sparked a worldwide debate over medical errors. It shed light on the exacerbated problem of medical errors that aggregately went unnoticed and undetected for many years. The report however, united organizations to form commitments to better understand how to deliver high quality care. Many organizations formed partnerships and began the development of workshops geared towards the sharing of information on medical errors. The "person's approach" was and still is dominant in the healthcare industry. The view shared by those that utilize the person's approach is that someone caused the medical error. The systemic way of analyzing a medical error plays no role in the person's approach. It was not until recently that the medical industry realized the role that the system played in medical errors. Yet, some prefer the person's approach to error while others, in growing numbers, choose a system's approach.

Three hypotheses were developed and tested in this dissertation. It was hypothesized that 1) intervention would improve company culture; 2) low company culture scores would be associated with a low number of reported errors; and 3) individuals with a greater fear of reporting errors will have lower

company culture scores on average than individuals with less fear. These hypotheses were tested on pharmacists at an undisclosed facility in Florida.

6.2 Conclusions

Intervention was expected to improve company culture scores. The intervention was in the form of information – National Practitioner Data Bank information sheet and Non-Punitive Culture information sheet. The reason behind the use of the National Practitioner Data Bank information sheet as part of the intervention tool was that an anonymous source said, “Why would I report a medication error or encourage others to do so, when the National Practitioner Data Bank serves as a lynching mob for those who make errors?” The researcher believed that if one pharmacist felt this way, there were many others that shared this identical thought of the National Practitioner Data Bank. Another comment made by a pharmacist regarding the National Practitioner Data Bank is that “The National Practitioner Databank is a public arena for displaying a history of medical errors committed by a clinician.” Upon research of the National Practitioner Databank, it was discovered that the databank serves as a clearing-house for clinicians that were involved in a medical error that resulted in any form of payment to an individual and only authorized healthcare personnel offices can gain access to the databank. Credentialing is required every two years for clinicians in the United States and the National Practitioner Data Bank serves this purpose.

It was expected that there would be an increase in the number of reported medication errors from pre to post survey in the intervention group. In fact, there

was a 100% increase in the reported medication errors from pre to post. It is possible that the post survey reported medication errors were errors made by the same pharmacist(s) that reported the error in the pre-survey. It is also possible that a new generation of pharmacists emerged after partaking in this study and decided to do what is right and report the medication errors. It is also possible that a stronger set of interventions might have resulted in a more significant difference.

As expected, individuals with greater fear of reporting errors had lower company culture scores on average than individuals with less fear. Those who said that they would not report an error immediately had lower score averages than those who said they would report the error immediately. This proved true for Scale 1(integrity/humanistic culture). When the data were collected, coded, and then tallied for the number of true responses, it was determined that the organization studied as part of this dissertation possessed an integrity/humanistic workplace culture. In this type of culture, pharmacists tend to be honest and they consider integrity to be at the top of the list. The pharmacy encourages a nurturing environment and upper-level management communicates clearly as well as frequently to employees. As with every type of culture, there are advantages as well as disadvantages. Although honesty is an excellent policy, too much information can be damaging. The pharmacists in the company studied are loyal to what is right, not to the organization.

A highlighted pitfall characteristic of the integrity/humanistic culture is that the organization studied should be aware of the cultural implications of fostering

a God-like environment that may bring religion into play when making work-related decisions. The term, God-like is explained in the King James version of the Holy Bible, Deuteronomy 32:4 states, “He is the Rock, his work is perfect: for all his ways are judgment: a God of truth and without iniquity, just and right is he.” This implies that God is perfect, righteous, and just. God is perfect, meaning that he makes no mistakes. God is righteous, meaning that He will not pass over wrongdoing. God is just, meaning that He is fair. These attributes are what could potentially be used in the decision making of work-related issues. Thus, being God-like in the realm of practicing pharmacy could lead to error. For instance, a pharmacist acting in a God-like capacity could potentially convince himself that he knows the best medicinal therapy for a patient regardless of what research exists to dispute his claim. Just like God, the pharmacist is omniscient. This event could potentially lead to error in pharmacy.

The researcher thought it would be interesting to see the actual group average score changes from pre to post survey for all six scales. The group average score changes are located in Table 6.1. The smallest percentage change (0.30) occurred in the intervention group on Scale 3 while the largest change (10.10) occurred in the control group on Scale 3. Please note that Scale 3 refers to an innovative culture. This is a quite interesting revelation that the intervention group was 99.7% consistent with their responses from pre to post survey while the control group was 89.9% consistent with their responses from pre to post. This may lend itself to further investigation in a future study.

Overall, I conclude that we can reduce medication errors and improve systems, to make better choices. By installing fail-safes in all aspects of the pharmacy system and educating patients on their medicinal therapy, collaboration is promoted amongst key players including pharmaceutical companies, pharmacy managers, and legislators. Safer healthcare is the driving factor in effecting change within the entire delivery system of pharmaceuticals. The benefit to the world is literally life-saving. An educated patient is the best defense against a potential medication error. In addition, educated patients are intimately familiar with all aspects of medicinal therapy necessary for the sustainment of good health. Through implementation of a non-punitive culture, medication error reporting will increase initially, and subsequently decrease over a reasonable period of time.

Based upon the above conclusions, a road to having a non-punitive culture in pharmacy for medication errors was built (Figure 6.1). Utilizing Lewin's three phases – Unfreezing, Changing, Refreezing - of planned change (Schermerhorn Jr., 1996) the development of a non-punitive culture was structured. Steps a through e in Figure 6.1 are representative of Lewin's Phase I, Unfreezing. In Phase I, the goal is to create a felt need and preparation for change. Steps f through h is representative of Lewin's Phase II, Changing. Changing people, changing tasks, changing structure, and changing technology are instrumental in the success of Phase II. Training, group discussions, sharing of knowledge are essential to bring about change. Also motivation, exchange of ideas, and quality awareness forums are extremely critical to institutionalize the

change. Steps i through k are representative of Lewin's Phase III, Refreezing. In this phase, outcomes are reinforced, results are evaluated, and constructive modifications are made. Evaluation is a final key component in the refreezing phase. It gives the organization an opportunity to evaluate the successes and the failures of the implemented changes as well as an opportunity to institute a contingency plan to make constructive modifications. If the importance of the change is thoroughly understood at the ground level, then success will be achieved.

Although one culture type is not a fix all for every type of organization, development of a non-punitive culture requires a combination of culture characteristics. Collaboratively, the mixed-culture characteristics form an ideal workplace environment for the development of the non-punitive culture. Often times, a workplace culture is represented by more than one culture type. In fact, it was a combination of the six cultures that produced the characteristics of the non-punitive culture. The characteristics of a non-punitive culture and their culture of origin are outlined in Table 6.2. These characteristics were based upon at least an 80% favorable response rate (yes) to each survey question as it paralleled the description of the non-punitive culture described on the Non-Punitive Culture Information sheet (See Appendix F). The "yes" was in response to the described conditions of the pharmacist's work environment. There was over 80% response of "no" to Question 43, "Salary is more important to me than professional growth." This "no" response was included because it demonstrates that salary is not the governing factor in the pharmacists' career. The described

Table 6.1 Pre to Post Group Change

Scale	Group	Pre	Post	Change	% Change
Scale 1	Control	0.819	0.786	0.03	3.30
	Intervention	0.731	0.756	(0.03)	(2.50)
Scale 2	Control	0.502	0.51	(0.01)	(0.80)
	Intervention	0.52	0.54	(0.02)	(2.00)
Scale 3	Control	0.639	0.74	(0.10)	(10.10)
	Intervention	0.63	0.633	(0.00)	(0.30)
Scale 4	Control	0.772	0.738	0.03	3.40
	Intervention	0.714	0.74	(0.03)	(2.60)
Scale 5	Control	0.731	0.763	(0.03)	(3.20)
	Intervention	0.752	0.766	(0.01)	(1.40)
Scale 6	Control	0.527	0.578	(0.05)	(5.10)
	Intervention	0.488	0.499	(0.01)	(1.10)

conditions covered the attributes of the six cultures evaluated in this dissertation. It was interesting to see that the “yes” response rate and the one “no” response rate were in line with the Non-Punitive Culture Information sheet.

Over 80% of the pharmacists surveyed responded favorably to Questions 6-10, 13, 15, 17, 20, 22, 26, 28, 32, 34, 35, 38, 42, and 43 (See Appendix E). A synopsis of the favorable response is stated in the following sentences. The environment and the organization in which they work supports full disclosure of medical errors. The pharmacists believed the patients should be made aware that a medical error has occurred. The reporting of medical errors to a federal agency will allow other clinicians to develop safety precautions in their system of work as well as reduce the number of medical errors overall. The pharmacists believe that a non-punitive culture will actually increase reporting of medical errors. In fact, the pharmacists feel comfortable in reporting a medical error to his/her supervisor. The pharmacists and the supervisors are most interested in quality care for the patient and patients concerns are addressed in a timely manner. In fact, the supervisors encourage new ideas about increasing patient safety. The pharmacists understand how their duties contribute to the success or failure of the organization. They seem to have a genuine interest because they expect to work at the organization for their whole careers. When there is a conflict, they believe in working out differences before going to the supervisor. The job meets the professional expectations of the pharmacists and personal growth is more important than salary. The pharmacists associate with people from a wide variety of professional and personal backgrounds.

One of the main characteristics of the non-punitive culture is truthfulness which leads to openness and disclosure of a medication error. According to Partnership for Health and Accountability (July 2004), a major goal in a non-punitive culture is to create a culture where people come forward when errors occur. According to Optimum Motivation Coaching (n.d.), when staff feel secure and nurtured in their work environment they perform better. Further, when people feel they are treated fairly they remain loyal to the company and motivated by their work. Likewise, in pharmacy, when pharmacists are nurtured in their work environment, they are more apt to develop a deep sense of care about the organization's mission and work hard to achieve the organizational goals. Just as clinicians have to make recordings in the patient record that can only be interpreted in one way (Pharmacy Law and Management Conference, 2002), upper-level management has to communicate clearly and effectively to the pharmacists. Once a hospital has assessed its culture of patient safety, the leadership can decide which dimensions provide the best opportunity for interventions within that organization (Partners for Health and Accountability, July 2004). The non-punitive culture wants to avoid disruption, although not completely possible, so processes are put in place to address most situations. Although the pharmacists are empowered to make decisions when they do encounter situations not addressed in the policy manual, they consider the issues carefully as well as communicate them effectively to management. Pharmacists are hard workers and are paid relatively well as a sign of compensation for doing an invaluable humanistic-type job. Salary.com, Inc. (n.d.) lists the median salary

for a typical pharmacist in the United States as $100,720. Over the course of employment, pharmacists are encouraged to attend formal training to stay abreast of new technology and to share information about medication errors without the fear of punishment. Most states require the pharmacist complete approximately 15 hours of continuing education each year (http://www.pharmacist.com/articles/l_t_0001.cfm).

The non-punitive culture was built out of respect for pharmacists, patients, and other clinicians with the intent to increase the quality of work life for pharmacists and other clinicians. Additionally, it was developed with the intent for the patient to realize his/her role in the quest for wellness so that the patient can maintain or improve his/her quality of life. Pharmacists do not set out to make a medication error, it is simply the system way of doing things that allows a medication error to happen. A system's approach was utilized in the development of the non-punitive culture. Until the system's approach has been globally accepted by all pharmacists, pharmacy managers, pharmacy governing boards, pharmaceutical companies, and other clinicians, unfortunately, the reported medication error rate will continue to be low and inaccurate. Changing structure, tasks, or technology of any organization will change the behavior and/or satisfaction of its members (Reitz, 1987). An organizational culture change to a non-punitive culture is instrumental in ridding our nation of preventable medication errors. Wachter stated that, "while there are many potential solutions to the problem of medical errors, I think the cultural change

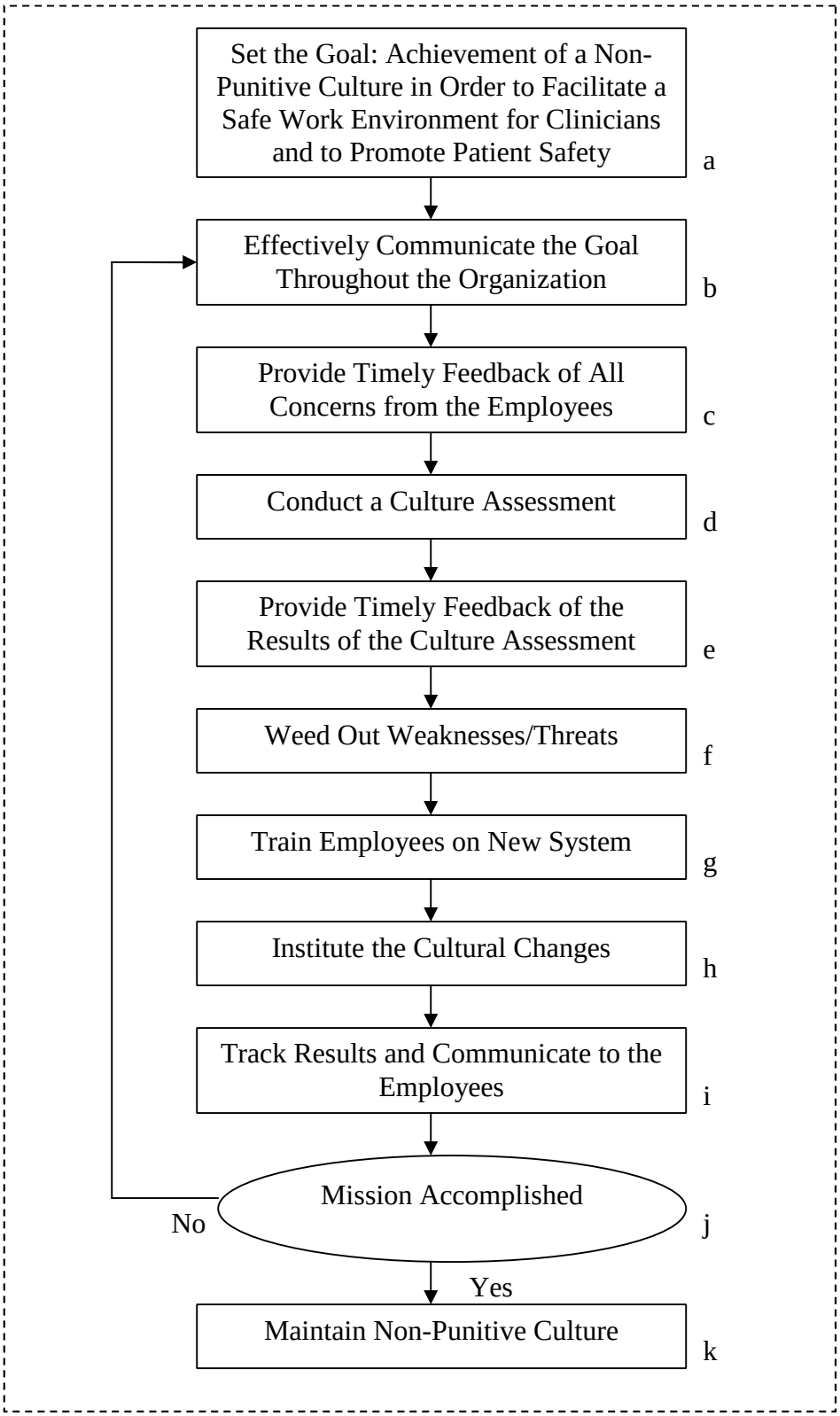

Figure 6.1 Pathway to Non-Punitive Culture

will turn out to be the best and most lasting investment that can be made" (Olsen, 2004). Establishing a culture that supports the reporting of errors without fear and/or shame is crucial to creating an effective reporting system.

Table 6.2 Non-Punitive Culture Characteristics and Origin

Characteristics	Culture of Origination
1) Honest entity 2) Integrity at top of the list 3) Encourages a nurturing environment 4) Upper-level management communicates clearly and frequently to employees	Integrity/Humanistic
5) Quality-oriented 6) Hard workers	Efficiency/Quality-oriented
7) Many formal systems that allow the employee to feel empowered to communicate ideas	Innovative
8) Intellectual and thoughtful 9) Considers issues carefully	Deliberative
10) Company has processes in place to address most situations 11) Cultivate employees by encouraging development through mentoring programs and/or formal training opportunities 12) Compensates employees relatively well	Established/Stable
13) People care deeply about the firm's mission and work hard to achieve the organization's goals	Urgent/Seat of the Pants

6.3 Technological Insight into the Advancement of Medicine

Since the 1999 Institute of Medicine report, some have said that the healthcare industry has been slow to make technological advancements in the realm of patient safety in order to reduce the number of medical errors. Yet, research shows (Bates DW et al. Effect of computerized physician order entry and a team intervention on prevention of serious medication errors. *JAMA* 1998;280:1311-16) that over half of all medication errors can be prevented through computerization of physician order entry (ISMP, March 2001). Technology exists today that will allow for a much safer healthcare industry.

Either no one has thought of how to combine today's technology to solve a multi-fold pharmacy/pharmaceutical problem or technological advancements in healthcare are painstakingly slow. Although some of the proposed technology is in operation today, collectively, as a unit, the meeting of all facets of the technology proposed has not occurred.

What is being proposed is the collaboration of existing technology to produce an error-free medication system. The day will come when insurance agencies will deliver a prescription card that serves as a gateway to better quality healthcare. This prescription card will be universal in its acceptance at any pharmacy. This prescription card will be the product of collaboration between pharmaceutical companies, prescribing clinicians, and pharmacists. The pharmaceutical companies will work hand-in-hand with pharmacies and those clinicians with prescribing rights. The pharmaceutical companies will develop a database of all drugs to include a photo, route(s), dosage, and indication. When a patient goes to the doctor's office and the doctor prescribes a drug, the doctor will retrieve the name of the medication out of the database, select the route, dosage, and select/record the indication. The doctor will then scan the patient's prescription card so that the patient's card will contain the full name of the medication, a colored picture of the drug, dosage, route, and indication. The patient goes to the pharmacy to pick-up his/her prescription. The pharmacy technician scans the prescription card and this is where the automated double-check system begins. Independent double checks serve two purposes: to hopefully, though not dependably, detect a serious error before it reaches a

patient; and just as important, to bring attention to the systems that allow the introduction of human error (ISMP FAQ, n.d.). The prescription is then filled. During the filling process, by use of an automated machine, a picture of the drug being filled is taken and compared to both the database drug photo and the drug photo from the scanned prescription card. This creates a three-way automated system check on the prescribed drug. The prescribed drug, inclusive of the full name of the medication, purpose of the medication, dose, and route is then delivered to the patient. Legislation should require that the medication's purpose and full instructions be written on each new prescription so that pharmacists can educate patients properly and prevent errors if the purpose and prescribed drug do not match (ISMP, March 2001).

As it stands in 2006, there are no laws governing prescription labeling that mandates the purpose and/or full instructions on the label. Until there is public outcry, there is no foreseen voluntary change in the medical community to produce beneficial information on prescription labels.

6.4 Recommendations

The recommendations are from a systemic point of view for all aspects of the medication delivery system. When the term system is used, most seem to think that the reference is specific to equipment. However, the pharmacy system is inclusive of the following:

1) pharmaceutical companies that process and package the drugs – unit dose processing and packaging
2) delivery of the drugs to the pharmacy – box labeling and receiving procedures

3) the storage of the drugs – clearly labeled and organized so as to accommodate a floating pharmacist
4) operating procedures of the pharmacy – clear and comprehended by all pharmacy staff
5) pharmaceutical governing boards – communicates changes, provide training/workshops
6) top-level management at the pharmacy – communicates clearly and provides timely feedback
7) workplace policies and procedures – fathomed by all pharmacists
8) interaction with the varied professionals as related to patient wellness – positive group dynamics
9) equipment that is used in pharmacy – pharmacists are intimately familiar with the operation of all equipment used in pharmacy
10) prescribing clinicians – electronically order prescription
11) pharmacists – knowledgeable, skilled, and trained
12) pharmacy technicians – knowledgeable, skilled, and trained
13) delivery of prescriptions – prescription card check
14) workplace culture – non-punitive environment
15) interaction with patients – open and honest
16) pharmacy layout – maximize productivity, increase efficiency, maintain quality
17) pharmacy job design – intimately familiar with all aspects of how to do the job
18) patient – involved in his/her care

Together, these components work together to produce a high performance system. Successful collaboration requires building trust and using consensus-building processes, actively engaging key players and all stakeholders, staying focused on the shared goal of improving patient safety, and learning from others active in the field (AHRQ, June 2001). According to the United States Department of Veterans Affairs: “Culture Change Prevention, Not Punishment”, it can only happen as a result of effort on everyone's part to take a different approach to the way we look at things. If any one of the 18 components of a pharmacy system is compromised, the end result could potentially lead to a medication error. Media reports of failures of quality, state board pharmacy

activities that punish pharmacists who err, and sizable jury verdicts against pharmacy chains for easily preventable errors, have created a demand for systematic approaches to increase quality and reduced exposure to liability (Pharmacy Law and Management Conference, 2002).

Adherents of the system approach strive for a comprehensive management program aimed at several different targets: the person, the team, the task, the workplace, and the institution as a whole (Reason, 2000). An emphasis on prevention via a systems approach, in its entirety, is what is needed to attain significant improvements in patient safety throughout the United States, as a direct result of increased reporting of medication errors in a non-punitive culture.

6.4.1 Responsibility

There needs to be more responsibility in the prescribing, dispensing, and administering of drugs. This responsibility should be three-fold to include the doctor, the patient, and the pharmacist. In the event of an incapacitated patient, a designated proxy will act on his/her behalf. The relationship between the doctor and the patient should be one where the doctor communicates the treatment plan for the patient to the patient. The part of the treatment plan that requires medication should be explicit and address all the patient's concerns. The doctor should tell the patient what he/she is prescribing and what each medication is for. Additionally, the doctor should provide a color copy of the drug from the database (mentioned in Section 6.3) to include the purpose for the drug. The patient should then be responsible for validating exactly what the doctor

ordered. Then the patient goes to the pharmacy to get the prescription filled. Section 6.3 explains the dispensing of drugs. To take it a step further, when the prescription is ready for pick-up, the patient should have to validate that the 3-way comparison photo (scanned prescription card photo/database photo/actual photo) is correct. To handle the responsibility of administering drugs, patient counseling should be required for all new prescriptions. The counseling should be validated by the patient, prior to the patient accepting the prescription. An educated patient or caregiver can be a crucial last check on the safety of any medication (ISMP, March 2001). Having the patient validate what the doctor prescribed, what the pharmacist dispensed, and how the drug should be administered may reduce or eliminate liability for both doctor and pharmacist. Now, a misdiagnosis by the doctor is a completely different set of circumstances which was not covered in this research.

6.4.2 Further Research

While this study provided many insights into the workplace culture and moral make-up of pharmacists in an organization, this study has some limitations as well. Only one facility was investigated. Not every available pharmacist participated in this study. Another area that might lend itself to further investigation would be determining the workplace culture of similar facilities to determine if similar results are obtained. As well, determining the workplace culture of those individuals/entities – pharmaceutical companies, other prescribing clinicians, pharmacy governing boards, nursing staff - of which pharmacists interact would be interesting. Further research might include

following a medication error via the route of the workplace culture as part of the root cause analysis. Root cause analysis typically involves individuals involved in the error and does not address the issue of the workplace environment nor the complete system.

This study addressed the pharmacists' moral make-up as it pertained to the workplace culture in regards to truthfulness, other factors outside of the workplace could shed additional light on the pharmacists' limitations of truthfulness. Although pharmacists are human, the public seems to think pharmacists should be infallible at work. A 2004 Hillsborough County, Florida, general election ballot listed a constitutional amendment that would give patients the right to review, upon request, records of health care facilities' or providers' adverse medical incidents. On the same ballot, there was a proposed constitutional amendment that would prohibit medical doctors who have been found to have committed three or more incidents of medical malpractice from being licensed to practice medicine in Florida. Further research might include obtaining the public's opinion on disclosure of all workplace errors, whether a pharmacist, doctor, lawyer, beautician, cashier, politician, clergyman, chef, etc.

As technology advances, the ability for a system to produce an error will lessen. Further research might include obtaining the public's view on the use of biotechnology to obtain prescriptions. Instead of using a prescription card to obtain prescriptions, the use of a scanned fingerprint and/or eye scan could directly identify the person for whom the prescription is intended. Only time will tell how receptive the public is to these views.

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Appendices

Appendix A: Historical Perspective

Table A.1 Historical Perspective

DATE	INDIVIDUAL(S)/ ORGANIZATION(S)	ACTIONS	OUTCOMES
1976	U.S. House of Representatives' Subcommittee on Oversight and Investigation of the Committee on Interstate and Foreign Commerce	Issued its report, "Cost and Quality in Health Care: Unnecessary Surgery."	Estimated that there were some 2.4 million unnecessary operations every year, with as many as 11,900 deaths attributed to these unneeded operation
1984	The Harvard Medical Practice Study	Looked at over 30,000 hospitalizations in New York State	Approximately 27,000 individuals die each year in New York hospitals alone as a result of preventable medical errors.
1997	Representative William Coyne (D, Pennsylvania)	Introduced the Safe Medications Act of 1997	Required that health facilities report deaths from drug errors. The bill would impose a fine of $15,000 for each unreported death and exclude those facilities convicted of failing to report a death from receiving Medicare and state health-care payments
1997	President Clinton and Vice President and the Office of Personnel Management	Established the Advisory Commission on Consumer Protection and Quality in the Health Care Industry (Quality Commission) and launched the National Forum for Health Care Quality Measurement and Reporting.	Developed standard quality measurement tools to help purchasers, providers, and consumers better evaluate and ensure the delivery of health care services.

Appendix A: (Continued)

Table A.1 (Continued)

1998	President Clinton's Advisory Commission on	Release the final report on Consumer Protection and Quality in the Health Care Industry	Identified medical errors as one of the four major challenges facing the Nation in improving health care quality
March 1998	President Clinton	Established the Quality Interagency Coordination Task Force (QuIC)	Respond to the IOM report with recommendations on improving health care quality and protecting patient
1999	Institute of Medicine	Issued a report, "To Err is Human: Building a Safer Health System	Medical errors are the 8th leading cause of death in America. An estimated 44,000 to 98,000 deaths occur each year in the U.S. as a result of medical errors.
December 1999	President Clinton	Directed the Health Care Quality Task Force to analyze the Institute of Medicine study	Concur with IOM recommendations
1999	James Jeffords, VT Mike Enzi, WY Bill Frist, TN	Introduced a bill to amend the Public Health Service Act to reduce medical mistakes and medication-related errors and referred to the Senate Labor, Health, Education and Pensions Committee	Amended current law to reduce medical mistakes and medication-related errors by creating a Center for Quality Improvement and Patient Safety to track medical mistakes and best practices.

Appendix A: (Continued)

Table A.1 (Continued)

1999	Edward Kennedy, MA Patty Murray, WA Christopher Dodd, CT	Introduced Voluntary Error Reduction and Improvement in Patient Safety Act and referred to the Senate Labor, Health, Education and Pensions Committee	Amended current law to develop the Center for Quality Improvement for Patient Safety to direct a national voluntary reporting system, research and dissemination of critical information.
2000	QuIC Response	Endorsed virtually every IOM recommendation proposed	President called for a mandatory reporting system in the 500 military hospitals and clinics serving over 8 million patients; and a phased-in nationwide state-based system of mandatory and voluntary error reporting
Feb. 23, 2000	Connie Morella, MD Brian Baird, WA Donald Manzullo, IL Ron Paul, TX Thomas Tancredo, CO Phil English, PA Dennis Moore, KS Joseph Pitts, PA Tom Udall, CO	Introduced Medication Error Prevention Act of 2000 and referred to the House Committee on Commerce Subcommittee on Health and Environment	Amended current law to reduce medication-related medical errors by providing for voluntary reporting by health care providers of medication error information in order to assist appropriate public and nonprofit private entities in developing and disseminating recommendations and information.

Appendix A: (Continued)

Table A.1 (Continued)

Feb. 28, 2000.	Arlen Specter, PA Tom Harkin, IA Daniel Inouye, HI	Introduced Medical Error Reduction Act of 2000 and referred to the Senate Committee on Health, Education, Labor, and Pensions	Amended current law to reduce accidental injury and death resulting from medical errors including establishing 15 demo projects in an effort to develop a model for medical error reduction and reporting.
April 6, 2000	Charles Grassley, IA Richard Byran, NV Joseph Lieberman,CT Robert Kerrey, NE	Introduced Stop All Frequent Errors in Medicare and Medicaid Act of 2000 and referred to the Senate Committee on Finance	Amended the Social Security Act to improve the safety of Medicare and Medicaid.
March 2001	Michael R.Cohen, MS, RPh President of ISMP	Presented before Congress. Medicare Reform: Laying the Groundwork for a Prescription Drug Benefit	Underutilized technology. Recommended incentives for facilities that adopt technology known to reduce medication errors.
July 2001	Joint Commission on Accreditation of Healthcare Organizations (JCAHO)	Adopted new standards	Safety programs must include systems for responding to medical errors and for internal and external reporting.
July 2001	JCAHO	Revised its patient's rights standard	Required to inform patients and families about the outcomes of care, including adverse events
August 2002	President Bush	Called for medical liability reform	See July 2003 Outcome Comments

Appendix A: (Continued)

Table A.1 (Continued)

2002	JCAHO	JCAHO reviews Emergency Care Documentation System and pronounced EmpowER a “success story and role model” In Accreditation Issues for Emergency Departments	Discharge instructions are now available in six languages in addition to English, and automatically print out in the patient's native language
2002	Food and Drug Administration	Introduced Performance Plan: Reduce Adverse Events Related to Medical Products	Goal is to develop and enhance surveillance of FDA-regulated products to identify harm resulting from use, understand harm through expert analysis, and prevent harm to other patients by taking action
January 2003	President Bush	Bush urged Congress to protect America's patients, doctors, and hospitals from the staggering costs of out-of-control lawsuits by passing important medical liability reforms	See July 2003 Outcome Comments
April 29, 2003	President Bush	Proposals for Health Security in the World's Best Health Care System for Patients’ Bill of Rights	Strongly supports the passage of a Patients' Bill of Rights that leaves medical decisions in the hands of physicians, instead of insurance companies
July 9, 2003	President Bush	Senate’s Response to Medical Liability Reform	President disappointed with Senate’s failure to pass Medical Liability Bill
December 2003	Food and Drug Administration	Sought bar-code system in bid to cut down on medical errors	Goal is to use bar-coding technology on drugs to reduce hospital medical errors and deaths

Appendix A: (Continued)

Table A.1 (Continued)

June 2004	President Bush	Discussed use of wireless and broadband technology in healthcare	Goal is to streamline the use of technology in providing faster, accurate and better care.
January 27, 2005	President Bush	Bush participates in an event on health care information technology at the Cleveland Clinic in Cleveland, Ohio	Bush pushes the use of computerized medical records
June 29, 2005	Mr. Enzi and Mr. Baucus 109th Congress	Fair and Reliable Medical Justice Act introduced in Senate	To restore fairness and reliability to the medical justice system and promote patient safety by fostering alternatives to current medical tort litigation, and for other purposes
July 29, 2005	President Bush	Bush signs law to create medical-errors database	A national database on medical errors, designate individual reports as confidential and shield participating providers from liability

Appendix B: Summary of Congressional Response to IOM Report

The response to the IOM report by Congress was heard in a Joint Hearing of the Committee on Health, Education, Labor, and Pensions (HELP) and the Subcommittee on Labor, Health and Human Services, and Education. President Clinton released a plan for a nationwide, state-based system of reporting medical errors to be phased-in over time. The plan included mandatory reporting of preventable medical errors that cause death or serious injury, and voluntary reporting of other medical mistakes and "near misses," or "close calls." The Clinton-Gore Administration (2000) worked with the National Quality Forum, a private-public group of health care experts, to develop a set of patient safety measurements that would lay the foundation for a uniform system of reporting errors. Information will be aggregated and made public (without identifying patients or individual health care professionals) to educate the public about the safety of their health systems. President Clinton described these efforts as a balanced, common-sense approach based on prevention, not punishment; on problem-solving, not blame-placing.

As put by Senator Christopher Dodd, the IOM study revealed a major health crisis-not a deadly new virus or another tear in the safety net-but a crisis of human error. Further, he stated that most Americans feel confident that the health care they receive will make them better-or at the very least, not make them feel worse. And in the vast majority of circumstances, that confidence is deserved.

Appendix B: (Continued)

Senator Edward Kennedy stated that any legislation put forward will not effectively reduce medical errors unless it holds institutions accountable for implementing practices and standards that improve patient safety. The public deserves meaningful information about how well individual health care institutions perform on patient safety measures, so that patients can make informed choices.

Senator James Jeffords, Chairman of Committee on Health, Education, Labor, and Pensions stated that the ideal reporting system must be non-punitive, voluntary, confidential, and de-identified.

It is the view of Senator Arlen Specter that there should be a professional responsibility by doctors and hospitals to tell people when they have been injured. It may be that in the long run, that the disclosure of errors can lead to a way to deal with this problem which would be different from the current tort system of medical malpractice, and perhaps those who are injured could be compensated in some other way, like perhaps workmen's compensation without respect to fault.

Appendix C: What Is Your Corporate Culture?

Quiz: What Is Your Corporate Culture?
Corporate culture is a complex subject. Yet analyzing your company's culture can help you create a plan to improve it. This 15-question survey has been developed to serve as a starting point for your analysis.

by Debra Woog McGinty and Nicole C. Moss

Corporate culture is a complex subject. Yet analyzing your company's culture can help you create a plan to improve it.

This 15-question survey has been developed to serve as a starting point for your analysis.

Answer each true/false question according to what is true most of the time. And answer based on how your organization actually acts -- not how you would like it to be.

True/False Questions

1) I know how my projects contribute to the success or failure of our organization.
2) Management here makes lots of announcements to employees.
3) I have colleagues from a wide variety of professional and personal backgrounds.
4) In this organization, people who are not ready to be promoted after a certain length of time at their level are generally encouraged to leave.
5) Departments or teams compete with each other for our organization's resources.
6) When people are not getting along here, it's a long time before we directly address the issue.
7) When it's time for me to learn a new skill, training is readily available at no cost to me.
8) When the boss tells us to "jump!" we ask "how high?"
9) It takes a long time for this organization to address customer concerns.
10) Many employees expect to work at this organization for their whole careers.
11) Senior management says the door is always open -- and they mean it.
12) It is fun to work here.
13) We have three or fewer layers of management.
14) We have performance reviews less than once a year.
15) Compensation and benefits are relatively low here.

Count your "True" responses in each third of the quiz (questions 1- 5, 6-10, 11-15). The section in which you have answered "True" the most times corresponds to the culture type your organization most closely matches. If you have the same

Appendix C: (Continued)

number of "True" responses in more than one section, your culture matches this combination of types. On the next page, you'll find a list of primary advantages and potential pitfalls of each one.

For questions 1-5:

If you had the most "True" responses in this set of questions, your company has a *Deliberative/Traditional culture*.

Advantages:
1) This culture tends to be intellectual and thoughtful.
2) People in this type of organization often consider issues carefully prior to making a change.
3) The organization likely has many formal systems, yet flexibly forms and reforms teams in accordance with immediate client needs.
4) Senior management communicates frequently to employees.

Pitfalls:
1) Although plenty of communication usually flows from the top of this organizational type, management often does not indicate interest in feedback from all levels. Beyond making announcements from management, ask for regular feedback so you don't miss critical information and/or valuable innovations from your staff.
2) Be careful that your organization doesn't discuss change for so long that you miss important opportunities to change for the better.
3) This cultural type regularly hires groups of new employees, generating a valuable flow of diverse talent with fresh perspectives.
4) Be aware of the cultural implications of fostering competition within a company. Internal competition may create resentment that drives costly turnover.

For questions 6-10:

If you had the most "True" responses in this set of questions, your company has an *Established/Stable culture*.

Advantages:
1) This organization has most likely been around for a long time and/or is a family business. These organizations tend to have solid institutional memories, so they are likely not to waste resources by repeatedly "reinventing the wheel".
2) This type of company has processes in place to address most situations.
3) Organizations of this type tend to cultivate employees by encouraging development through mentoring programs and/or formal training opportunities.
4) This culture type is known for compensating its people relatively well.

Appendix C: (Continued)

Pitfalls:
1) Typically this type of organization struggles to handle conflict well, often becoming either conflict avoidant or "command and control." If your organization tends to be conflict avoidant, it may be time to address those problems that are out of hand, or that have been out of hand in the past.
2) "Command and control" style leadership may yield feelings of disconnectedness among employees. Consider assessing employee morale immediately.
3) Overall, this culture type tends to be wary of turnover, so take a careful look at your organization and consider whether it's holding on to people who might best be let go.
4) While established systems can be a positive sign of organizational health, make sure your processes are focused toward addressing customer needs in a timely matter. If your processes impede rapid resolution of customer problems, rework them right away.

For questions 11-15:

If you had the most "True" responses in this set of questions, your company has an *Urgent/Seat of the Pants culture*.

Advantages:
1) This culture type features a positive work environment, with tight bonds among employees.
2) It is likely that an aspect of your organization's mission includes responding to crisis. People care deeply about the firm's mission and work hard to achieve the organization's goals.
3) Employees who frequently hurry to beat the clock can create great results in a short time, provided that quality is a strong value in your organization.
4) These organizations tend to have a flat structure that fosters communication and collaboration among employees and speeds the decision-making process.

P*itfalls:*
1) Caution: minimum rewards (both tangible and intangible) and minimum feedback are common to this culture type. Rewards and recognition are important not only to generate loyalty but also to foster collaboration.
2) The constant rush to get things done quickly can lead to burnout and increase the ever-present danger of losing talent.
3) Although this type of culture generally features frequent upward communication and grassroots change, top-down communication tends to be inadequate. Beyond staying accessible, take time to share important messages and expectations with your entire staff to keep them motivated and moving in the right direction.

Appendix C: (Continued)

4) Making decisions under intense time pressure may lead to a reduction in the quality of your products or services.

Is your culture type consistent with your expectations? If so, you probably have a good handle on how your company behaves, its primary cultural drivers, and how to make improvements where necessary.

Is your type different from what you thought it would be? If so, you might have an unrealistic perception of your company's character and values. Take a closer look at your answers above, and use the questions themselves as a guide to shifting your organization's behaviors toward becoming the type of culture you would like to see.

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Appendix D: Data Assessment Measures

Count your "True" responses in each section of the survey (questions 2-13, 14-19, 20-25, 26-30, 31-35, 36-43). The section in which you have answered "True" the most times corresponds to the culture type your organization most closely matches. If you have the same percentage of "True" responses in more than one section, your culture matches this combination of types.

For questions 2-13:

If you had the most "True" responses in this set of questions, your company has an *Integrity/Humanistic culture*.

Advantages:
This culture tends to be an honest entity.
1) People in this type of organization consider integrity to be at the top of the list.
2) The organization likely encourages a nurturing environment.
3) Upper-level management communicates clearly and frequently to employees.

Pitfalls:
1) Although honesty is an excellent policy, too much information can be damaging.
2) People in this type of organization are loyal to what is right, not to the organization.
3) Be aware of the cultural implications of fostering a God-like environment that may bring religion into play when making work-related decisions.

For questions 14-19:

If you had the most "True" responses in this set of questions, your company has an Efficiency/Quality Oriented *culture*.

Advantages:
1) This culture tends to be quality oriented.
2) People in this type of organization tend be hard workers.
3) The organization likely has many informal systems that allows the employee to do what he/she needs to do to get the job done.

Appendix D: (Continued)

4) Upper-level management communicates priorities frequently to employees.

Pitfalls:
1) Although quality should be at the top of the list, if the organization moves efficiency to the bottom of the list, negative return on investment will occur.
2) Be careful that your organization's informal systems may be used against the organization in lieu of an error.
3) Be aware that communication should flow in both directions. It is important to listen to your employees. A hire turnover can exist if employees are not listened to.
4) Be aware that communication should flow in both directions. It is important to listen to your employees. A hire turnover can exist if employees are not listened to.

For questions 20-25:

If you had the most "True" responses in this set of questions, your company has

an *Innovative culture*.

Advantages:
1) This culture tends to be innovative.
2) People in this type of organization often view issues as creative challenges.
3) The organization likely has many formal systems that allows the employee to feel empowered and to communicate ideas.
4) This cultural type regularly hires new employees that are thinkers and doers.
5) Upper-level management communicates frequently to employees.
6) Employees communicate frequently to upper-level management.

Pitfalls:
1) Although innovation is good, too many thinkers may begin to compete with each other and lose track of what is important.
2) Be careful that your organization doesn't discuss change for so long that you miss important opportunities to change for the better.
3) Be aware of the cultural implications of fostering competition within a company. Internal competition may create resentment that drives costly turnover.

For questions 26-30:

If you had the most "True" responses in this set of questions, your company has

a *Deliberative/Traditional culture*.

Appendix D: (Continued)

Advantages:
1) This culture tends to be intellectual and thoughtful.
2) People in this type of organization often consider issues carefully prior to making a change.
3) The organization likely has many formal systems, yet flexibly forms and reforms teams in accordance with immediate client needs.
4) This cultural type regularly hires groups of new employees, generating a valuable flow of diverse talent with fresh perspectives.
5) Senior management communicates frequently to employees.

Pitfalls:
1) Although plenty of communication usually flows from the top of this organizational type, management often does not indicate interest in feedback from all levels. Beyond making announcements from management, ask for regular feedback so you don't miss critical information and/or valuable innovations from your staff.
2) Be careful that your organization doesn't discuss change for so long that you miss important opportunities to change for the better.
3) Be aware of the cultural implications of fostering competition within a company. Internal competition may create resentment that drives costly turnover.

For questions 31-35:

If you had the most "True" responses in this set of questions, your company has

an *Established/Stable culture*.

Advantages:
1) This organization has most likely been around for a long time and/or is a family business. These organizations tend to have solid institutional memories, so they are likely not to waste resources by repeatedly "reinventing the wheel".
2) This type of company has processes in place to address most situations.
3) Organizations of this type tend to cultivate employees by encouraging development through mentoring programs and/or formal training opportunities.
4) This culture type is known for compensating its people relatively well.

Pitfalls:
1) Typically this type of organization struggles to handle conflict well, often becoming either conflict avoidant or "command and control." If your organization tends to be conflict avoidant, it may be time to address those problems that are out of hand, or that have been out of hand in the past.
2) "Command and control" style leadership may yield feelings of disconnectedness among employees. Consider assessing employee morale immediately.

Appendix D: (Continued)

3) Overall, this culture type tends to be wary of turnover, so take a careful look at your organization and consider whether it's holding on to people who might best be let go.
4) While established systems can be a positive sign of organizational health, make sure your processes are focused toward addressing customer needs in a timely matter. If your processes impede rapid resolution of customer problems, rework them right away.

For questions 36-43:

If you had the most "True" responses in this set of questions, your company has

an *Urgent/Seat of the Pants culture*.

Advantages:
1) This culture type features a positive work environment, with tight bonds among employees.
2) It is likely that an aspect of your organization's mission includes responding to crisis. People care deeply about the firm's mission and work hard to achieve the organization's goals.
3) Employees who frequently hurry to beat the clock can create great results in a short time, provided that quality is a strong value in your organization.
4) These organizations tend to have a flat structure that fosters communication and collaboration among employees and speeds the decision-making process.

Pitfalls:
1) Caution: minimum rewards (both tangible and intangible) and minimum feedback are common to this culture type. Rewards and recognition are important not only to generate loyalty but also to foster collaboration.
2) The constant rush to get things done quickly can lead to burnout and increase the ever-present danger of losing talent.
3) Although this type of culture generally features frequent upward communication and grassroots change, top-down communication tends to be inadequate. Beyond staying accessible, take time to share important messages and expectations with your entire staff to keep them motivated and moving in the right direction.
4) Making decisions under intense time pressure may lead to a reduction in the quality of your products or services.

Appendix E: Final Revision of Survey

Please Provide the Last 5 Digits of Home Phone

_____

Building A Non-Punitive Culture in Pharmacy for Medical Error Reporting Questionnaire
Fill In 1 Answer for Each Question (1 of 3)

1. If I made a medical error, I would report it
O Immediately
O Only if someone saw me or knew that it could have only been me
O Only if it were a minor error (no patient harm)
O Only if it were a major error (serious harm to patient)
O Never

2. I would only feel comfortable reporting a medical error if I knew that there would not be any repercussions against me.
O true O false

3. I have personally reported a medical error.
O true O false

4. If Question 3 applies, I would report it again.
O true O false

5. If Question 3 applies, the medical error I reported was associated with this organization.
O true O false

6. The environment/section that I work in supports full disclosure of medical errors.
O true O false

7. I believe that this organization as a whole supports full disclosure of medical errors.
O true O false

8. Patients should be made aware that a medical error has occurred.
O true O false

9. Reporting medical errors to a federal agency would allow other clinicians to develop safety precautions in their system of work
O true O false

Appendix E: (Continued)

10. Reporting medical errors reduces the number of medical errors overall.
O true O false

11. I have heard of the National Practitioner Data Bank (NPDB).
O true O false

12. If Question 11 applies, I have a positive impression of the NPDB.
O true O false

13. A non-punitive culture will actually increase reporting of medical errors.
O true O false

Building A Non-Punitive Culture for Medical Error Reporting
Questionnaire
Fill In 1 Answer for Each Question (2 of 3)

14. My supervisor is most interest in getting the job done as fast as I can.
O true O false

15. My supervisor is most interested in quality care for the patients.
O true O false

16. I am most interested in getting the job done as fast as I can.
O true O false

17. I am most interested in quality care for the patients.
O true O false

18. The safety protocols that I have to follow slow down my job.
O true O false

19. The safety protocols that I follow add more efficiency to my job.
O true O false

20. My supervisor encourages new ideas about increasing patient safety.
O true O false

21. I have ideas that could increase patient safety.
O true O false

22. I feel comfortable reporting a medical error to my supervisor.
O true O false

Appendix E: (Continued)

23. I would be embarrassed if my colleagues found out that I made a medical error.
O true O false

24. It is people who make medical errors not the system.
O true O false

25. It is the system that fails that allows medical errors to occur.
O true O false

26. I understand how my duties contribute to the success or failure of our organization.
O true O false

27. Management effectively communicates in a way that meets the need of the staff.
O true O false

28. I have colleagues from a wide variety of professional and personal backgrounds.©
O true O false

Building A Non-Punitive Culture for Medical Error Reporting
Questionnaire
Fill In 1 Answer for Each Question (3 of 3)

29. Opportunity for advancement is based on performance rather than length of employment.
O true O false

30. Departments or teams compete with each other for our organization's resources.©
O true O false

31. When people are not getting along here, my supervisor addresses the issue in a timely manner.
O true O false

32. It is important for individuals to work out their differences before going to the supervisor.
O true O false

Appendix E: (Continued)

33. When it is time for me to learn a new skill, training is readily available at no cost to me.©
O true O false

34. Customer concerns are addressed in a timely manner.
O true O false

35. Many employees expect to work at this organization for their whole careers.©
O true O false

36. When I have a problem and my supervisor can't solve it, Chief/Assistant Chief say the door is always open – and they mean it.
O true O false

37. It is fun to work here.©
O true O false

38. My job meets my professional expectations.
O true O false

39. We have too many layers of management.
O true O false

40. The Service needs more supervision.
O true O false

41. Performance reviews are comprehensive and adequately access my performance.
O true O false

42. Salary and benefits are relatively low here compared to others in my profession.
O true O false

43. Salary is more important to me than professional growth.
O true O false

Appendix F: Non-Punitive Culture Information

The Institute for Safe Medication Practices defines a non-punitive environment as a confidential reporting system where everyone understands that errors will not be linked to an individual's performance. Furthermore, in a non-punitive reporting system no criminal action and no disciplinary measures will be undertaken against the reporter on the basis of information contained in submitted reports. The intent of a non-punitive culture for medication error reporting is to encourage staff to report medication errors whether it is a near miss or death. In a non-punitive environment, medication errors are classified as system-based errors. These system-based errors can be defined as a flaw in the system of medicine, i.e. reading the wrong prescription on a script, administering the wrong medication because the bottles looked alike or the names sound alike, dispensing medication to the wrong patient, etc. System-based errors exist in all healthcare facilities.

In the proposed non-punitive culture, system-based medication errors are reported and the reporter has the option of either complete anonymity (does not identify the facility nor the staff member(s) involved) or disclosure of his/her identity which would not be available outside of the facility. The purpose of disclosure would be to derive facts in the investigation process for further clarification. What is of utmost importance is how the error occurred and what measures need to be instituted to eliminate the system-based error from repeated occurrence. It is important that system-based errors be reported as they occur in order to prevent future harm to patients.

Appendix F: (Continued)

Imagine a culture where you were not reprimanded for coming forth with an error that involved you. Imagine a culture where you could offer suggestions as to how to get a task done that would eliminate any possible harm to the patient. Imagine a culture where management listens to your problems and respect your proposed solutions. Imagine a culture where pharmacists from across the world could share system-based error information with one another and remain anonymous. Imagine a system that provided timely feedback to show how the reported errors saved lives. Imagine a system where there would be no more blame and shame but, honor and praise. Imagine a system where patients were informed in a timely manner (less than 24 hours) of a medication error and management and the facility director supported you 100 percent. Just imagine a culture of unstressed truth.

There is such a culture that exists, the non-punitive culture. It can be yours. A non-punitive culture offers a nurturing environment that is open to innovation, creativity, and change because fear of failing is not a limiting factor (http://www.mers-tm.net/training).

Appendix G: National Practitioner Data Bank (NPDB) Information

The Health Care Quality Improvement Act of 1986 authorized the Department of Health and Human Services to establish a National Practitioner Databank to collect and release certain information relating to inept, incompetent or unprofessional physicians, dentists, pharmacists and other health care practitioners.

The intent is to improve the quality of health care by encouraging State licensing boards, hospitals and other health care entities, and professional societies to identify and discipline those who engage in unprofessional behavior; and to restrict the ability of incompetent physicians, dentists, and other health care practitioners to move from State to State without disclosure or discovery of previous medical malpractice payment and adverse action history. Adverse actions can involve licensure, clinical privileges, professional society membership, and exclusions from Medicare and Medicaid.

The NPDB is primarily an alert or flagging system intended to facilitate a comprehensive review of health care practitioners' professional credentials. The information contained in the NPDB is intended to direct discrete inquiry into, and scrutiny of, specific areas of a practitioner's licensure, professional society memberships, medical malpractice payment history, and record of clinical privileges. The information contained in the NPDB should be considered together with other relevant data in evaluating a practitioner's credentials; it is intended to augment, not replace, traditional forms of credentials review.

Appendix G: (Continued)

Access to Information

Access to information in the NPDB is available to entities that meet the eligibility requirements as defined in the provisions of the NPDB regulations. In order to access information, entities must first register with the Data Bank.

NPDB information is not available to the general public. However, information in a form that does not identify any particular entity or practitioner is available.

Confidentiality

Information reported to the NPDB is considered confidential and shall not be disclosed except as specified in the NPDB regulations. The Privacy Act of 1974, protects the contents of Federal systems of records such as those contained in the NPDB from disclosure, unless the disclosure is for a routine use of the system of records as published annually in the Federal Register. The published routine uses of NPDB information do not allow for disclosure of information to the general public.

The Office of Inspector General (OIG), Health and Human Services (HHS), has the authority to impose civil money penalties on those who violate the confidentiality provisions of Title IV. Persons, organizations, or entities that receive information either directly or indirectly are subject to the confidentiality provisions and the imposition of a civil money penalty of up to $11,000 for each offense if they violate those provisions.

For additional information log onto www.npdb-hipdb.com

Appendix H: Tests of Within-Subjects Effects

Table A.2 Tests of Within-Subjects Effects

Scale	Source		Type III Sum of Squares	df	Mean Square	F	P
Scale 1	time	Sphericity Assumed	0	1	0	0.049	0.827
		Greenhouse-Geisser	0	1	0	0.049	0.827
		Huynh-Feldt	0	1	0	0.049	0.827
		Lower-bound	0	1	0	0.049	0.827
	Time * Group	Sphericity Assumed	0.016	1	0.016	3.155	0.084
		Greenhouse-Geisser	0.016	1	0.016	3.155	0.084
		Huynh-Feldt	0.016	1	0.016	3.155	0.084
		Lower-bound	0.016	1	0.016	3.155	0.084
Scale 2	time	Sphericity Assumed	0.004	1	0.004	0.283	0.598
		Greenhouse-Geisser	0.004	1	0.004	0.283	0.598
		Huynh-Feldt	0.004	1	0.004	0.283	0.598
		Lower-bound	0.004	1	0.004	0.283	0.598
	Time * Group	Sphericity Assumed	0.001	1	0.001	0.048	0.828
		Greenhouse-Geisser	0.001	1	0.001	0.048	0.828
		Huynh-Feldt	0.001	1	0.001	0.048	0.828
		Lower-bound	0.001	1	0.001	0.048	0.828
Scale 3	time	Sphericity Assumed	0.053	1	0.053	3.093	0.086
		Greenhouse-Geisser	0.053	1	0.053	3.093	0.086
		Huynh-Feldt	0.053	1	0.053	3.093	0.086
		Lower-bound	0.053	1	0.053	3.093	0.086
	Time * Group	Sphericity Assumed	0.047	1	0.047	2.71	0.108
		Greenhouse-Geisser	0.047	1	0.047	2.71	0.108
		Huynh-Feldt	0.047	1	0.047	2.71	0.108
		Lower-bound	0.047	1	0.047	2.71	0.108

Appendix H: (Continued)

Table A.2 (Continued)

Scale	Source		Type III Sum of Squares	df	Mean Square	F	P
Scale 4	time	Sphericity Assumed	0	1	0	0.013	0.91
		Greenhouse-Geisser	0	1	0	0.013	0.91
		Huynh-Feldt	0	1	0	0.013	0.91
		Lower-bound	0	1	0	0.013	0.91
	Time * Group	Sphericity Assumed	0.018	1	0.018	0.677	0.416
		Greenhouse-Geisser	0.018	1	0.018	0.677	0.416
		Huynh-Feldt	0.018	1	0.018	0.677	0.416
		Lower-bound	0.018	1	0.018	0.677	0.416
Scale 5	time	Sphericity Assumed	0.01	1	0.01	0.456	0.503
		Greenhouse-Geisser	0.01	1	0.01	0.456	0.503
		Huynh-Feldt	0.01	1	0.01	0.456	0.503
		Lower-bound	0.01	1	0.01	0.456	0.503
	Time * Group	Sphericity Assumed	0.001	1	0.001	0.066	0.798
		Greenhouse-Geisser	0.001	1	0.001	0.066	0.798
		Huynh-Feldt	0.001	1	0.001	0.066	0.798
		Lower-bound	0.001	1	0.001	0.066	0.798
Scale 6	time	Sphericity Assumed	0.019	1	0.019	1.159	0.288
		Greenhouse-Geisser	0.019	1	0.019	1.159	0.288
		Huynh-Feldt	0.019	1	0.019	1.159	0.288
		Lower-bound	0.019	1	0.019	1.159	0.288
	Time * Group	Sphericity Assumed	0.008	1	0.008	0.497	0.485
		Greenhouse-Geisser	0.008	1	0.008	0.497	0.485
		Huynh-Feldt	0.008	1	0.008	0.497	0.485
		Lower-bound	0.008	1	0.008	0.497	0.485

About the Author

Tamala Gulley received a Bachelor's Degree in Nuclear Engineering Science from University of Florida in 1994 and a M.E. in Civil Engineering from University of South Florida in 1996. Prior to and during the Ph.D. program, Mrs. Gully taught several math courses – College Algebra, Trigonometry, Calculus, Engineering Statistics - as an adjunct professor. She entered the Ph.D. program at the University of South Florida in Fall of 2000.

While in the Ph.D. program at the University of South Florida, Mrs. Gulley acquired some life-changing knowledge through courses taken within the Industrial Systems and Engineering Management Department. Mrs. Gulley believes that life is not about herself, but what she can give to others. She has been a mentor since 1999 and actively involved in the community since.