UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

THE EFFECT OF THE OSHA VOLUNTARY PROTECTION PROGRAM (VPP) AND ITS IMPACT ON SAFETY CULTURE: A CASE STUDY OF THE ILLESHEIM ARMY HEALTH CLINIC

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

DOCTOR OF PHILOSOPHY

By

CAROL A. FONTANESE
Norman, Oklahoma
2017

Downloaded from SHAREOK. Persistent Handle URL: https://hdl.handle.net/11244/50843

THE EFFECT OF THE OSHA VOLUNTARY PROTECTION PROGRAM (VPP) AND ITS IMPACT ON SAFETY CULTURE: A CASE STUDY OF THE ILLESHEIM ARMY HEALTH CLINIC

A DISSERTATION APPROVED FOR THE
GRADUATE COLLEGE

BY

_____
Dr. Jeffrey Maiden, Chair

_____
Dr. Joan Smith, Co-Chair

_____
Dr. Randa Shehab

_____
Dr. Kirby Gilliland

_____
Dr. Courtney Vaughn

© Copyright by CAROL A. FONTANESE 2017
All Rights Reserved.

Dedication

I dedicate this paper to my entire family, and in particular to my mother and father, the light of my life, who provided me with opportunities which opened up the world to me. My wish is that you are proud of this accomplishment, which is a small sign of my appreciation for all the sacrifice and hard work you have done to make me the person I am today. For this gift of loving and generous parents, I am forever grateful. To my husband, whom I met as I began this program, and who supported me throughout each phase of the process, I thank you from the bottom of my heart. And to my brothers and sisters for their unconditional love, encouragement and support. Please know I appreciate you beyond what words can express. At the end of the day, what really matters is not what we bought, but what we built, not what we got, but what we shared, not our competence, but our character, and not our success, but what we gave back in return.

Acknowledgements

To my original chair, Dr. Smith for her willingness to accept and mentor me as her student and her dedication to believe I could achieve a successful outcome after all these years. To Dr. Maiden for graciously stepping in to assist me in my time of need. And to Dr. Gilliland who ensured my success and made my committee whole again. My gratitude is also extended to Dr. Vaughn and Dr. Shehab who stayed with me throughout the entire journey, and to the entire committee who provided valuable and expert advice and guidance to make this dissertation pertinent and meaningful. Thank you for your expertise and validation that this study is important and will make a difference. I extend a great deal of appreciation to Thomas Zirkelbach, his staff and the leadership at the Illesheim Clinic and the U.S. Army Medical Activity, Bavaria for their steadfast cooperation and passion for leading the way. A special thanks to George LeFevre, Dave Akers, and Mark Atkins who have invested so much of themselves to change the culture of safety in the U.S. Army. And to Jenni Shoemaker, Lloyd Roberts, and Gregory Pavlovcak who gave their expertise and time to assist in making this dissertation the best it could possibly be.

Table of Contents

List of Figures ix

Abstract xi

CHAPTER

I. Introduction 1

Preface 1

U.S. Army Safety Program 2

The Joint Commission 5

The OSHA VPP 9

The OSHA and its Partnership with the U.S. Army 12

Implementation of the OSHA VPP in the Europe Regional Medical Command 14

Purpose of the Study 19

Research Questions 20

Theoretical Background of the Study 21

Summary 23

II. Literature Review 25

Heinrich Domino Theory—Accident Causation 25

Modern Accident Causation Model 27

Systems Theory 31

General Systems Theory 38
U.S. Army Systems Model 38
Occupational Safety and Health Management Systems 40
Research Studies on Occupational Safety and Health Management Systems 47
Summary 58
III. Methodology 62
Research Design/Model 62
Case Study 64
Research Questions 64
Unit of Analysis (the Case) 65
Data Collection Procedures: Interviews, Document Review, Observations 66
IV. Results 72
Introduction 72
Results of Research Question 1 73
Results of Research Question 2 77
Results of Research Question 3 80
Results of Research Question 4 87
V. Discussion and Conclusion 99
Introduction 99

Discussion of the Findings 100

Conclusion 108

Building on Existing Research 111

Recommendations for Future Research 111

References 113

APPENDICES

A. Results of Interview Questions 120

B. Results of Interview Question 1 123

C. Results of Interview Question 2 128

D. Results of Interview Question 3 131

E. Results of Interview Question 4 133

F. Results of Interview Question 5 136

G. Results of Interview Question 6 143

H. Results of Interview Question 7 145

I. Results of Research Question 8 148

J. Results of Research Question 9 151

K. Results of Interview Question 10 158

L. Results of Research Question 11 165

M. Results of Research Question 12 169

N. Interview Questions - Employees, Supervisors, Clinic Additional Duty Safety Officer and the BMEDDAC Safety Manager 183

O. Interview Questions - Commander/Senior Leadership –Illesheim Army Clinic/BMEDDAC……185

P. List of Abbreviations..... 188

List of Figures

Figure 1. Army Safety Management System. 3

Figure 2. Plan—Do—Check—Act process improvement methodology. 7

Figure 3. Four elements of the OSHA VPP Safety Management System..... 11

Figure 4. Heinrich Theory of Accident Causation (Domino Theory). 26

Figure 5. Modern Accident Causation Model. 27

Figure 6. Modern Accident Causation Model—system defects. 28

Figure 7. Modern Accident Causation Model—management error. 29

Figure 8. Modern Accident Causation Model—safety program defect, safety management error. 29

Figure 9. Modern Accident Causation Model—countermeasures. 31

Figure 10. Basic elements of the Army Systems Model. 39

Figure 11. Army Systems Model..... 40

Figure 12. American National Standards Institute for Occupational Health and Safety Management Systems. 44

Figure 13. General Systems Theory Model. 63

Figure 14. FY11 accident and injury rates before VPP implementation. 95

Figure 15. FY12 accident and injury rates before VPP implementation. 95

Figure 16. FY13 accident and injury rates before and after VPP implementation. 95

Figure 17. FY14 accident and injury rates after VPP implementation..... 96

Figure 18. Overlay of General Systems Theory with safety outcomes. 98

Abstract

The purpose of this study was to determine the effect of participating in a safety management system, the OSHA Voluntary Protection Program (VPP) and its impact on safety culture at the Illesheim Army Health Clinic. This study is critical and timely for the Department of the Army and the U.S. Army Medical Command (MEDCOM), as both organizations begin the process of implementing a safety management system throughout their area of responsibility. The Army and MEDCOM want to implement safety management systems to achieve lower accident rates and workers compensation costs, reduced absenteeism, higher morale, and enhanced public recognition.

The case study was conducted at an Army Health Clinic located in Illesheim, Germany which had a strong safety program before the implementation of the OSHA VPP. The clinic piloted VPP for the MEDCOM and achieved certification in June 2012 after seventeen months of implementation. The OSHA VPP was not well known or understood at military treatment facilities and Army health clinics in MEDCOM. Medical units have complied with the Army Safety Program and the Joint Commission standards. Many Army leaders questioned the value and return on investment of implementing another safety compliance program. The case study found the implementation of VPP not only maintained a high standard of safety, but achieved an active, visible level of management and leadership commitment, employee involvement, and a positive morale and respect for all levels of staff work and effort. Finally, there was a unique and special deep feeling of pride, communication, concern for patient and employee safety, safety awareness, and patient satisfaction within the clinic after the implementation of the VPP.

Chapter 1: Introduction

Preface

There is a lack of research on the implementation of the Occupational Safety and Health Administration (OSHA) VPP in the private or public sector. General George W. Casey Jr. and Secretary of the Army John M. McHugh supported the implementation of the OSHA VPP in the 2010 Army Safety and Occupational Health Strategic Plan, stating, "A key strategy of the Army is to increase momentum for implementing OSHA VPP. Over thirty Department of the Army sites are actively pursuing OSHA VPP recognition" (Casey & McHugh, 2010, p. 2).

There is much debate on whether occupational health and safety management systems have a positive effect on health and safety. Policymakers, regulatory agencies, and academics who are proponents for such systems have said that implementation will automatically lead to better safety and health performance, as stated in the Occupational Health and Safety Assessment Series (OHSAS) 18001 Standard. Opponents to occupational health and safety management systems argue such processes are nothing more than excessive documentation and bureaucracy. The process of certification through implementation has been criticized for excessive cost to the organization in terms of personnel resources needed to prepare, implement, and audit throughout the year. The certification becomes the central focus and reason for implementation (Zwetsloot, 2000).

The purpose of the current study was to determine the effect of implementing a safety management system, specifically the OSHA VPP, and its impact on safety culture at the Illesheim Army Health Clinic.

U.S. Army Safety Program

The U.S. Army safety program management functions are clearly outlined for Army operations at home station, in contingency operations and during wartime conditions. The Department of the Army policy, responsibilities, and procedures to safeguard Army personnel and property against accidental loss are contained in Army Regulation 385-10, referred to as the Army Safety Program.

The Army Safety Program is reflective of a programmatic approach which focuses on compliance with federal OSHA standards. It operates in isolation by itself and has a limited mechanism or process for the evaluation of continuous improvement activity. It is compliance based, prescriptive, and often managed by safety professionals that execute the enforcement of the program. This is in contrast to a systems based approach to safety where safety is flexible and accepts change, is dynamic, provides for continuous improvement activity, and shifts ownership of safety away from the safety professional, to management, leadership and employees. In a systems model, safety professionals act in the role of a technical expert and advisor and not of the enforcer.

U.S. federal agencies, including Army facilities, must comply with U.S. Public Law 91-596, The OSH Act, and the Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, Part 1960, which outlines safety and occupational health rules for the Department of the Army. The Army developed Army Regulation 385-10 to incorporate all the requirements in Public Law 91-596, the OSH Act, and Part 1960. There are a total of 25 chapters in Army Regulation 385-10, which are divided into three parts: (a) Army safety program management functions, (b) sustaining the soldier, and (c) supporting the garrison and

industrial base. Part one addresses the functions necessary for sustaining all phases and operations of the Army at home station, contingency operations, or wartime conditions. Part two addresses those functions specific to supporting the soldier during training, mobilization, tactical and field operations. Part three addresses functions supporting home station and the industrial base.

According to Army Regulation 385-10, the safety office will be structured and staffed to administer an Army Safety Management System through the chain of command based on the organization's mission, goals, and objectives as well as statutory requirements. The Army Safety Management System is comprised of five core interrelated functions which integrate the safety program elements shown below in the following figure to protect Army personnel, equipment, and facilities.

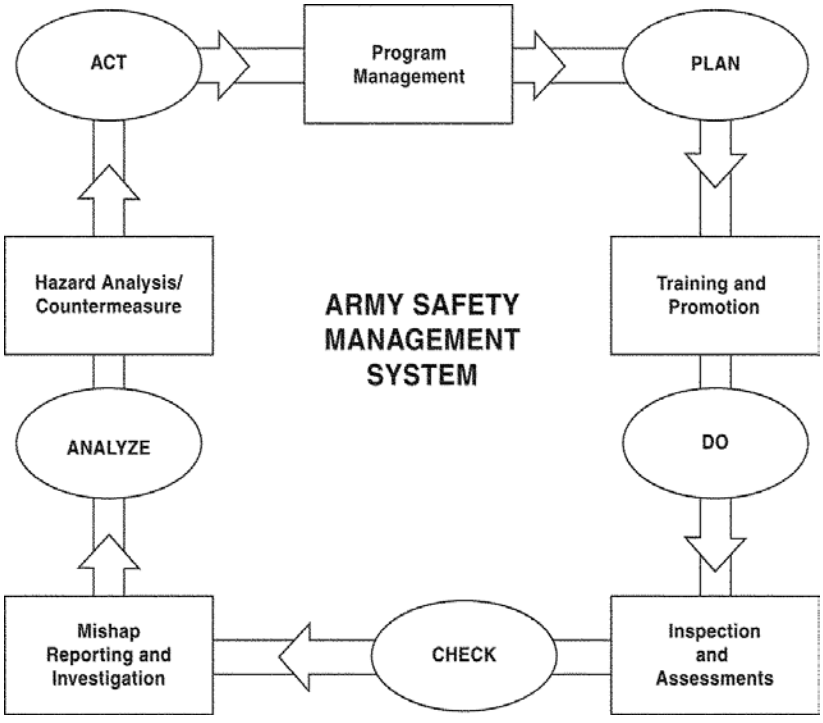


Figure 1. Army Safety Management System.

The five core functions for the Army's Safety Management System are (a) program management, (b) training and promotion, (c) inspections and assessments, (d) mishap investigation reporting and analysis, and (e) hazard analysis and countermeasures (AR 385-10, 2013). The model above shows the plan—do—check—act methodology, without a management, leadership, and employee involvement element. The OSHA VPP safety management system, however, includes this element. The Army Safety Program has historically been a compliance based program and was evaluated on the basis of compliance with the OSHA standards. When organizations were inspected, they were checked for compliance with OSHA regulations, not on how management, leadership and employees participated or became actively engaged in the safety program. Only with the utilization of the OSHA VPP at the Illesheim Army Health Clinic was the active involvement and commitment of management, leadership and employees with the safety program assessed and validated as a component of compliance.

The Army outlined a key strategy in the 2010 Department of the Army Safety and Occupational Health Strategic Plan to increase momentum for implementing the OSHA VPP at Army facilities. The second goal in the 2010 Department of the Army Safety and Occupational Health Strategic Plan was to ensure the proactive and systematic management of risk. Objective 2.4 in the plan was to develop and use a Safety and Occupational Health Management System in mission planning and execution across all military operations and activities, including acquisition, procurement, logistics and facility management. The lead office for implementing this objective was

the Office of the Deputy Assistant Secretary of the Army, Environment, Safety & Occupational Health (Department of the Army, 2013).

The Joint Commission

The Army MEDCOM's mission is to provide responsive and reliable health services and influence health to improve readiness, save lives, and advance wellness in support of the force, military families, and all those entrusted to their care (Department of the Army, 2013). The MEDCOM's effort to continually improve healthcare delivery to soldiers and family members included the requirement that "all eligible United States Army hospitals located within the 50 United States will be accredited by The Joint Commission on Accreditation of Hospitals, and all Army Medical Command hospitals must comply with The Joint Commission on Accreditation of Hospital standards on medical care evaluation" (Army Regulation 40-2, 1978, p. 5-1). Since this time, all medical facilities to include those stationed outside the continental United States have been surveyed every 3 years to ensure that safe and effective standards of medical care for soldiers have been implemented.

Today, the Joint Commission conducts triennial accreditation surveys to all Army medical treatment facilities and Army health clinics within the United States and overseas. In addition to complying with the Army safety standards contained in Army Regulation 385-10, Army healthcare organizations must comply with the Joint Commission Environment of Care standards.

The Joint Commission (TJC), formerly known as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) is an independent, not-for-profit organization that accredits and certifies more than 19,000 healthcare organizations and

programs in the United States. Organizations that seek accreditation are surveyed every 3 years. The mission of the Joint Commission is to continuously improve healthcare for the public, in collaboration with other stakeholders, by evaluating healthcare organizations and inspiring them to excel in providing safe and effective care of the highest quality and value. The vision statement is one which says that all people always experience the safest, highest quality, best-value healthcare across all settings. According to the Joint Commission, accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards.

Those healthcare organizations accredited by the Joint Commission utilize the plan—do—check—act method, originated from Walter Shewhart and Edward Deming. This method follows a prescribed four-stage cycle approach with the goal of improving a process. In the "plan" stage, the specific improvement desired is identified, the "do" stage initiates proposed tests to the change, the "check" stage examines the success of the change, and the "act" stage identifies necessary changes that need to be incorporated into the next cycle.

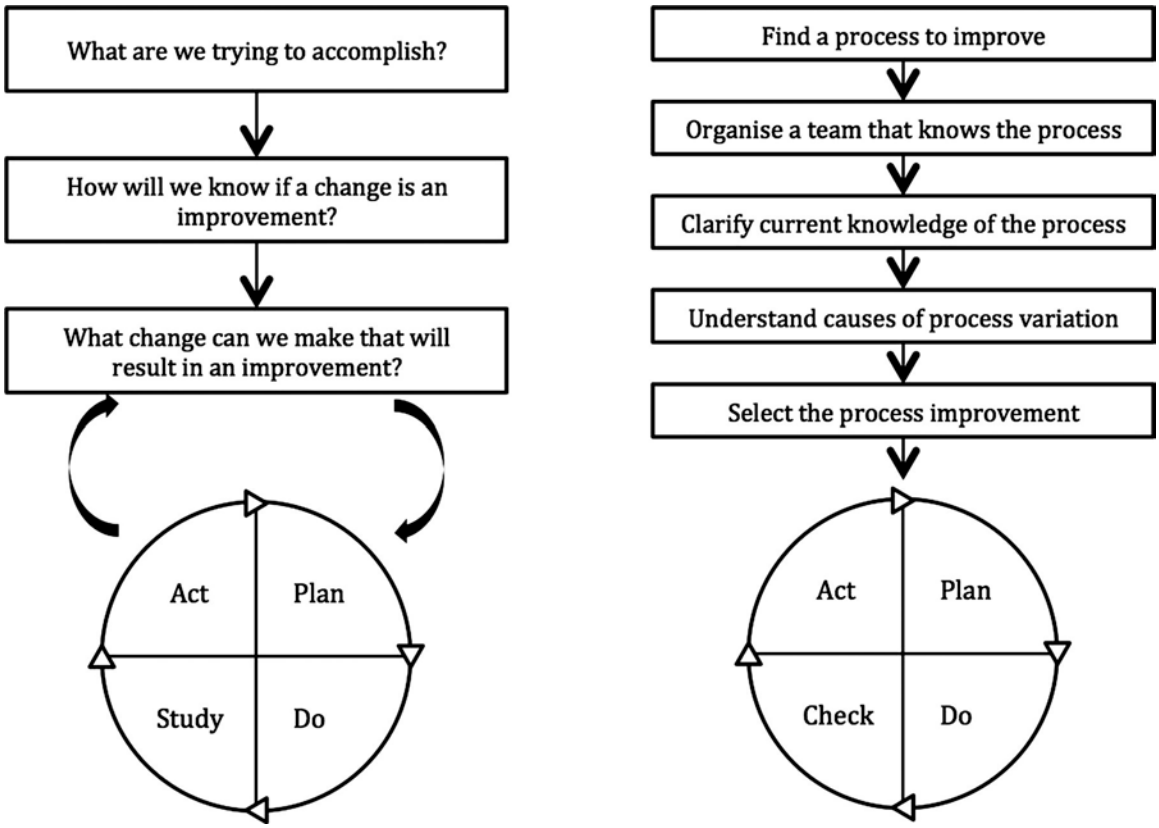


Figure 2. Plan—Do—Check—Act process improvement methodology.

All Army medical treatment facilities and Army health clinics must comply with the Joint Commission's Environment of Care standards in order to successfully pass their triennial accreditation survey. The Joint Commission has transitioned to an unannounced survey process, which means that Army medical treatment facilities and Army health clinics must be in a constant state of survey readiness. The goal of the environment of care standards is to provide a safe, functional, and effective environment for patients, staff, and visitors. This is accomplished through activities that reduce and control safety and environmental hazards and risks, prevent accidents and injuries, and maintain safe conditions for patients, staff, and visitors. The environment of care standards encompass seven different subchapters: (a) safety, (b) life safety, (c)

security, (d) emergency management, (e) medical equipment, (f) utilities, and g) hazardous materials and waste.

The environment of care standards require the appointment of a qualified and designated individual and committee responsible for managing the environment of care. In Army medical treatment facilities, this qualified and designated individual is the full-time professional safety manager. The standards also require the development, implementation, evaluation, and continuous improvement of written management programs for safety, life safety, security, emergency management, medical equipment, utilities, and hazardous materials and waste. Written management plans for each of the seven areas include the development of policies and procedures, performance standards, written criteria, and stated goals and objectives. An annual evaluation of the objectives, scope, performance, and effectiveness of each of the seven management plans is also required. The Joint Commission places a great deal of emphasis on the compliance with accurate and updated management plans and annual evaluations for all seven areas of the environment of care in order to achieve successful accreditation.

The Joint Commission requires Army medical treatment facilities and Army health clinics to use and comply with the National Fire Protection Association's Life Safety Code in maintaining and constructing healthcare facilities. Each accredited medical treatment facility and Army health clinic is required to establish a safety management program with safety policies and procedures that are compliant with applicable laws, regulations, and accepted practices. A qualified safety individual must be appointed by the chief executive officer and charged with responsibility to develop, implement, and monitor the safety management program. A safety committee, which

includes representatives of administration, clinical services, and support services must also be established to analyze identified environment of care management issues and develop recommendations for resolving them. The safety manager is required to work with appropriate staff to implement these recommendations and monitor their effectiveness.

Under the environment of care standards, the safety management plan must describe how the hospital will provide a physical environment that is free of hazards and manage staff activities to reduce the risk of human injury. In addition, the safety management plan must establish a staff orientation and education program that addresses safety issues, program performance, monitoring provisions, and provisions for periodic review.

Because of the mandatory requirement for all Army medical treatment facilities and Army health clinics to be in a constant state of survey readiness and continual compliance with the seven subchapters of The Joint Commission Environment of Care standards, there is typically a high level of safety compliance and performance at any given time throughout the year.

The OSHA VPP

For the purposes of VPP, OSHA defines a safety and health management system as a method of preventing employee fatalities, injuries, and illnesses through the ongoing planning, implementation, integration, and control of four interdependent elements: Management, Leadership and Employee Involvement; Worksite Analysis; Hazard Prevention and Control; and Safety and Health Training. (OSHA Instruction, 2008). OSHA developed VPP in 1982 to recognize and promote world class safety and

occupational health management systems in organizations where management, labor, and OSHA work cooperatively with each other. Organizations must comply with the OSH Act and all OSHA regulations as the starting point for participation in the VPP.

In the first VPP element, Management, Leadership, and Employee Involvement, leaders must be able to demonstrate their commitment by initiating lines of communication with employees and allowing for a means where employees can access and bring their concerns to top management. Leadership must also set the example to their employees by adhering to the safety rules, being knowledgeable of the safety rules and hazards of the worksite, wearing required personal protective equipment, reporting hazards, injuries and illnesses and doing those safety activities they expect their employees to do. This element also mandates participation by the employees of an organization. Employees will be evaluated on their involvement in at least three meaningful and constructive ways in the safety program. Examples of such participation include conducting: (a) safety audits or inspections, (b) accident/incident investigations, (c) self-inspections, (d) suggestion programs, (e) safety award recognition programs, (f) safety and health committees, (g) training, and (h) job hazard analysis.

The second VPP element, Worksite Analysis, organizations must be able to demonstrate the implementation of a hazard identification and analysis system which enables the organization to systematically identify safety and health hazards, risks, and methods to eliminate or control the hazards to an acceptable level of risk. Employees and leaders must be knowledgeable of these safety and health hazards that may be present within the organization.

The third VPP element, Hazard Prevention and Control, the organization must have systems in place to ensure hazards are minimized by incorporating either engineering, administrative, work practices, or personal protective equipment controls. Organizations must be compliant with all applicable hazard control programs required by OSHA such as personal protective equipment, respiratory protection or blood-borne pathogens. This element requires a documented system to ensure hazards identified through self-inspections, accidents, employee hazard reports, are assigned and abated in a timely manner.

The fourth and final VPP element, Safety and Health Training, organizations must train their employees, supervisors, and leaders so they are knowledgeable of the hazards in the workplace, how to recognize a hazardous condition, signs of workplace illnesses, and safe work procedures.

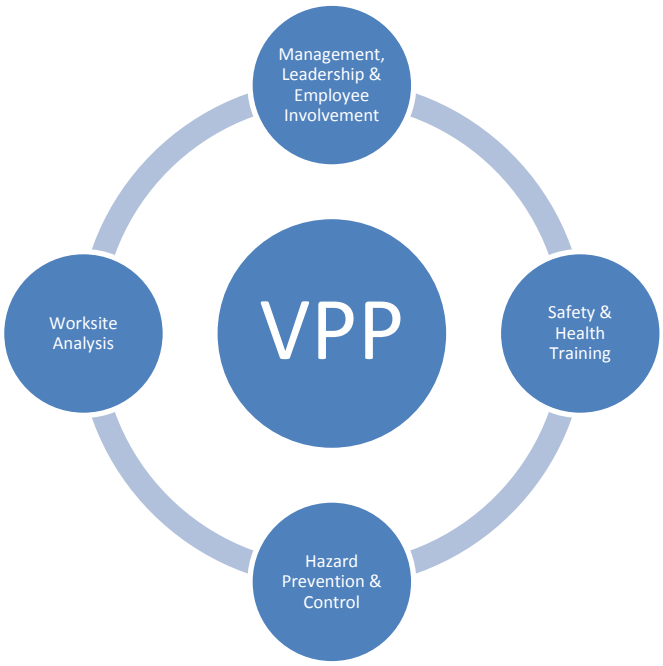


Figure 3. Four elements of the OSHA VPP Safety Management System.

The OSHA and its Partnership with the U.S. Army

OSHA created the VPP in 1982 to recognize and partner with worksites who implemented world class safety and occupational health management systems that go beyond the basic compliance with OSHA standards. Organizations meet performance based criteria in addition to compliance with OSHA standards. OSHA validates organizations qualifications through a comprehensive on-site review process that is re-evaluated every 3 years. Organizations that achieve OSHA VPP typically have injury rates 52% below their industry average.

The United States Army employs over 100,000 civilians at more than 76 installations and sites throughout the world making it one of the largest Department of Defense (DoD) employers in the United States. Recognizing the need for a proactive approach to improve the safety and health for the civilian and contract workers at these installations and sites, the Army approached OSHA with a desire to enter into an OSHA Strategic Partnership to receive guidance and assistance in improving its safety and health program. The Army realized OSHA had valuable expertise in workplace safety and health, and could offer useful tools such as participation in the OSHA VPP to help achieve the goal of improved safety and health at Army installations. The Army and OSHA initiated their first partnership agreement on October 15, 2004. They agreed to identify installations to participate in the OSHA VPP, promote the establishment and/or improvement of safety and health management systems and the integration of those systems into the overall business management system, promote the benefits of OSHA VPP, and support installations working towards VPP recognition. This agreement

supported the goals of the President's Safety, Health, and Return to Employment (SHARE) initiative. In this agreement the Army agreed to:

1. Identify installations to participate in the OSHA VPP.
2. Promote the establishment and/or improvement of safety and health management systems and the integration of those systems into the overall business management system.
3. Promote the benefits of OSHA VPP and support installations working towards VPP recognition.
4. Support Army employees in the performance of activities similar to those performed by OSHA special governmental employees, such as participation on OSHA VPP onsite evaluation teams (OSHA Strategic Partnership, 2009).

The Department of the Army and OSHA signed a second partnership agreement on August 25, 2008 which included a goal to reduce civilian and contract worker injuries and illnesses through Army facilities achieving recognition in OSHA's VPP. The Defense Oversight Council established the DoD VPP Center of Excellence (DoD VPPCX) to assist the Army and other services within the DoD to expand VPP participation (OSHA Strategic Partnership, 2009). Their mission was to assist DoD sites in achieving and maintaining VPP recognition by providing on-site and remote assistance and delivering training on OSHA VPP and safety and health technical issues. The ERMC utilized the contractual services of the DoD VPPCX to prepare for and receive baseline OSHA VPP assessments. The DoD VPPCX was utilized to conduct the final VPP assessment to determine whether the Illesheim Army Health Clinic completed all requirements for VPP certification.

According to OSHA, VPP promotes effective worksite based safety and health in an environment where management, labor and OSHA establish cooperative relationships in their efforts to implement a comprehensive safety and health management system. Approval into the OSHA VPP is OSHA's official recognition of the outstanding efforts of employers and employees who have achieved exemplary occupational safety and health programs.

Implementation of the OSHA VPP in the Europe Regional Medical Command

The author of this study worked as the ERMC safety manager, which was headquartered in Sembach, Germany. The ERMC is comprised of one Army hospital in Landstuhl, Germany and approximately 12 Army health clinics geographically spread throughout Germany, Italy, and Belgium. The Illesheim Army Health Clinic is one of the 12 Army health clinics which belong to the ERMC. To date, all ERMC Army health clinics and the Landstuhl Regional Medical Center are in various stages of implementing the OSHA VPP.

The Illesheim clinic had a very good safety program prior to beginning the journey towards VPP certification. In 2010, the researcher conducted a routine safety inspection of the clinic and observed a high level of management and leadership commitment and employee involvement in caring for each other and for their patients. During this routine inspection, it was visible to the researcher the employees knew everyone was responsible for safety and for correcting hazards and deficiencies in the workplace. They were highly motivated and proud to show the inspector their safety program and the initiatives they put in place to achieve a mishap free working environment. At this time, the clinic stood out among the rest of the other clinics within

the region in terms of their safety achievements and the level of ownership employees and leaders displayed in making the safety program their own. The clinic commander was not knowledgeable about the OSHA VPP at the time, but was excited and committed to volunteering to be the first try it within the region. Army personnel rotate jobs every 2 to 3 years, so the employees present in the clinic at this time may not be the same employees who remained to implement the VPP. Army civilian employees also rotate jobs on a frequent basis. The clinic commander who volunteered to start the VPP departed shortly afterward and a new commander arrived who led the clinic through the VPP process to certification. The current researcher selected the Illesheim clinic for this study because: (a) the clinic volunteered, (b) the researcher wanted to find out whether an organization who embraced a culture of employee and leader participation and commitment to safety could maintain or improve their level of safety performance after the implementing the OSHA VPP, and (c) the researcher wanted to know whether the employees would see the addition of another layer of safety compliance program as a burden requiring additional resources. In addition, this clinic was selected to be a pilot study for the MEDCOM. The successful implementation of the OSHA VPP at this clinic would lead to implementation of this program throughout the entire command.

In 2011, the ERMC commander, a one-star general, gave written support and included the goal to implement the OSHA VPP in ERMC's 5-year Strategic Safety Plan. Units were asked to volunteer to participate and implement OSHA VPP throughout their footprints. The ERMC's Safety and Occupational Health Strategic Safety Plan, dated May 17, 2011, included four goals related to the implementation of

the OSHA VPP. The first goal in the strategic plan stated ERMC will implement the OSHA VPP. The four objectives in the first goal were:

1. Ensure units participate in an employee safety perception survey in order to establish a safety and health culture baseline;
2. Ensure accountability for leader, individual, and organization responsibilities in safety and occupational health through a documented performance standards and appraisal system;
3. Ensure employees are actively involved in at least three meaningful ways in activities and decision making that impacts safety and health; and
4. Ensure the integration and synchronization of OSHA VPP principles into subordinate units' strategic safety plans, policy, procedures, training, operations, and doctrine.

The Illesheim Army Health Clinic was the first unit to volunteer to implement the OSHA VPP in January 2011. The MEDCOM embraced the Army initiative and encouraged the voluntary implementation of the OSHA VPP in an effort to reduce accidents, injuries, and fatalities associated with workers compensation costs. ERMC was one of three regions who volunteered to implement the OSHA VPP at this time.

Since 2010, the MEDCOM has promoted the voluntary implementation of the OSHA VPP in an effort to reduce accidents, injuries, fatalities, and workers' compensation costs. On June 1, 2012, MEDCOM published a concept of operations and implementation plan for the initiation of the medical department safety management system, called the Army VPP Star Strong. The plan mandated all hospitals and clinics in the command implement the Army VPP Star Strong, which mirrored all elements

contained in the OSHA VPP safety management system. It utilized the OSHA criteria and conducted staged assessments as a safety and occupational health management system in three levels of maturity. The goals of MEDCOM in initiating the Army VPP Star Strong were to decrease workplace injuries and illnesses, lost workdays, federal worker compensation costs, and to transform the compliance based Army occupational safety and health program to a performance-based safety and occupational health management system. The DoD VPPCX conducted the final audit and the application for approval was submitted to the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health). The Deputy Assistant Secretary of the Army office had oversight of the Army VPP Star Strong. Recognition of achieving Army VPP Star Strong came from the Department of the Army and not OSHA. The comprehensive safety and health management system elements of the Army VPP Star Strong were identical to the elements contained in the OSHA VPP. The four elements were: (a) management leadership and employee involvement, (b) worksite analysis, (c) hazard prevention and control, and (d) safety and health training.

Beginning June 1, 2012, medical treatment facilities and Army health clinics throughout the MEDCOM were required to comply with three different types of safety programs and systems: the Army safety standards in Army Regulation 385-10, The Joint Commission Environment of Care standards, and the OSHA VPP. To many within the MEDCOM, this appeared to be an unnecessary mandate to comply with three separate safety compliance programs and systems at a time when personnel and fiscal resources were strained.

Army medical treatment facilities and Army health clinics must comply with U.S. Public Law 91-596, the OSHA Act, the Basic Program Elements for Federal

Employee Occupational Safety and Health Programs and Related Matters, Part 1960 and Army Regulation 385-10, the Army Safety Program. Army Regulation 385-10 outlines the mandatory safety and occupational health rules applicable to Department of the Army employees and incorporates the mandates of U.S. Public Law 91-596, the OSHA Act, and Part 1960. The most current update to Army Regulation 385-10 mandates each safety office be structured and staffed to administer an Army safety management system through the chain of command based upon the organization's mission, goals, and objectives, as well as statutory requirements. All policy and procedures contained in Army Regulation 385-10 are written in accordance with the OSHA standards.

Army medical treatment facilities and Army health clinics must comply with the Joint Commission's Environment of Care standards in order to successfully pass their triennial accreditation survey. Because of the new unannounced survey process, Army medical treatment facilities and Army health clinics must be in a constant state of survey readiness. These facilities must comply with the Joint Commission's Environment of Care standards which are meant to provide a safe, functional and effective environment for patients, staff and visitors. They must accomplish this through activities that reduce and control safety and environmental hazards and risks, prevent accidents and injuries and maintain safe conditions for patients, staff and visitors. The environment of care standards encompass seven different subchapters: (a) safety, (b) life safety, (c) security, (d) emergency management, (e) medical equipment, (f) utilities, and (g) hazardous materials.

Leaders and safety professionals within the region saw the implementation of the OSHA VPP as more work in an era of dwindling resources and competing priorities mandated by MEDCOM. Some of the leaders and safety managers were reluctant to begin a new program and did not see the value that could be obtained when Army medical treatment facilities and Army health clinics were already surveyed by the Joint Commission every 3 years, internally by regional headquarters on an annual basis, and by subordinate level headquarters on a semi-annual basis.

Purpose of the Study

The purpose of the study was to determine the effect of implementing a safety management system, specifically the OSHA VPP, and its impact on safety culture at the Illesheim Army Health Clinic. This study was critical and timely for the Department of the Army and the MEDCOM as both organizations were beginning the process of implementing safety management systems. The Army and the MEDCOM's aim was to implement safety management systems with the goal of achieving lower accident and injury rates, lower workers compensation costs, reduced absenteeism, higher morale, and enhanced public recognition.

The MEDCOM was supportive of the OSHA VPP and encouraged military treatment facilities and Army health clinics to volunteer to participate prior to the implementation of the concept of operations plan in 2012. Despite this effort, the OSHA VPP was not well known or understood at military treatment facilities and Army health clinics within the Army MEDCOM. Historically, these units complied with the Army safety program standards and the Joint Commission Environment of Care standards. Today, many Army leaders questioned the value and return on investment of

implementing another safety compliance program and system. This study will be relevant to further implementation efforts of safety management systems within the Department of the Army and the Army MEDCOM.

The researcher conducted this study at the Illesheim Army Health Clinic located in Illesheim, Germany. This clinic is subordinate to the U.S. Army, Bavaria Medical Department Activity (BMEDDAC). The BMEDDAC, located in Vilseck, Germany, is subordinate to the ERMC, in Sembach, Germany. The ERMC is one of five regional medical commands which report to the MEDCOM in San Antonio, Texas. The Illesheim Army Health Clinic volunteered to implement the OSHA VPP in January 2011. Prior to beginning the OSHA VPP process, the clinic participated in the triennial Joint Commission accreditation surveys and semi-annual safety staff inspections from the BMEDDAC headquarters. The Joint Commission survey process inspects for compliance with the Joint Commission Environment of Care standards, which are focused more on patient safety rather than employee safety. The BMEDDAC safety office staff conducts inspections of the Illesheim Army Health Clinic for compliance with both the Joint Commission Environment of Care standards and the Army Safety Program standards. The Illesheim Army Health Clinic was the first facility within the ERMC to volunteer to participate in the OSHA VPP.

Research Questions

The general research question for this study aimed to determine the effect of implementing a safety management system, specifically the OSHA VPP, and its impact on safety culture at the Illesheim Army Health Clinic. The general research question was divided into the following subset of four questions:

1. How does implementing the OSHA VPP safety management system affect employee and patient satisfaction?
2. How do employees feel about adding the OSHA VPP safety management system to their workload in addition to the hospital accreditation and the Army Safety Program?
3. What effect does the OSHA VPP have on staff morale?
4. How does implementing the OSHA VPP affect leadership commitment and employee involvement?

Theoretical Background of the Study

The researcher used the general systems theory approach for this paper and its application in the area of human activity systems as the theoretical basis for determining the effect of implementing the OSHA VPP and its impact on safety culture at the Illesheim Army Health Clinic. Using this as the theoretical foundation was helpful as the boundaries that separate the aspects of the system from the environment are difficult to define in human and conceptual social systems. The general systems theory allows for a more tangible definition of a system. Many times, human and conceptual social systems do not have clear-cut and agreed-upon aims or purposes. Human activity systems may have multiple or overlapping purposes where three levels may be present: (a) the purpose of the system, (b) the purpose of its parts, and (c) the purpose of the system of which it is a part, the supra-system.

One way to express the meaning of a system in a broad context is to describe it as a complex of interacting components and the relationships between them that allow for the identification of a well bounded or maintained entity or process. Because social

and psychological phenomena do not have easily definable boundaries, nor do they fit structured quantitative modeling, an alternative approach must be utilized.

The systems theory methodology utilizes the multiple interactions of components, models and extracts from it certain details of structure and component, and places emphasis on that which defines the characteristic functions, properties, and relationships that are internal or external to the system (Laszlo & Krippner, 1998). The systems approach views the world through the lens of integrated systems and focuses the spotlight on the whole and the complex interrelationships between its related parts. This makes the systems approach one that is all inclusive, embracing, and comprehensive. The general systems theory supports the development of a global approach, one that favors team work, collaboration, learning for life, and the utilization of the entire universal accumulation of knowledge and wisdom. The reason that the researcher selected the general systems theory approach is because the OSHA VPP safety management system itself looks at and depends on the interrelationship, integration and collaboration between the four separate parts of the process, leadership and employee involvement, hazard control and prevention, worksite analysis, and safety and occupational health training to effect a global vision to reduce accidents and injuries and increase employee morale within an organization.

Occupational health and safety management systems can be traced back to the Second World War with Heinrich's (1931) book, *Industrial Accident Prevention: A Scientific Approach*. This was the first scientific approach of an accident causation theory. In Heinrich's domino theory, he stated that the primary cause of accidents in the workplace was the result of an employee's unsafe behavior rather than the work or the

hazard. Heinrich's theory led to the development of the modern accident causation theory which added the concept of systems defects, management errors, safety program defects, and safety management errors into the process. Today, the Army's Systems Model incorporates tasks, people, training, environment, and material as a part of the accident causation process.

Summary

The purpose of this study was to determine the effect of implementing a safety management system and its impact on safety culture at the Illesheim Army Health Clinic. The Army Safety Program is reflective of a programmatic approach which focuses on compliance with federal OSHA standards. It has a limited mechanism or process for the evaluation of continuous improvement activity. It is compliance based, prescriptive, and often managed by safety professionals that execute the enforcement of the program. This is in contrast to a systems-based approach to safety, where safety is flexible and accepts change, is dynamic, provides for continuous improvement activity, and shifts ownership of safety away from the safety professionals to management, leadership, and employees.

The MEDCOM was supportive of the OSHA VPP and encouraged subordinate military treatment facilities to volunteer to participate prior to the implementation of the concept of operations plan in 2012. Despite this effort, the OSHA VPP was not well known or understood at the military treatment facilities and Army health clinics within the MEDCOM. Most Army medical treatment facilities and Army health clinics were reluctant to begin the process of voluntarily implementing the OSHA VPP. For the last several decades, Army medical treatment facilities have complied with the Army Safety

Program standards and the Joint Commission Environment of Care standards. In an era of reduced personnel and financial resources, many Army leaders have questioned the value and payback of implementing an additional set of safety compliance standards. This study will be relevant to the further implementation efforts of the OSHA VPP within the Department of the Army and in particular, the MEDCOM.

Chapter 2: Literature Review

Heinrich Domino Theory—Accident Causation

In order to understand how occupational health and safety management systems have evolved, it is important to look at earlier theories of accident causation. The earliest scholar, H.W. Heinrich (1931), a safety engineer and pioneer in the field of industrial accident safety, established the domino theory. This theory states that injuries result from accidents, accidents result from unsafe acts, and unsafe acts are the fault of people who were influenced by their social and family environment, or by inherited characteristics or traits acquired by ancestry. According to Heinrich, an accident is one component in a sequence that may lead to an injury. These components can be visualized as a series of dominoes standing on edge. When one falls, a chain reaction is initiated that engages the other to fall. Each domino is dependent on the one before it to determine whether it stands or falls. This theory set the standard and approach for accident causation in industry at the time. Heinrich's process began with the injury, which he traced back to its causes. Heinrich believed that the injury was caused by the accident, and the accident was caused either by the individual performing an unsafe act, or an unsafe condition in the environment. This was considered a very different approach to how accidents were viewed in the past, where the injured individual was blamed for getting hurt. The figure below depicts the Heinrich theory of accident causation, or the domino theory.

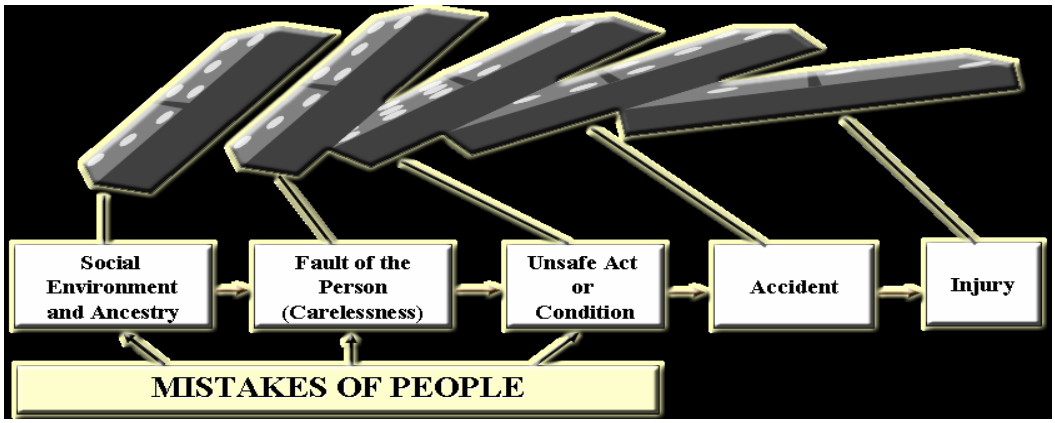


Figure 4. Heinrich Theory of Accident Causation (Domino Theory).

The development of the Heinrich Theory of Accident Causation was a major breakthrough for safety professionals and industry at the time. Even though the model allows for the possibility of giving blame to the individual, it opens up more room for analysis of the cause for accidents. The environment was looked at in more detail to include the layout and operation of machines in the workplace in an effort to engineer for safety. Although this model was a giant leap forward by recognizing the importance of unsafe acts and unsafe conditions, it still pointed to those acts performed by individuals, making them the center of blame for the accident and injury. The social environment and ancestry portion of the model is not something that employers can affect or change with their employees to any great extent. The important parts of this model where people can prevent future accidents from occurring are the areas of unsafe acts and unsafe conditions.

In Heinrich's (1931) Domino Theory, most of the attention is focused on the factor preceding the accident, the unsafe act or condition. Heinrich stressed that safety professionals should be interested in all five parts of the process, but they should be primarily concerned with accidents and the causes of those accidents. Heinrich's

primary emphasis was on accidents, not injuries or property damage; although not every slip, trip, or fall will result in an injury, an accident has taken place.

Heinrich's Domino Theory contained a three-pronged corrective action sequence, known as the three "E"s. The three pillars of corrective action included (a) engineering, controlling the hazards through product design or process change; (b) education, training employees in all facets of safety and enforcement; and (c) ensuring that all internal and external rules and regulations and were followed.

Modern Accident Causation Model

This model utilized the Heinrich model as a basis and improved it to better understand the root causes and corrective actions. What Heinrich identified as the injury, is now replaced with the word result. This change reflected that the result can be either an injury or can involve property damage. It also showed the result can range from something very minor to something very severe. The word accident was changed to mishap. Finally, the words unsafe act and unsafe condition, used by Heinrich, were changed to operating error, to enable the understanding that both conditions are resulting from the mistakes made by individuals. The figure below shows the basic version of the Modern Accident Causation Model.



Figure 5. Modern Accident Causation Model.

The Modern Accident Causation Model, up to this point, was similar to Heinrich's model. The model was further developed and from this stage made a radical departure from the Heinrich Model of Accident Causation. The new idea embedded into the model was the consideration of a system's defect, which significantly changed what was looked at and how it was being done. The figure below shows the Modern Accident Causation Model with the addition of the systems defects.

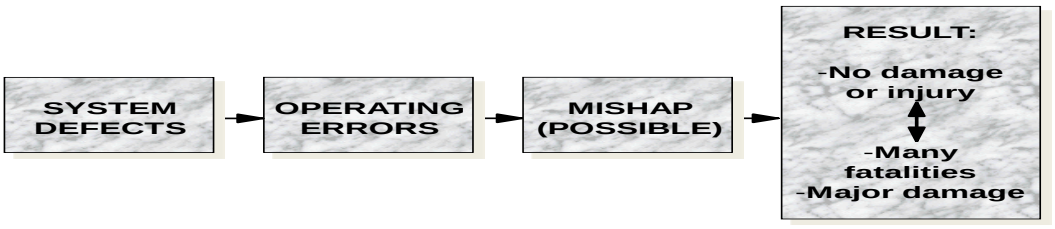


Figure 6. Modern Accident Causation Model—system defects.

With the addition of system defects into the model, the operating errors reflected not only the cause of people's faults, but showed they can occur because of system defects. System defects were weaknesses in the way the system was designed or operated.

The model went one step further and introduced the concept of management errors to the model. In attempting to answer the question of what causes systems defects, one explanation is that managers are the ones who design systems, thereby initiating a system's defect in the process. The figure below shows the Modern Accident Causation Model with the addition of the management errors.

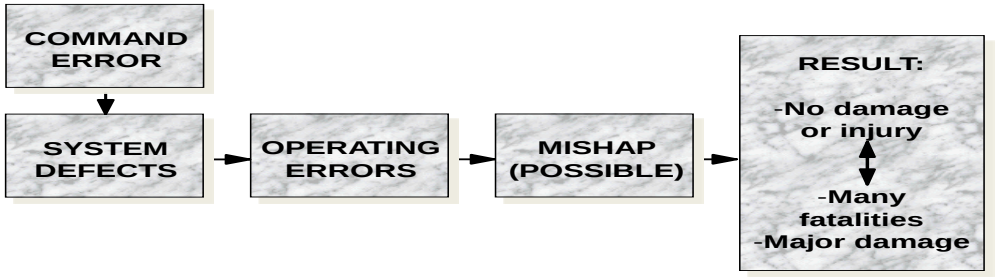


Figure 7. Modern Accident Causation Model—management error.

The model goes further and incorporates the role of the safety manager into the accident causation model. It defines a safety program defect as an aspect of the safety program that allowed for a preventable management error to exist. Examples of a safety program defect include (a) ineffective information collection, (b) weak causation analysis, (c) poor countermeasures, (d) inadequate control, and (e) inadequate implementation procedures. It defines a safety management error as a weakness in the knowledge or motivation of the safety manager which allowed for a preventable defect to exist within the safety program. The figure below shows the Modern Accident Causation Model with the addition of the safety program defect and safety management error.

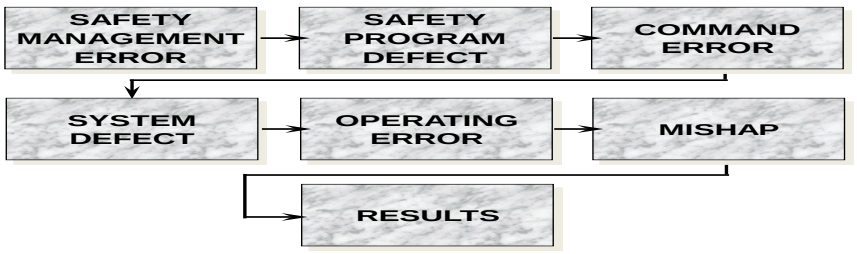


Figure 8. Modern Accident Causation Model—safety program defect, safety management error.

The Modern Accident Causation Model further delineated the seven major parts of the model listed above and provided specific countermeasures that can be initiated for each part of the model. There are differences between the Modern Accident Causation Model and Heinrich's theory. The Modern Accident Causation Model delineated that the end result had variability, meaning the result can range from no injury or damage to major damage and fatalities, whereas the Heinrich theory does not have variability. The Modern Accident Causation Model introduces the systems concept to pinpoint the origin of operating errors, whereas the Heinrich model totally overlooks this concept. This updated model incorporated the role of the safety manager and their relationship to management, and added countermeasures for every step in the model. The figure below shows the Modern Accident Causation Model with appropriate countermeasures for each of the seven parts of the model.

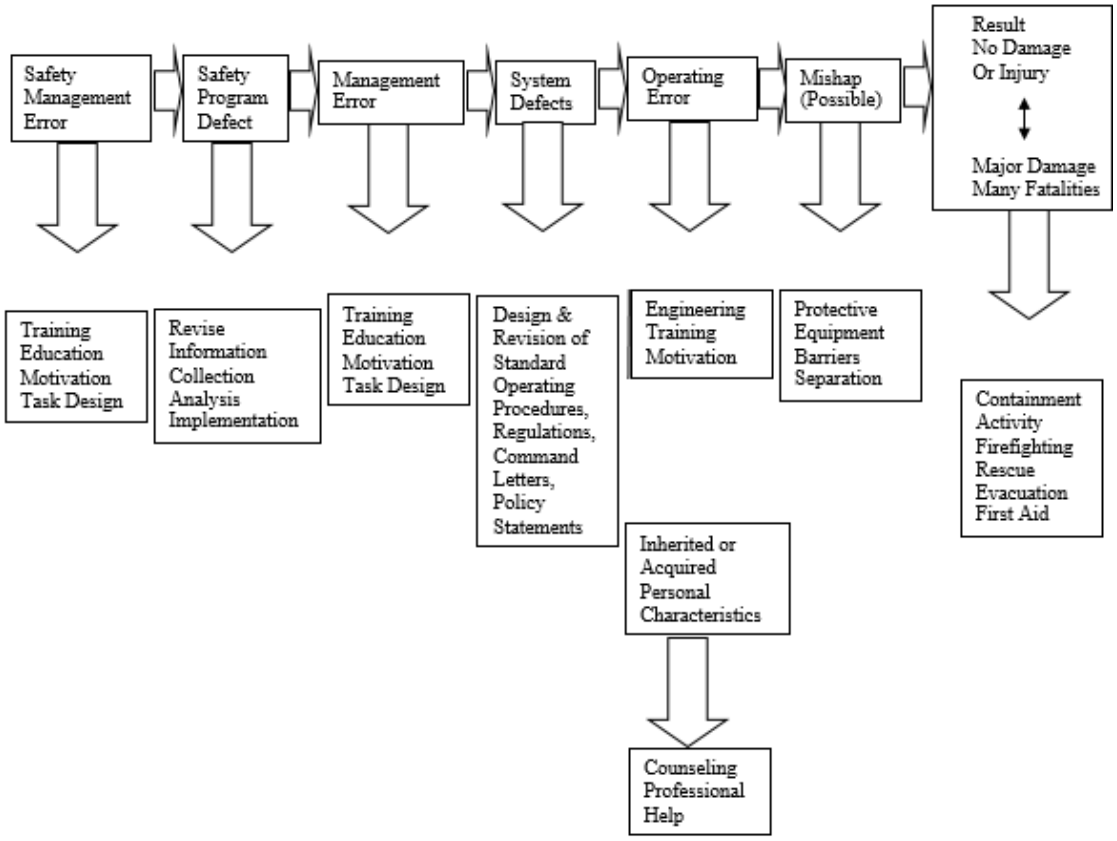


Figure 9. Modern Accident Causation Model—countermeasures.

Systems Theory

The beginning of systems theory can be traced back to the time of Aristotle, with the concept that knowledge comes from an understanding of the whole and not of any one single part of the whole. This concept was further refined during the last century and became known as systems theory (Bogdanov, 1922, 1980; Lazlo, 1996; Meadows, 2008; von Bertalanffy, 1968). Systems theory is interdisciplinary and explores systems in nature, society, and science in a holistic approach. It pivots attention away from the part to the whole (Checkland, 1997; Jackson, 2003; Weinberg, 2001). What stands out as important are the relationships between the parts of the system and the events produced because of their interaction. The result is system

elements that are rationally connected towards a shared purpose (Mele, Pels, & Polese, 2010). Systems theory challenges the idea that a phenomenon is not completely understood by dissecting it into small parts and putting it back together again. Rather, a global higher-level vision or goal must be utilized to realize the system's true functionality (von Bertalanffy, 1968).

A system can be defined as something whole in which one can draw a perceived boundary around it, identify internal and external elements, and inputs and outputs emerging from the whole. A systems theory is a theoretical perspective that analyzes the whole of a phenomenon and not just the sum of its parts. The goal is to understand the interactions and the relationships between all parts of the system in order to assess the system's functioning and outcomes.

Another definition of a system suggests it is a set of two or more interrelated elements with the following properties:

1. Each element has an effect on the functioning of the whole;
2. Each element is affected by at least one other element in the system;
3. All possible subgroups of elements also have the first two properties (Ackoff, 1981).

Macy (1991) described a system as less a thing than a pattern. The framework in which one perceives, interprets, and is aware of one's surroundings is rapidly changing as the nature of human relations evolves. Ways in which one attempts to interpret the meaning and significance of change range from: (a) the predictive or empirical, (b) the cultural or interpretative, and (c) the critical or post-structural epistemological viewpoints. As one tries to place value and assess the achievement of goals, multiple

interpretive frameworks and approaches have been used and simultaneously challenged worldwide.

A strong defense of systems theory is its ability to enable an interdisciplinary approach and framework to facilitate the understanding of the relationship between our perceptions and the environment it represents. The systems approach is used frequently in studying cognitive development and human perception. Systems theory helps break down and enable the understanding of the complex dynamics of human psychological, sociological and cultural change. Systems theory provides a holistic approach to break down the multitude of complexity of observed phenomena in the human environment.

Systems theorists in the first half of the 20th century included Alfred North Whitehead, Ludwig von Bertalanffy, Anatol Rapoport, Kenneth Boulding, Paul A. Weiss, Ralph Gerard, Kurt Lewin, Roy R. Grinker, William Gray, Nicolas Rizzo, Karl Menninger, and Silvano Arieti. Von Bertalanffy, Whitehead, and Weiss were aware of the need to develop a general science of organized complexity. As a result, Ludwig von Bertalanffy (1968) developed the *Allgemeine Systemlehre* (general theory of systems, or general system theory.)

The advantage of utilizing systems theory for this case study was its usefulness in providing an interdisciplinary framework for the exploration and study of the relationship between perception and the world it represents. The central focus of systems theory is on how to reduce or control uncertainty in the best possible way. Studies of human perception rely more and more on the systems approach. Systems theory helps break down the complex dynamics of the interactions between biology, psychology, sociology, and cultural change and make them more understandable by

utilizing a holistic approach. Systems theory is applicable to both epistemological, ontological, and gnosiological situations and is concentrated on exploring phenomena and events using a holistic and integrative approach. The systems approach can be either ontological, epistemological, or contain aspects of both; it provides a basis for the inclusive study of the complex human experience.

A system must be capable of withstanding periods of disorganization, as predicted by the second law of thermodynamics which states “entropy always increases in any closed system not in equilibrium, and remains constant for a system which is in equilibrium” (Bullock & Stallybrass, 1977, p. 634). Systems dissipate energy unless they are purposively maintained by an outside agency, so there must be organizing forces present which permit the conservation of its structure and function. Internal relations in an entity not possessing such characteristics tend to degrade until a state of thermodynamic equilibrium is reached (Laszlo & Krippner, 1998).

There are two distinctions of systems theory. The first is between the development of systems ideas and the second is the application of systems ideas within an existing discipline, resulting in two broad areas of systems inquiry (Laszlo & Krippner, 1998). The general evolution theory is an example of the development of systems ideas, whereas the social systems design methodology is an example of systems existing within an existing discipline. They can be further explained as hard system approaches (science), soft system approaches (humanistic psychology), and mixed approaches such as those used in operations research. Hard systems lean towards scientific, real-world scenarios, and have clearly defined goals and purposes. At the

opposite continuum are the soft systems, which showcase human beings as the key components to the system making goals difficult to define and their purpose vague.

Soft systems thinking has led to the initiation of what is known as emancipatory systems thinking. Emancipatory systems thinking is related to an epistemological approach called critical systems thinking, used often in humanistic oriented systems. Researchers including Ulrich (1983), Flood (1990), and Flood and Jackson (1991) assimilated different systems approaches to problem solving. This theory encompasses the following five areas: (a) critical awareness, (b) social awareness, (c) complementarism at the methodology level, (d) complementarism at the theory level, and (e) human emancipation (Laszlo & Krippner, 1998).

In utilizing the critical systems approach, critical awareness can assist in analyzing the assumptions, strengths, and weaknesses of the system under study and at the level of the system as a whole. Social awareness highlights the organizational climate that either accepts or rejects the current systems approach used. Complementarism of methodologies and theory advocates the use of additional sub methodologies and theories. Human emancipation focuses on making circumstances and environments better for those involved in the system.

When utilizing the systems theory approach, it is critical to pay attention to the observer and observed relationship which demonstrates the importance of one's viewpoint in analyzing organizational behavior. The behavioral aspects are integral components of individual performance in an organization and point to the importance of social relationship and dynamics, individual lifestyles, individual motivations, and individual conditions (Gatti, Biferali, & Volpe, 2009) within an organization. The idea

of a system is not always synonymous with objectivity, but is more so dependent on specific points of view, at different points in time and can vary from one person to the next.

The systems approach focuses its attention on the whole and the complex interrelationships between its parts, instead of studying the parts themselves. One advantage of this approach is that it gives one the ability to see and understand the way the characteristics of these relationships influence the behavior of the system. Blom (1997) identified the Classic Systems Theory (General Systems Theory) and Open Systems Theory, which enable one to see how the characteristics of the relationships which occur inside of the system and allow the system to reduce or control environmental uncertainty—that which is external or outside—in the best possible way.

In a meta-theoretical analysis of Safety Management Systems theories in a military environment, Moorkamp, Kramer, van Gulijk, and Ale (2014) studied the theoretical premises of Safety Management Systems Theory and resilience-Engineering Theory in managing safety in the Dutch military expeditionary force. The results indicated the Safety Management Systems Theory and the Resilience Engineering Theory are not suitable for managing the safety of the Dutch military expeditionary force. The results indicated that applying the safety management system theory could lead to a system that lagged behind and was unable to deal with the complex and changing environment found in the military expeditionary force. Moorkamp et al. suggested that Safety Management Systems Theory might be better utilized in organizations with a stable structure and minimal changes in their environment. The researchers inferred that Resilience-Engineering may offer safety management

strategies that do not improve the ability of the Dutch military expeditionary force to safely reduce environmental uncertainty. Their reflections indicated that Safety Management Systems Theory and Resilience Engineering Theory are not universally applicable to all organizational settings. From their meta-analysis of theories, these researchers suggested there may be other theories or perspectives to use to study safety in an organization other than the General Systems Theory.

The General Systems Theory supports the development of a global approach, one that favors team work, collaboration, learning for life, and the utilization of the entire universal accumulation of knowledge and wisdom. The systems approach utilizes qualitative aspects of methodology which involves the intuitive element in applying systems concepts. The systems approach can utilize not only algorithms, but non-algorithmic procedures such as heuristics that can lead to satisfactory results. In some cases, systems theory is utilized as a qualitative heuristic function. As Tehranian (1974) stated, “The systems thinker’s perception always incorporates an element of human intuition” (p. 68). An observer who is conducting systems research will give an account:

> …of the world, or part of it, in systems terms; his purpose in so doing; his definition of his system or systems; the principle which makes them coherent entities; the means and mechanisms by which they tend to maintain their integrity; their boundaries, inputs, outputs, and components; their structure. (Checkland, 1981, p. 102)

General Systems Theory

Ludwig von Bertalanffy is credited as the founder and author of the General Systems Theory first commenting on the subject as early as 1925-1926. He first gave a presentation of the General System Theory in a philosophy seminar at the University of Chicago in 1937 and his first publication on this subject was released after World War II. By the 1960s, there was an effort to integrate science and theory formulation in an interdisciplinary approach which spread to the humanities.

Von Bertalanffy's (1968) theory describes how systems interact with components in the environment, a system of wholeness. A fundamental notion of the General Systems Theory is its focus on interactions. His core theory emphasizes the interrelationships between elements, which form the whole when taken together. As a biologist, von Bertalanffy applied his theory to biology, cybernetics, as well as to the social sciences. He recognized the challenges his theory posed when attempting to connect the natural sciences and human social systems. He is known for his contribution to Open Systems Theory and by the ability to apply it to other disciplines; it is considered a general theory of systems.

Von Bertalanffy (1968) stated, "It is necessary to study not only parts and processes in isolation, but also to solve the decisive problems found in organization and order unifying them, resulting from dynamic interaction of parts, and making the behavior of the parts different when studied in isolation or within the whole."

U.S. Army Systems Model

The Army developed an Army Systems Model acknowledging that the design of the system is critical to the efficiency of accomplishing the mission. The basic elements

of the Army Systems Model included task, person, training, environment, and material (Figure 10).

SYSTEM				
TASK	MAN	TRAINING	ENVIRONMENT	MATERIAL
Communication Control Arrangement Demands on Men Time Aspects	Selection Mentally Physically Emotionally Qualified Motivation Positive Negative Retention	Types Initial Update Remedial Targets Operating Supervisory Management Consideration Quality Quantity	Lighting Noise Ventilation Others Facilities Grounds Weather	Machine Design Supplies Equipment Maintenance

Figure 10. Basic elements of the Army Systems Model.

A system is a group of interrelated parts that accomplish what they were designed to do when working together as they should. The Army Systems Model views the Army installation or organization as a system, one that has specific goals and missions. As the figure above shows, each organization has its own unique set of inputs or resources (personnel, material) required to accomplish the mission. The military organization also has output, or the accomplishment of the mission and goals.

When an organization is viewed as a system, it can be easier to see when something goes wrong in the design of the system, especially when one is aware of the components that make up the system. When the system is explicitly broken down into specific elements, as described above, a person is able to study and analyze each of the sub-elements and determine what went wrong, what was designed poorly, or what defects were erroneously built into the job. Other sections of the systems model may

develop defects such as the man/person, training, environment, and material. Below is a representation of the Army Systems Model.

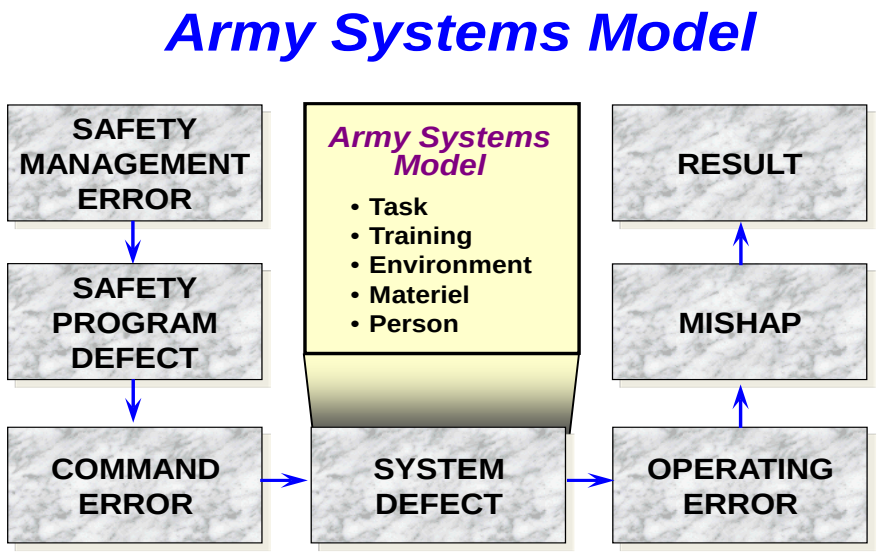


Figure 11. Army Systems Model.

Occupational Safety and Health Management Systems

The rise of systems thinking in the 1980s led to the development of management systems in large firms and the implementation of occupational health and safety management systems during the 1990s. Since then, occupational health and safety management systems have progressed in their development and matured over time. These systems are implemented in the private and public sector now more than ever before; however, little empirical evidence has been found on their effectiveness and impact on the safety and health performance of an organization.

The concept of occupational health and safety management systems is complex and the literature contains many different definitions. The current debate in the field indicated that there is no standard structure for these management systems. As a result,

different approaches and models exist with some promoting a few series of required elements while others contain more. The goal of these systems is to improve the health and safety of workers, but each occupational health and safety management system has a different primary focus. Some emphasize prevention, the employer's responsibility, or even the employee's participation and involvement in the organizations health and safety program.

Some of the most common occupational safety and health management systems are the American National Standard Institute - American Industrial Hygiene Association, (ANSI-AIHA Z10), the OSHA Occupational Health and Safety Assessment Series Standard, (OSHAS 18001), the OSHA Voluntary Protection Program (VPP), the British Standard (BS 8800:2004), and the Australian/New Zealand Standard (AS/NZS-4801:1997). Since they all have different areas of emphasis, it is best to specify what occupational health and safety management system is being described at the time.

Robson et al. (2005) defined an occupational health and safety management system as an integrated set of organizational elements involved in the continuous cycle of planning, implementation, evaluation and continual improvement, directed toward the abatement of occupational hazards in the workplace. Such elements include, but are not limited to, organization's occupational health and safety relevant policies, goals and objectives, decision-making structures and practices, technical resources, accountability structures and practices, communication practices, hazard identification practices, training practices, hazard controls, quality assurance practices, evaluation practices, and organizational learning practices.

The AS/NZS-4801:1997 defines an occupational health and safety management system as that part of the overall management system which includes: (a) organizational structure, (b) planning activities, (c) responsibilities, (d) practices, (e) procedures, (f) processes, and (g) resources for developing, implementing achieving, reviewing, and maintaining the health and safety policy, and managing the health and safety risks associated with the business of the organization.

The National Safety Council (2010) defined an occupational health and safety management system as a systematic, explicit, and comprehensive process for managing safety risks that provides for goal setting, planning and measurement of performance against defined criteria. It is also a formal method of measuring and evaluating individual and organizational safety performance with an emphasis on continuous improvement. The International Labor Organization's (ILO, 2001) definition is a set of interrelated or interacting elements to establish occupational safety and health policy and objectives and to achieve those objectives.

Nielsen (2000) stated that occupational health and safety management systems are not a well-defined set of management systems. There are not clear boundaries between occupational health and safety activities, occupational health and safety management, and occupational health and safety systems. The difference between an occupational safety and health program and an occupational health and safety management system and how they are distinguished from one another, is unclear to many. Occupational health and safety management systems are typically set apart from traditional occupational health and safety programs by a more proactive approach, internal integration, and incorporation of an element of evaluation and continuous

improvement. Traditional occupational health and safety programs focus on the plan and do steps and tend to be reactive in response to workplace accidents. Occupational health and safety management systems such as the ANSI-AIHA Z10, OSHAS 18001, OSHA VPP, and UK BS 8800 all encompass W. Edwards Deming's (1986) plan—do—check—act process cycle of continuous quality improvement and are typically more proactive and functionally integrated into the organizations management model (Chemical Industries Association, 1995; Health Safety Executive, 1997; ILO, 2001; Tortorella, 1995).

The development of occupational health and safety management system standards led to the process of certification with the initiation of the ISO 9000, product quality and ISO 14000, environmental quality management system standards. Practitioners in the field have suggested that organizations achieve results when they transform the way they manage their business and implement a systems based model. With the initiation of the ISO 9000 Quality Management System, corporations implemented practices that provided for continual improvement and systematic elimination of underlying or root causes of deficiencies. The International Standards Organization (ISO 9001:2000) Quality Management System utilizes W. Edwards Deming's plan—do—check—act methodology for continuous improvement. The environmental field modeled this approach and standardized environmental management practices with the introduction of the ISO 14000 Environmental Management System.

The OSHA published the OHSAS 18001 and designed it to be compatible with ISO 9000 and ISO 14000 management system standards to integrate quality,

environmental and safety together. The ISO 9000, 14000, and the OHSAS 18001 are similar with each other and have the following system requirements: (a) leadership and management responsibility, (b) management of resources and processes, (c) system implementation, and (d) monitoring and measuring.

The ANSI-AIHA Z10-2005 contains the following basic elements: (a) management leadership and employee participation, (b) planning, (c) implementation, (d) evaluation and corrective action, and (e) management review. This cycle and management system below is represented as a circle that repeats itself for continuous improvement.

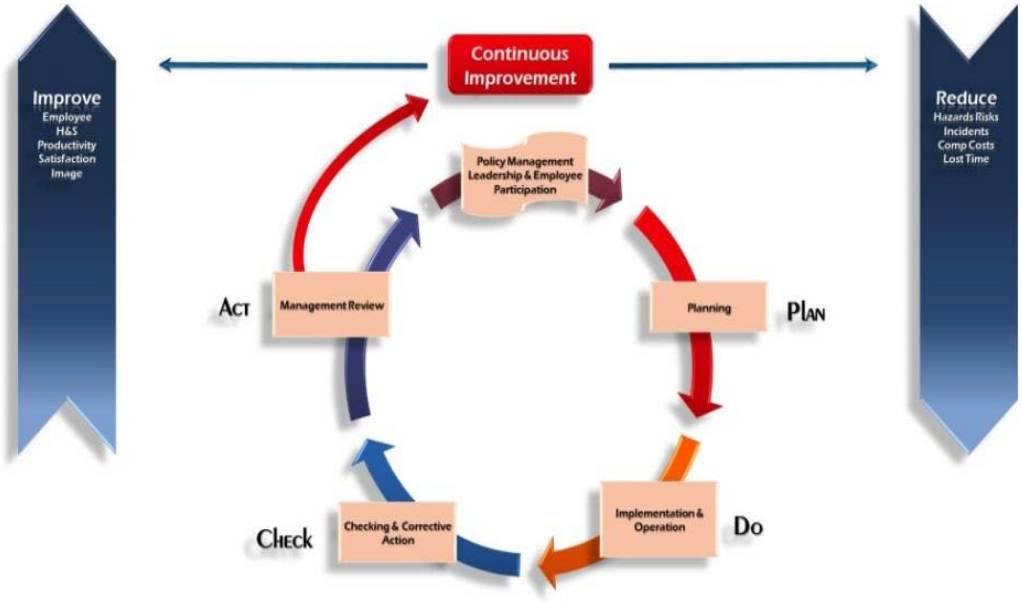


Figure 12. American National Standards Institute for Occupational Health and Safety Management Systems.

The Joint Commission and healthcare organizations utilize the plan—do—check—act method, originated from Deming (1986). The OSHA VPP sets performance-based criteria for an occupational safety and health management system and incorporates the following four areas: (a) management, (b) leadership and employee

involvement, (c) worksite analysis, (d) hazard prevention and control, and (e) safety and health training.

Occupational health and safety management systems have been used for decades internationally where two categories exist: mandatory and required by law, and voluntary where they are used as proprietary products sold on the market and validated by audit and certification. Voluntary systems are not linked to any governmental regulatory requirements, but most require the organization to comply with all relevant and mandated government regulations. What makes voluntary systems different than mandatory systems, is their focus on a large number of specified procedures as opposed to mandatory regulatory requirements. In voluntary systems, government-affiliated agencies or insurance agencies may offer incentives to organizations who volunteer to participate and implement such systems. Voluntary management systems are better structured to manage the risks for large accidents in big organizations. Voluntary management systems often require the use of audits and external certification.

Frick, Jensen, Quinlan, and Wilthagen (2000) defined a regulated occupational health and safety management system as a limited number of mandated principles for a systematic management of occupational health and safety applicable to all types of employers, including the small ones. Mandatory systems are promulgated by government legislation and are enforced through the inspection process. These systems are generally not as complicated as the voluntary systems as they are intended for both large and small workplaces. Mandatory occupational health and safety management systems cannot be certified. Only an inspection by the governmental occupational

health and safety authorities can validate a programs compliance with the mandatory system.

The European Union Framework Directive (89/391/EEC) is an example of a mandatory occupational health and safety management system for all member states. It requires them to:

1. Establish the responsibility of all employers to ensure the safety and health of workers at work, and to provide the necessary organization and means to do so;
2. Mandate that employers, taking into account the nature of their activities, assess and prevent or minimize occupational health and safety risks, as the primary means of fulfilling this duty;
3. Make occupational health and safety competence a compulsory base for employers' occupational health and safety management system;
4. Mandate a prevention hierarchy, in which the elimination of risks (safe place) comes first and personal protection and/or instructions (safe person) comes last;
5. Define occupational health and safety risks broadly as "the work environment" which includes, for example, the organization of work;
6. Require employers to adapt occupational health and safety conditions to the varying needs of each individual worker; and
7. Give workers and/or their representative legal rights to participate on all matters relating to occupational health and safety, without involving them in any costs. (Frick, 2006; Vogel, 1994; Walters, 2002).

Research Studies on Occupational Safety and Health Management Systems

There is much debate on whether occupational health and safety management systems have a positive effect on health and safety. Policymakers, regulatory agencies, and academics who are proponents for such systems have reported that implementation will automatically lead to better safety and health performance, as stated in the OHSAS 18001 Standard. Opponents to occupational health and safety management systems argue such processes are nothing more than excessive documentation and bureaucracy and may be more impressive on paper than they are in reality. The process of implementation and certification of an occupational health and safety management systems has been criticized for the excessive cost to the organization in terms of personnel resources needed to prepare, implement, and audit throughout the year. The certification becomes the central focus and reason for implementation (Zwetsloot, 2000). Questions remain concerning possible gaps between the promises and realistic outcomes of implementing occupational health and safety management systems.

Research conducted during the last 10 years showed that occupational health and safety management systems may not automatically improve health and safety, but can be used as a tool to affect health and safety (Gallagher, Underhill, & Rimmer, 2001). Additionally, researchers have shown a lack of consistency in the measurement techniques, an underreporting of the potential biases of those techniques, and difficulty in demonstrating conclusive evidence of the effects of occupational health and safety management systems on health and safety (Robson et al., 2005). Eisner and Leger (1988) reported the research on occupational health and safety management systems was (a) inconclusive because of the problems in defining what the system is, (b)

focused on individual elements of the system instead of on the whole system, (c) difficult to find reliable quantitative measures of performance, and (d) failure to find a correlation between system performance and injury outcomes.

Robson et al. (2005) conducted a systematic literature review to synthesize and find the best evidence on the effects of occupational health and safety management system interventions on employee safety and health and on associated economic outcomes. Occupational health and safety outcomes included changes in employee accident and injury rates and economic outcomes included changes in workplace workers' compensation rates and workplace productivity. Thirteen studies met the author's methodological quality study criteria with one of high quality and the rest with moderate limitations. Four studies reviewed occupational health and safety management system implementation in a single organization, a municipal government, a regional airline, a hospital, and an international manufacturing company. One study focused on multiple outcomes: (a) implementation, (b) occupational health and safety, and (c) economic outcomes. The others focused only on implementation of the system (Robson et al., 2005). One study reviewed economic outcomes.

Results of one reviewed study showed a 24% decrease in illness and injury frequency and a 34% decrease in lost time case rate over 3 years (Robson et al., 2005). During the implementation phase, management became accountable to the board of directors for improvement in the designated performance indicators. The results indicated a 13% decrease in workers' compensation cost per employee. There was no conclusive evidence to show that the outcomes were directly attributable to the changes in the occupational health and safety management system because of cost containment

initiatives going on at the time. Norway implemented the rule Systematic Health, Environment, and Safety Work Rule, also referred to as the Internal Control (IC) Regulation on January 1, 1992 which made it mandatory for organizations in Norway to establish an occupational health and safety system regardless of trade or size (Saksvik & Nytro, 1996). This rule was defined as systematic actions at the enterprise level to ensure and document the activities of health and safety control were performed in accordance with the Working Environment Act of 1977. A study conducted by Saksvik and Nytro compared the absenteeism and accident rates for private and public industries in Norway before and after the implementation of the IC regulation. Results of this study found that 58% of organizations had clearer lines of responsibility, 48% reported more/better risk assessments, and 42% reported new strategic plans. Regression models were able to explain only a small part of the total variance in absenteeism and accidents (Saksvik & Nytro, 1996).

The systematic review of the literature on the effectiveness of occupational health and safety management system implementation showed mostly favorable results. The evidence from these studies, however, was insufficient to make a recommendation either in favor of or against the effectiveness of implementing an occupational health and safety management system (Robson et al., 2005).

There is a body of research that favorably supports the positive effects of occupational health and safety management system implementation. The U.S. National Institute of Occupational Safety and Health (NIOSH) conducted effectiveness studies or safety climate studies in the 1970s to determine if a link existed between health and safety management practices and injury outcome data. The results of these studies

support (Quinlan & Mayhew, 2000) and the critical role played by senior leaders when it comes to their commitment. It also shows the importance of communication, employee involvement, and consultation as key factors in successful health and safety management. (Cohen, Smith, & Cohen, 1975; Smith, Cohen, Cohen, & Cleveland, 1978). Finally, Walters (2003) found evidence that safety management systems were effective for increasing employee participation on two levels.

Gallagher (2000) measured the effectiveness of different types of occupational health and safety management systems that resulted in a potential relationship between highly developed occupational health and safety management systems and better safety and health performance. Expert consultations performed in conjunction with this study endorsed this possibility only when demanding conditions were met. These conditions included: (a) occupational health and safety systems customized to the organization with stakeholder input; (b) senior leader commitment, proper resources, and accountability; (c) all organizational functions integrated into the safety management system; and (d) employee participation. Finally, the author concluded that the evidence of better safety performance was suggestive rather than conclusive.

Gunningham and Johnstone (2000) admitted that there have been few evidence-based empirical studies and conclusive evidence of the benefits of adopting an occupational health and safety management system but do maintain that an organization's best chance of achieving positive results is by implementing such a system. In a report by the Industry Commission of Australia, Gallagher (1997) found strong positive linkages between developed health and safety management systems and good health and safety performance, as measured by compensation claim incidence

rates. Gallagher and Rimmer (2003) concluded that despite the evidence being suggestive rather than conclusive, occupational health and safety systems can be beneficial, if and when a set of demanding conditions are met.

In an effort to find a tool to evaluate and objectively quantify the effect of implementing an occupational health and safety management systems in small and medium companies, Bianchini, Donini, Pellegrini, and Saccani (2017) found that an efficacy index could be successfully applied to collect useful information to understand the effectiveness of implementing the system. The efficacy index evaluated the economic effort and resources of the company in relation to the amount of money invested when mishaps occurred. Results showed prevention efforts were positive for the health and safety of employees but not cost effective for the company. Other researchers have found that only large companies offered these incentives, because smaller ones believed it cost too much and they had a smaller risk of mishap occurrence. The efficacy index was introduced in previous studies (Bianchini et al., 2017) used when an unpredictable mishap occurred where the company did not want to attribute the mishap responsibility to the effective implementation of the occupational health and safety management system.

Yoon et al. (2013) investigated the effect of implementing the Korea Occupational Health and Safety Agency 18001 for the top 100 construction companies in South Korea. The objectives of the study were to understand (a) the effect of occupational health and safety management systems through the analysis of accident rates, (b) the differences of occupational health and safety management system awareness between the site general managers and safety managers, and (c) the

differences among various construction types. Results of the survey showed differences in awareness of the occupational health and safety management system between site general managers and the safety managers. The differences found were motivation for developing the safety management system, external support needed for implementing the system, and problems and effectiveness of implementing the system.
Finally, the study results found the accident rate decreased by 67% and the fatal accident rate decreased by 10.3% during the period 2006 - 2011.

Hedlund (2013) performed a similar study and examined the association between (a) the implementation of the voluntary South African NOSA 5-Star safety management system and the rate of fatal and permanently disabling injuries for the period 1997-2000 and (b) the association between the Star audit rating and rates of serious occupational injury. The results showed those South African manufacturing companies who were committed to the 1997-1999 version of the NOSA System, experienced fewer fatal and permanently disabling injuries than the reference group---- the national average of manufacturing companies. The study also found an inverse correlation between the Star rating and the serious injury incident rate, meaning those companies with high Star ratings had lower fatal and permanently disabling injury rates than companies with low Star ratings (Hedlund, 2013). The conclusions suggested even though the Star rating may not be perfect, it is a sound predictor of injury rates. The author stated because the audit is voluntary, there may be a degree of distortion to the extent that some companies may abandon or take a break from certification if they experienced too many injuries and also that companies with poor safety attitudes are able to hide these things from auditors. The results of this study showed voluntary

occupational health and safety management systems can improve a company's accident performance and that audit systems are not perfect and do not seem to be able to synthesize partial disclosure of information and intentional deception by employees. Contributing factors to these conclusions cited an imbalance in the amount of information held by the company as opposed to the auditor, the desire to maintain good relations on the part of the auditor with the company, and a power imbalance between the auditors and those being audited.

Bottani, Monica, and Vignali (2009) conducted an empirical study on the performance of safety management systems in 116 adopting and non-adopting companies to determine if there was a statistical difference between them. Results of this study found the companies that adopted safety management systems showed a higher performance in (a) the definition of safety and security goals and their communication to employees, (b) risk data updating and risk analysis, (c) identification of risks and definition of corrective actions, and (d) implementation of employee training programs. A limitation of this study is that it did not show a causality or relationship of the results obtained to the implementation of the safety management system.

Mohammadfam et al. (2016) evaluated the performance of the Occupational Health and Safety Assessment Series (OHSAS) 18001 British Standard in large scale industrial companies involved in the design and construction of Iranian power, oil, and gas facilities. The evaluation compared specific criteria and indicators from the five core activities of the OHSAS 18001 in three certified and three noncertified companies. The five core activities were policy, planning, implementation, checking, and

management review. Each of the criteria had certain effects on the performance of the system. The specific criteria evaluated in the five core activities included (a) management commitment, (b) workers' involvement in occupational health and safety activities, (c) employee training, (d) hazard communication, (e) safety briefings, (f) accident investigations, (g) OSH inspections, (h) incentives and rewards system, (i) corrective actions, (j) safety managers' participation in safety meetings, (k) well documented safety rules and procedures, (l) safety promotion policies, (m) risk management, and many more. Results of the Mann-Whitney *U* test showed significant differences between OHSAS 18001-certified companies in the following specific criteria: risk assessment and corrective actions, communication and dissemination of information, and incident investigation. It may be concluded that safety performance in OHSAS 18001-certified companies is higher than in noncertified companies. This study supported the results of Bottani et al. (2009), which provided evidence that companies which do not adopt safety management systems have lower performance as compared with those who do. The study showed no significant difference for the following criteria: encouraging workers to participate in risk assessments, using safety data to prepare units' safety programs, workers' involvement in safety activities, performance measurement using lagging indicators, and the presentation of safety results during the development and review of safety programs and plans. The results indicated that certified companies were more likely to enforce safety rules and procedures and the level of employee training was higher in certified, than noncertified companies. The conclusion showed that occupational health and safety management systems improved

safety conditions and supported the health and safety of employees (Mohammadfam et al., 2016).

In a second study, Mohammadfam et al. (2016) used an integrated decision making approach of two techniques to assess and improve the effectiveness of the occupational health and safety management systems, in particular, the OHSAS 18001. The goal of the study was to fill the gap regarding the lack of rigorous methodology for assessing safety management systems and to identify the influential factors and effects on performance. The proposed method identified the most influential factors of the occupational health and safety management system based on their relative important weight. The results showed the most influential factors to improve the effectiveness of the OHSAS 18001 were (a) management commitment, (b) workers' participation, (c) allocation of financial resources, (d) training, (e) risk assessment, (f) defined responsibility, (g) communication, and (h) dissemination of health and safety results and activities. This study supported the research of Aksorn and Hadikusumo (2008) and Fernandez-Muniz, Montes-Peón, and Vázquez-Ordás (2007), which found management commitment was key to the successful implementation of occupational health and safety management systems.

Haas and Yorio (2016) measured the outcomes of occupational health and safety management systems in mining organizations to determine if insight could be integrated into current approaches of health and safety performance. Nine site level health and safety professionals were given 133 practices relating to 20 of the occupational health and safety management system elements. They provided feedback on how they assess the performance of each of the practices in their organization, or how they would assess

each practice if identified as a strategic imperative. Results using qualitative content analysis supported the findings of a balanced approach using quantitative and qualitative methods to obtain a holistic view of safety performance. The study's results recommended a mixed methods approach of evaluating occupational health and safety management systems performance. The use of quantitative and qualitative approaches showed the causal relationships and the intangible aspects of attitudes, beliefs, and behaviors of those in the organization. In addition, the results suggested using objective and subjective performance measurements, such as surveys and interviews to capture individual perceptions (Haas & Yorio, 2016).

OSHA regulators believe companies who implement occupational health and safety management systems will see benefits and positive outcomes in preventing injuries, illnesses, and fatalities. Autenrieth et al. (2016) conducted a study to determine the strength and significance of the associations between prior injury rates and OSHA On-Site Consultation Program assistance for the dairy industry. The OSHA On-Site Consultation Program offers companies the chance to have an on-site assessment of their occupational health and safety management system. The objective of the study was to determine if the occupational health and safety management system on-site assistance from OSHA was associated with lower injury rates for dairy workers, and if so, what elements and attributes of the management system stood out as likely to prevent injuries and illnesses in the U.S. dairy industry. Results showed no statistical significant association between occupational health and safety management system OSHA assistance and Total Case Incident Rate (TCIR) and Days Away Restricted Time (DART) accident and injury rates. There was a significant association between the

TCIR and DART accident and injury rates and the hazard prevention and control and management and leadership components of the safety management system. Higher levels of occupational health and safety management assistance from OSHA in the hazard anticipation and detection and management leadership components of the safety management system were significantly associated with reduced injury and illness rates (Autenrieth et al. 2016).

Weems (1998) completed a dissertation to identify the effect of participation in the OSHA VPP on injury and illness rates of industries from 1983-1997. Weems compared the company's injury and illness rates with the average reported by the Bureau of Labor Statistics for the years indicated above. In addition, this investigator sought to determine whether a relationship existed between injury and illness rates and years of participation in VPP. The companies studied participated in OSHA's VPP and achieved "Star Status" from its inception in 1982. The findings indicated that there were no significant relationships between the time a company was in the program and their injury and illness rate. Also, companies that achieved OSHA VPP Star status experienced lower injury and illness rates than their counterparts in industry, 63.5% below the industry average. The study showed there was no difference in the trends of injury rates experienced. The author concluded companies that participated in the VPP can expect a lower cost for workers' compensation and other accident related costs as a result of their lower injury and illness rate (Weems, 1998).

In his dissertation, King (2013) looked at the effectiveness of implementing the OSHA VPP on the reduction of workplace injury and illness rates of three pharmaceutical manufacturing companies. An employee survey was administered to

three VPP certified pharmaceutical companies to determine if the OSHA VPP process alone had improved overall safety performance at those facilities. Lost time and recordable injuries were reviewed along with their performance through a questionnaire survey that looked at the perception of employees on their safety culture. The findings indicated there were significant differences in the reduction of recordable work related injuries after OSHA VPP certification (*p*-value of 0.009, less than 0.05). The results showed statistical evidence from the employee perception survey that the OSHA VPP positively impacted a company's performance and added value to the effects of the health and safety performance in the reduction of injury and illness rates (King, 2013).

Summary

The literature review covered two parts: (a) accident causation and systems theory models, and (b) a review of research conducted on the effectiveness of implementing safety management systems in organizations. A review of the accident causation and systems theory models included Heinrich's Domino Theory of Accident Causation, the Modern Accident Causation Model, General Systems Theory, the U.S. Army's Systems Model, and a review of different safety management systems used throughout the world.

Heinrich's (1931) Domino Theory emphasized unsafe acts and conditions. This model was improved with the development of the modern accident causation model, which added individual errors, systems defects, and management errors into the model. The Modern Accident Causation Model introduced the systems concept which was not a part of the Heinrich model. The addition of the systems defect concept (weaknesses in

the way the system was designed or operated) signaled a critical change in accident prevention.

The next part of the literature review included a description of systems theory. A system can be defined as something whole in which one can draw a perceived boundary around it, identify internal and external elements, and inputs and outputs emerging from the whole. A systems theory is a theoretical perspective that analyzes the whole of a phenomenon and not just the sum of its parts. The goal is to understand the interactions and the relationships between all parts of the system in order to assess the systems functioning and outcomes. The systems concept was refined during the last century and became known as the systems theory (Bogdanov, 1922, 1980; Lazlo, 1996; Meadows, 2008; von Bertalanffy, 1968).

Von Bertalanffy's (1968) General Systems Theory describes how systems interact with components in the environment, a system of wholeness. A fundamental notion of the General Systems Theory was its focus on interactions. Von Bertalanffy's core theory emphasized the interrelationships between elements, which taken together, form the whole.

The basic elements of the Army Systems Model included: (a) task, (b) person, (c) training, (d) environment, and (e) material. The Army Systems Model was shown pictured together with the Modern Accident Causation Model in Figure 11 to show the interaction between the two. The Army Systems Model views the Army installation or organization as a system, one that has specific goals and missions. Each organization has its own unique set of inputs, or resources (personnel, material), required to

accomplish the mission. The military organization also has outputs, which in military terms is the accomplishment of the mission and goals.

In the first section of the literature review, the researcher covered the different definitions, structures, and types of occupational health and safety management systems used throughout the world. In the literature, the term occupational health and safety management system is used to describe different types of systems with different structure and practices. As a result, there are different approaches that exist with some promoting of a few of the required elements and others promoting more. There are differences in primary focus with some emphasizing prevention, the employer's responsibility or even employee participation. It is therefore best to specify what occupational health and safety management system is being described at the time (i.e., the ANSI-AIHA Z10, the OSHAS 18001, the OSHA VPP, or the UK BS 8800). There is also a challenge on a common definition of an occupational health and safety management system. In addition, it is not clear to most how an occupational health and safety program differs from an occupational health and safety management system. Traditional occupational health and safety programs focus on the "plan" and "do" steps and tend to be reactive in response to workplace accidents. Occupational health and safety management systems are more proactive and encompasses the entire plan—do—check—act process cycle. They are functionally integrated into the organizations management model and incorporate elements of evaluation and continuous improvement.

The last section of the literature review included studies conducted on the effectiveness of implementing safety management systems in organizations. Research

conducted during the 1990s showed that occupational health and safety management systems may not automatically improve health and safety, but can be used as a tool to affect health and safety (Gallagher et al., 2001). Additionally, researchers showed a lack of consistency in the measurement techniques, an underreporting of the potential biases of those techniques, and difficulty in demonstrating conclusive evidence of the effects of occupational health and safety management systems on health and safety (Robson et al., 2005).

More recent studies such as that of Mohammadfam et al. (2016) supported the research of Aksorn and Hadikusumo (2008) and Fernandez-Muniz et al. (2007), which found that management commitment was key to the successful implementation of occupational health and safety management systems. Mohammadfam et al. (2016) showed significant differences between OHSAS 18001-certified companies in the following specific criteria: risk assessment and corrective actions, communication and dissemination of information, and incident investigation. These authors concluded that safety performance in OHSAS-18001 certified companies is higher than in noncertified companies. This study supported the results of Bottani et al. (2009) which provided evidence that companies which do not adopt safety management systems have lower performance as compared with those who do.

Chapter 3: Methodology

Research Design/Model

The research design is a road map which allows the researcher to begin with a specific series of questions and end with a set of conclusions and answers to those questions. A research design is similar to a blueprint, which sets the stage for the conduct of the research and guides the investigator in what questions to study, what data are relevant to collect, and how to analyze the results (Philliber, Schwab, & Samsloss, 1980). The design ensures that the data collected during the course of the study relate to the initial research questions.

The researcher used the General Systems Theory as the theoretical basis for this study because it focuses attention on the whole and the complex interrelationships between its parts, instead of the parts themselves. Case study fits well with the general systems theory as it allows for the investigation of a more tangible and bounded system. Systems theory is a holistic approach and pivots attention away from the part to the whole (Checkland, 1997; Jackson, 2003; Weinberg, 2001). The results are system elements that are rationally connected towards a shared purpose (Mele et al., 2010).

Descriptive attributes of the General Systems Theory are (a) inclusion, (b) embracing, (c) collaboration, (d) team work, (e) learning for life, (f) comprehensive, (g) universal accumulation of knowledge and wisdom, (h) global in approach, (i) holistic, (j) higher level vision, (k) interdisciplinary, (l) focus on relationship between the parts, (m) each element is affected by at least one other element in the system, (n) each element has an effect on the functioning of the whole, (o) focus on the events produced

because of the interaction of the parts, and (p) focus on the relationship between the parts. The general systems theory is depicted below.

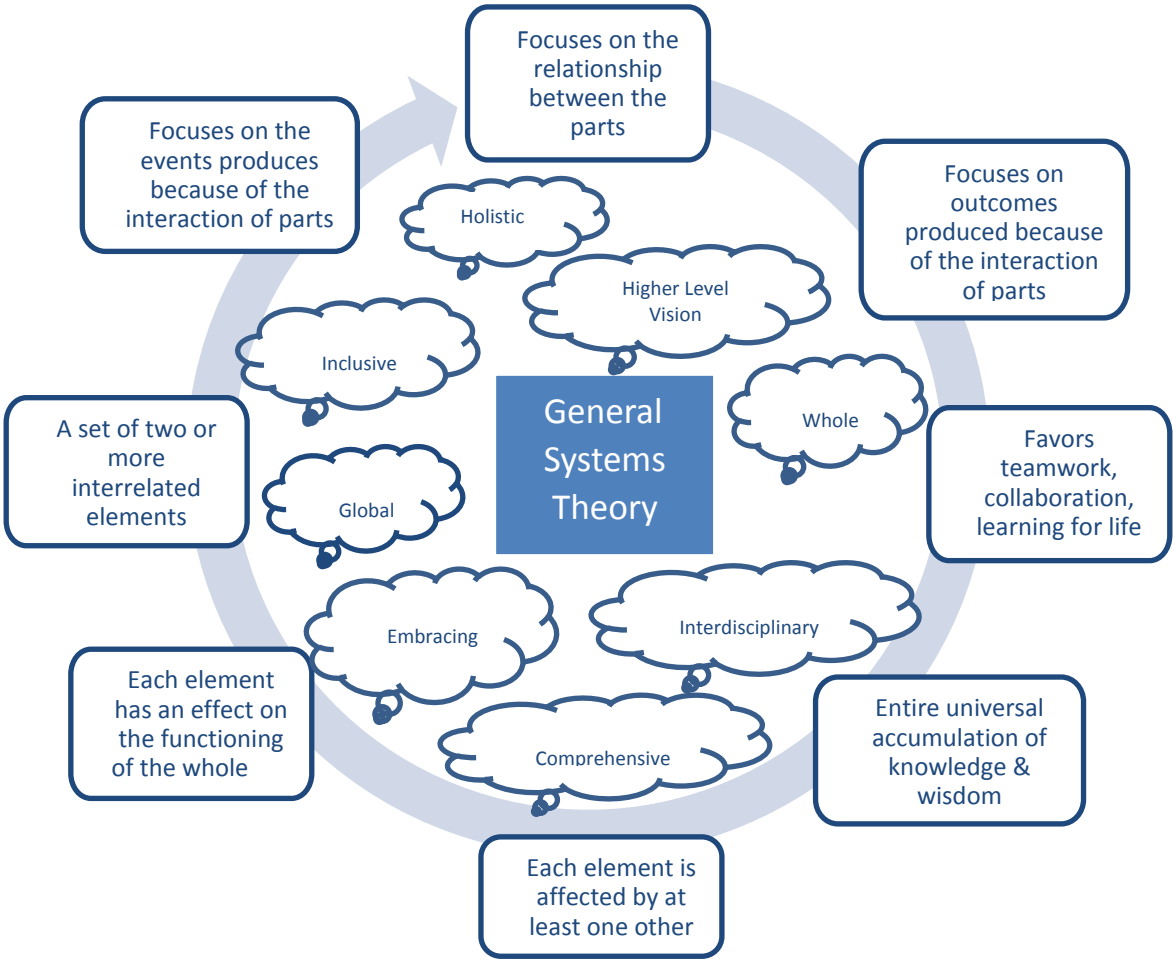


Figure 13. General Systems Theory Model.

The OSHA VPP safety management system itself reflects elements of the general systems theory as it depends on the interrelationship, integration, and collaboration between the four separate elements of the safety management system: (a) management, leadership commitment and employee involvement, (b) hazard control and prevention, (c) worksite analysis, and (d) safety and occupational health training.

Case Study

Yin (2003) described the definition of a case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. Yin stated that the case study inquiry copes with distinctive situations where there will be many more variables of interest than data points. As a result, it relies on multiple sources of evidence and the need to converge the data in a triangulating fashion.

This study fits Yin's (2003) definition of what constitutes a case study design. The topic explores a complex, real-life scenario, asks a *how* or *why* type of question, and there is little or no control over the situation being studied. Because the current research question involved a *how* or *why* question, it met the definition of an explanatory case study.

Research Questions

The general research question for this study was to determine the effect of implementing a safety management system, specifically the OSHA VPP, and its impact on safety culture at the Illesheim Army Health Clinic. The general research question was divided into the following subset of four questions for clarity and detail:

1. How does implementing the OSHA VPP safety management system affect employee and patient satisfaction?
2. How do employees feel about adding the OSHA VPP safety management system to their workload in addition to the hospital accreditation and the Army Safety Program?
3. What effect does the OSHA VPP have on staff morale?

4. How does implementing the OSHA VPP affect leadership commitment and employee involvement?

Unit of Analysis (the Case)

The overall unit of analysis was the case of the Illesheim Army Health Clinic. Subunits of analysis included staff from the following nine work groups:

1. U.S. civilian employees at the clinic.
2. Local national civilian employees at the clinic. The definition of a local national civilian employee is someone who is of another nationality other than American.
3. Soldiers at the clinic.
4. Supervisors at the clinic.
5. The additional duty safety officer at the clinic.
6. The full-time safety manager at the U.S. Army Department Activity, Bavaria (BMEDDAC), headquarters of the clinic.
7. The supervisor of the additional duty safety officer.
8. The supervisor of the full-time safety manager.
9. Those in leadership positions at the clinic (the commander, chief nurse, and medical director).

The unit and subunits of analysis were the main entities that the researcher analyzed. The subunits of analysis were the people interviewed, which resulted in a thick rich description and explanation of how the employees felt about the OSHA VPP and its impact on the safety culture of the unit. Organizations are easier to operationalize because the organization itself provides clear boundaries of who will be included in the study.

The Illesheim clinic provided ambulatory and medical clinic functions for 2,500 beneficiaries including active duty military personnel, retirees, and dependents. The medical staff at the clinic included physicians, pharmacists, nurses, social workers, behavioral health specialists, and technicians. The staff was made up of military and civilian (host nation and U.S.) providers. The clinic supported three major battalions, with 95% of the workload geared to the medical care of Apache helicopter aviation personnel. The patient load at the clinic was in a continual state of flux, with constant deployment and reintegration of combat units. The unit was an integral part of the United States Army Garrison in Ansbach, Germany, which had a tradition of supporting military personnel and their families overseas.

The clinic was situated among two small buildings with a working area of 4,000 square feet. The main building at the clinic consisted of command offices, examination rooms, blood labs, pharmacy, x-ray equipment, and an audiometric testing center. The second building was an administrative building consisting of office space, a conference room, and storage areas. The clinic was structured under the ERMC and was supported in terms of occupational and health and safety by the BMEDDAC safety office.

Data Collection Procedures: Interviews, Document Review, Observations

The researcher conducted open-ended, in-depth interviews from the nine work groups. The researcher interviewed two U.S. civilian employees from the clinic to get a perspective from a government civilian employee on any perceived benefits or drawbacks to implementing the VPP Program. The researcher was interested to see if the high turnover in civilian personnel in addition to adding an additional layer of safety compliance (OSHA VPP) would affect the level and standard of safety at the clinic.

There was no union representation of U.S. civilian employees at this work site because there is no union present in Germany to represent U.S. civilian government employees stationed overseas.

The researcher interviewed two local national civilian employees from the clinic to see if there were any cultural differences relative to any perceived benefits or drawbacks of implementing the VPP. There were a total of five local national employees working at the clinic. Two of the five employees volunteered to be interviewed; three declined. The perspective from the local national employee is important because there is a union for local national employees called the "works council." The designated works council representatives play a very active role in ensuring a safe work environment for their work colleagues in Germany.

There is a pre-employment requirement for all local national employees of the clinic to be able to read, write and speak the English language. All local national employees at the clinic could understand, read, and write English, and did not need any written material, verbal instruction, or questioning translated into the German language.

The researcher interviewed two soldiers from the clinic to get the military perception on any perceived benefits or drawbacks to implementing the VPP. Obtaining the perspective of the military is important because soldiers, enlisted and officers, are trained and educated to be safety officers beginning with initial entry into the Army. The military workforce rotates jobs and locations every 2 to 3 years, so there is a constant rotation of soldiers arriving and departing the clinic on a regular basis. The researcher was interested to see if the high turnover in military personnel in addition to

adding an additional layer of safety compliance (OSHA VPP) would affect the level and standard of safety at the clinic.

The researcher interviewed two supervisors at the clinic to get their perspective as individuals responsible for achieving results and ensuring safe patient care. The researcher also aimed to see whether the implementation of the VPP had an effect on additional resources necessary.

The researcher interviewed the additional duty safety officer at the clinic to get the perspective from the individual most responsible at the clinic for championing, leading, and implementing the process necessary to achieve the VPP and to determine if there was an impact on resources.

The researcher interviewed the full-time safety manager at the BMEDDAC headquarters was to understand the perspective of the individual directly responsible for setting the overall goals, objectives, policies, and procedures for implementation of the VPP for the region.

The researcher interviewed the supervisor of the additional duty safety officer at the clinic to obtain insight on the balance between the amount of time and resources dedicated to the VPP compared to the Army Safety Program and the Joint Commission.

The researcher interviewed the supervisor of the full-time safety manager, the BMEDDAC deputy commander for administration, to get the perspective of a leader who must balance the resources of the facility to produce safe, quality, and efficient healthcare while dealing with internal and external stakeholders and demands in a constantly transforming environment of reduced resources.

Lastly, the researcher interviewed the Illesheim clinic commander, chief nurse, and the medical director to get the perspective of senior leadership in the clinic who are charged with providing safe, quality and efficient healthcare and balancing internal and external competing demands on their time and resources. The researcher selected this group to see their level of commitment and involvement in the safety program.

The size of the clinic, according to the personnel roster in July 2013, showed a total of 32 personnel. The civilian personnel manager of the ERMC provided a roster of civilian employees as of August 2013. The roster showed a total of 10 U.S. civilian and five local national employees working at the clinic. Three U.S. civilians did not meet the eligibility criteria of being employed at the clinic from January 1, 2011 to June 1, 2012: three left the clinic, one declined, and one was not available. The researcher interviewed the two remaining individuals.

The roster of local national employees showed a total of five individuals working at the clinic. All five employees met the criteria of being employed at the clinic from January 1, 2011 to June 1, 2012. Three employees declined the interview and the researcher interviewed the remaining two employees.

The chief military personnel officer for the ERMC provided a roster of soldiers to include enlisted and officers in the clinic dated July 8, 2013. The roster showed a total of two officers and 15 enlisted soldiers working at the clinic. Of the 15 enlisted soldiers, seven did not meet the eligibility criteria of being employed at the clinic from January 1, 2011 to June 1, 2012; their arrival date at the clinic was later than June 1, 2012. Four enlisted soldiers were not available, and one had already left the clinic.

Three enlisted soldiers met the eligibility criteria; the researcher interviewed these soldiers and the two officers on the personnel roster who met the eligibility criteria.

The intent of the research design was to interview a total of 15 individuals, 13 from the Illesheim Army Health Clinic and two from the BMEDDAC headquarters. The researcher interviewed only 11 individuals, however, as many of those who fit the inclusion criteria had left the clinic. There were new employees present who did not meet the inclusion criteria. Due to the small size of the clinic, a few employees had dual titles and responsibilities.

Selection of the individuals interviewed was not random. The researcher used the personnel list from the ERMC chief of military and civilian personnel as of July 2013, which listed all military and civilian employees in the clinic, the date they began work at the clinic, their department and position title. On arrival, the researcher provided an information brief to the entire clinic. The briefing included an overview of the research project, the purpose, process, and procedures for the conduct of the interviews. The researcher highlighted the individuals on the personnel roster who met the inclusion and exclusion criteria. Inclusion criteria allowed for the U.S. and local national civilian employees to be contract employees and employed at the Illesheim clinic between January 1, 2011 and June 1, 2012. The Illesheim commander, chief nurse, medical director, supervisor of the BMEDDAC safety manager, the Illesheim clinic additional duty safety officer, and the supervisor of the Illesheim clinic additional duty safety officer were exempt from the criteria of being employed in the clinic since January 2011, as most of the individuals in these positions are military and rotate every 2 to 3 years.

The researcher asked the individuals who met the inclusion criteria from each category if they would be willing to participate. The researcher reviewed the study information sheet and the consent form with each participant, as well as the use of a tape recorder before the interview took place. No one objected to the use of the tape recorder and all 11 participants were tape recorded. The researcher kept written notes during each interview for each question asked of the participants. The written notes were transcribed first followed by the use of the tape recorder to transcribe them into full exact text. The researcher conducted all interviews face-to-face in the clinic's conference room with no third party present. The door was secured and only the investigator and the subject were in the room to ensure privacy for each person interviewed.

In addition to open-ended, in-depth interviews, the researcher reviewed critical documents to corroborate the interview data. These documents included the Illesheim VPP annual evaluations for fiscal year 2011, 2012, and 2014, ARAP safety climate surveys, patient satisfaction surveys, and clinic safety inspections. The researcher performed direct observation of the following events: (a) BMEDDAC safety and environment of care council meeting, (b) the clinic morning huddle, and (c) a routine walk through observation of the physical environment of the clinic.

Chapter 4: Results

Introduction

The purpose of this study was to determine the effect of a safety management system, specifically the OSHA VPP, and its impact on safety culture at the Illesheim Army Health Clinic. The researcher collected data from in-depth, open-ended interviews, document review (Illesheim VPP annual evaluations for fiscal year 2011, 2012, and 2014, ARAP safety climate surveys, patient satisfaction surveys, and clinic safety inspections), and direct observations (BMEDDAC safety council meeting, clinic morning huddle, and a routine walk through observation of the physical environment of the clinic).

The general research question for this study aimed to determine the effect of implementing a safety management system, specifically the OSHA VPP, and its impact on safety culture at the Illesheim Army Health Clinic. The general research question was divided into the following subset of four questions:

1. How does implementing the OSHA VPP safety management system affect employee and patient satisfaction?
2. How do employees feel about adding the OSHA VPP safety management system to their workload in addition to the hospital accreditation and the Army Safety Program?
3. What effect does the OSHA VPP have on staff morale?
4. How does implementing the OSHA VPP affect leadership commitment and employee involvement?

Results of Research Question 1

Results from the interviews with clinic employees revealed an overwhelming number of positive examples for how the VPP helped them achieve high patient satisfaction results. The feelings from the clinic employees when asked if the OSHA VPP had positive outcomes for the clinic in terms of employee and patient satisfaction are shown below:

> "VPP did have a positive outcome in terms of the military soldiers who would lay salt on the sidewalks during the winter time. Other units on post do not take these steps. We do this every year. We had to treat a patient that had a fall in another facility here on post, which did not take the safety measures that we do. Our soldiers clean the floors when there is rainy weather outside. The satisfaction comes when we don't have people injured in the clinic, or staff members getting injured, and the patient's access to care stays the same. It is one of those things people don't realize until it is not there." (See Appendix B)

> "It absolutely had an impact on customer satisfaction. Customer satisfaction comes a long way. If we harp on customer satisfaction, it becomes apparent. I have seen it here, through our command culture with our previous commander, it was very patient centric. The culture he created here reminded me of being a manager of a restaurant before I joined the Army. We approached them with a positive attitude and smile

on our face. I believe the culture our previous commander created really added to customer care and satisfaction without a doubt." (See Appendix B)

"In keeping with the OSHA VPP and making sure the environment was kept to a certain level, I think that increased our patient satisfaction. Our monthly Army Provider Level Satisfaction Survey (APLSS) scores show as far as the cleanliness of the clinic and the way we are insistent on it, is in the upper 90th percentile. If the patients see a place that looks like it is clean and safe, then they are more likely to say they are getting better healthcare." (See Appendix B)

The results taken from the document review of the APLSS patient satisfaction survey data of the clinic 6 months before and after the implementation of VPP showed an increase in the mean scores rated "excellent" and "very good" in staff courtesy and helpfulness, phone service, coordination of the visit, and cleanliness and comfort of the facility. The mean scores for staff courtesy and helpfulness increased from 82.02 to 94.9. Additionally, the mean score for phone service increased from 63.05 to 87.82. Next, the mean score for the patient's coordination of the visit increased from 81.78 to 92.7. Finally, the mean score for the cleanliness and comfort of the facility increased from 84.96 to 93.9. In describing positive outcomes, employees knew that the clinic achieved the upper 90th percentile for patient satisfaction on their monthly APLSS

scores. Although the clinic historically achieved high scores on their APLSS patient satisfaction surveys, one employee said:

> "Keep in mind, the clinic was always, historically a high scoring clinic on the APLSS patient satisfaction survey. Still, I think the implementation of the OSHA VPP did help further to improve it. It did improve, I think, because of a higher level of staff awareness, and further mitigation of accident or incident related losses which resulted in the increased availability of providers and staff to perform safe patient care." (See Appendix B)

One employee said that customer satisfaction was the non-safety related outcome of implementing VPP. Because employees bought into the new culture and were an active part of it, the new culture transformed the dynamic in the way patients were treated and cared for. Another employee stated the reason Illesheim was one of the top scoring clinics in terms of patient satisfaction was due to how they did business in relation to the VPP concepts. One employee gave credit to the VPP process in increasing patient satisfaction as it related to access to care, continuity of care, and being able to see the same provider. Examples of patient satisfaction were seen when customers arrived at the front desk, when they interacted with the providers and medics, and in the performance improvement activities such as installing the covered indoor access to the patient liaison office from the medical treatment building. Noting the positive impact on patient satisfaction, one employee said:

> "Our customer satisfaction is very high within the BMEDDAC, we are one of the best. We are at 92% - 94% which is one of the best in the BMEDDAC. We have a cautious effort which is done right from the front desk, to the medics, to the providers. The same thing in terms of safety shoes in the laboratory, in the pharmacy, we have thought about patients having a tough time going over to TRICARE [Health Care Program of the U.S. Department of Defense Military Health System], going through snow and ice to pick up their referral. I think that will automatically come back in our APLSS scores and the patients are going to be pleased." (See Appendix B)

When employees were interviewed and asked "How does implementing the OSHA VPP safety management system affect customer satisfaction?" 55% agreed the implementation of the VPP had a positive impact on customer and patient satisfaction, 18% said there were no positive outcomes, 9% said they did not know, and 18% did not answer the question.

In describing the impact VPP had on customer satisfaction, the participants gave examples about soldiers who spread salt on the sidewalks during the winter and cleaned floors when it rained to mitigate hazards for patients and staff. The customer satisfaction came when people were not injured in the clinic. A theme throughout the interviews was that the culture was very patient-centric. If clinic personnel could not do something for the patient, they found an answer and a way to make it happen. They

would never say that something was impossible to do. One employee believed patient satisfaction increased because of the OSHA VPP and the emphasis to keep the environment at a certain level.

A review of the VPP annual evaluation included the clinic's project to improve staff and patient slips, trips, and falls when walking between the two clinic buildings in inclement weather. The clinic initiated and completed a project to connect the two buildings together with an enclosed corridor so the patients could safely get to the administrative offices from the patient care area. In the interviews, employees spoke about placing salt in the parking lot during winter, ordering and replacing mats at the clinic entrance, being one of the BMEDDAC's top performing clinics for patient satisfaction, and achieving a 100% on their patient satisfaction surveys for 5 months straight. Employees stated that they were the only clinic in the region to achieve this. Another employee said that VPP transformed the way and the dynamic in which they cared for patients in a positive way. Results of the interviews and the patient satisfaction survey data showed that patient satisfaction was high for this clinic.

Results of Research Question 2

The second research question asked, "How do employees feel about adding the OSHA VPP safety management system to their workload in addition to the hospital accreditation and the Army Safety Program?" This question resulted in 64% of the employees saying no, there was no additional burden in terms of resources needed to implement/sustain VPP as opposed to implementing the Army Safety Program or the Joint Commission; 27% of the employees said yes, there was an additional burden in terms of resources needed to implement/sustain VPP as opposed to the Army Safety

Program or the Joint Commission; and 9% of the employees said initially yes, there was an additional burden in terms of resources, but not anymore.

One participant believed there was no additional burden in terms of resources said:

> "If you are efficient in your operation you can achieve it. The clinic was just concentrating on things that had already been in place, perhaps approaching it in a different manner and taking it to a new quantitative value." (See Appendix E).

However, some employees stated, that the implementation of VPP came with a cost in terms of workload and resources. One said that they did not see a difference in the clinic before as opposed to after VPP implementation and another did not know anything about it. One employee who believed it required more resources in the beginning but not after the program was implemented said:

> "There was a significant amount of time that was involved with the individuals who were the champions and running with the ball. Once it was developed and implemented, then maintaining it is far easier. The initial push was a significant investment of time on everybody's part. Now that it is running, I do not see that it takes anything away. Now that the practices are being used, then they just become a way of doing

business. For the Army, we use the term battle rhythm, it is just the way we do our normal business." (See Appendix B).

Another employee said it is possible to do if you have an executive officer, a chief nurse, and the required clinic personnel. One employee stated, that if your Joint Commission books are in order, you will be good for VPP, saying that all requirements nest and support each other. He further said there are no new requirements for VPP that are not already part of the Army Safety and Joint Commission programs, summarizing that the Joint Commission is the program that requires more time and the VPP is more common sense. He added an additional comment to include that the only extra resource might be the training portion. Another individual said the clinic was always strong in safety even before VPP. VPP only perfected the process and the clinic was able to give a name to it. This employee thought achieving VPP was easy and not traumatic. Because the clinic was transforming and implementing the Patient Centered Medical Home model to include morning huddles, this made it easier to communicate safety issues and challenges to each other on a daily basis. One employee expressed the following thoughts:

"Once we got the flag and our recognition, we still followed that protocol. It has always been strong on day one, it is strong now, and I believe it was strong before VPP too. Again, I do not know how much we changed. I always felt we were doing the right thing for the last 3 or 4 years. It just seemed like we honed that and we gave it a name. So, it was

> really not traumatic, it was kind of easy for us to do. Because we were going to the Patient Centered Medical Home Model, we can look at our colleagues in the morning huddle and say, we will do this, oh, my lab is not working today, I don't have these chemicals, or that may be a safety issue." (See Appendix E)

Three individuals said yes, there was an additional burden in terms of resources needed to implement/sustain the VPP, as opposed to the Army Safety Program or the Joint Commission Program. The reasons included there was significant time involved for those who were the champions and in charge of the VPP; however, once it was fully implemented, it became much easier. This individual said that now it was running, it became a way of doing business. Second, all three programs required time away from patient care. And third, the Army Safety and Joint Commission Program reflect on the minimum requirements whereas the VPP establishes parameters that exceed minimum requirements. Results of the interviews suggested that the employees felt there was no additional burden in terms of resources to implement and sustain the OSHA VPP as opposed to the Joint Commission and the Army Safety Program.

Results of Research Question 3

The third research question asked, "What effect does the OSHA VPP have on staff morale?" In interviews, employees at all staff levels said the leadership participated and led by example. They said they saw their leaders participating in safety activities their subordinate employees were participating in, leading by example. Employees said their fellow staff members looked out for each other, and were

concerned about mitigating safety hazards not only for patients but for their own colleagues. Most realized their voice was important and heard. They knew their concerns and recommendations would be acted upon by leadership. It was a common occurrence that employees would freely bring safety hazards and solutions for improvement to the attention of their commander. They felt empowered to correct and fix safety hazards on their own. One component of morale is the enthusiasm of the people for what they are doing. The clinic personnel were excited, motivated, and proud to be an active participant in the clinic safety program and were willing to share this information freely during the interviews.

The findings from the interviews support the observations of the daily morning clinic huddle where all employees stood in the hallway and communicated safety issues of concern within and outside of the clinic. During the huddle, employees took the opportunity to educate everyone on mishaps that occurred, safety improvements that were made in the clinic, and ongoing safety initiatives with each other, the commander, and clinic leadership. There was a high level of energy and inclusiveness shown by all employees during the morning huddle, which was conducted on a daily basis.

A review of the clinic 2012 VPP annual evaluation of the safety management system showed the clinic leadership initiated a VPP hazard reporting recognition program. Employees were rewarded in large forums for submitting work requests or initiatives to correct unsafe conditions or hazards in the clinic. The evaluation said employees were given motivational rewards to those who reported near-misses and completed safety hazard/VPP work requests to fix safety problems. During a walk-through of the clinic, the researcher spoke with the housekeeper who said he was one of

the winners of the VPP hazard reporting recognition program. He said because he was in and out of every room in the building he had the opportunity to see where there were safety hazards that needed corrected which enabled him to participate and win the recognition award. He displayed commitment and pride for his work and his contribution to the organization's safety program.

Morale can also be described as the confidence of individuals or groups with regard to the function or task at hand. Clinic personnel displayed a high degree of confidence which was evident throughout the interviews and observations during the building walk through. Employees knew they were high performing in their monthly patient satisfaction survey results, better than their peers in other clinics within the BMEDDAC region. They knew they were among the first within the region to achieve the Patient Centered Medical Home Model and the National Certification for Quality Analysis. Employees were excited they were the first in the MEDCOM to pilot and achieve the OSHA VPP certification. Finally, they were proud they were a resource and example for everyone in the MEDCOM and their success was visible with the on-site award presentation of the Army Star Strong Flag from the Director for Safety, Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health. All employees knew the importance of the pilot program they successfully implemented would become the template and doctrine for all other Army medical facilities world-wide. All these events inspired a source of pride and enthusiasm within the employees at the clinic. They indicated they were happier because they felt their voices were heard and they had better and open communication between themselves and their leadership.

The BMEDDAC deputy commander for administration noticed the difference VPP made when he first walked into the clinic. He saw a difference in terms of a special culture established at the clinic, beginning when a visitor approached the front desk and signed in. Employees working there gave the visitor a safety orientation to the clinic and pointed out the emergency exits and other safety precautions. He stated the front desk employees did this for every visitor to the clinic. The BMEDDAC deputy commander for administration said he believed this was the only clinic within their region that did this.

The commander of the clinic said from his 26 years of experience in the Army, safety was something forced upon people. He noticed upon arriving at the clinic after VPP implementation that everyone looked out for their fellow-staff members and patients all of the time. He mentioned that almost every single employee at the clinic had brought a safety issue, or something that needed fixed to his attention; he had never seen an environment like this before. He explained that in his experience, people typically ignored a floor that was wet, walking by and closing their eyes to it. At the clinic, he saw every staff member drying the floors at one time or another. He reported seeing his employees do many things for patients and fellow colleagues, actions he had never seen anywhere else. The clinic medical director said:

> "Implementing VPP had a huge impact. This is something completely different. This is like a changed perspective. This is every day now. This is how we take care of our folks in the clinic, how we take care of ourselves." (See Appendix F)

Many employees stated that achieving VPP gave them a sense of pride in being the first clinic within ERMC to achieve this recognition. It was a building block and a confidence builder that helped them achieve National Certification for Quality Analysis (NCQA). The clinic received accolades from the higher chain of command through ERMC, MEDCOM, to the Department of the Army. They became a resource and an example of what can be accomplished with the rest of the Army hospitals and clinics in MEDCOM. The clinic received a personal presentation of the official Army Star Strong flag and certificate from the Army Safety Director representing the Assistant Secretary of the Army, Installation, Energy, and the Environment. Another positive outcome was that it gave every employee a voice to identify and correct safety hazards. Employees realized their voice was important, what they felt and what they saw was important, and leadership got involved to correct hazards or deficiencies. Knowing their voice was recognized encouraged people to say something and speak up.

When asked what VPP and Army Star Strong meant to them, one employee talked about pride:

> "I think it is a sign of pride for us. I wish they could have come up with something like this before. It was just a constant little phase where we said ok, this side is patient safety, there is a thing called environment of care and safety. Which our safety manager has talked to us about: chaining the photographs, chairs in the corridors, and fire hazards. And now there is VPP, it just takes it all to a different scale. Oh yes, there is snow and ice out there, and how is this person with crutches who has

been screened, going to go all the way down to the administrative building and pick up a referral? This is a mind change now. This was not there before. And now it just flows very beautiful." (See Appendix J)

One staff member said the pride they felt from achieving the award encouraged employees' to be more alert on safety issues. This was evident from the interviews and the document review that employees brought hazards and deficiencies up to leadership all the time. Employees talked about safety issues at the end of the day on Fridays for the active duty and gave safety tips. Clinic personnel had a sense of pride in their culture. They were constantly reminded they were one of the best clinics in the Army, which improved their culture and how they felt about themselves as a unit. The clinic was aware their organization achieved a position of fame and recognition. Other clinics asked them for their help and assistance because of what they achieved. Being the first to achieve an important recognition gave them a feeling of honor and prestige. For some, the most positive outcome was the patient satisfaction. The patients liked to come to this clinic and they liked the care they received.

One employee said the clinic was a great shining example of what a clinic should be. Employees described how patients can see the difference, in what takes place in the clinic, and in the pride the employees show. They said it changed the mentality of the organization to a picture of what right looks like. They said improving patient safety was also improving employee safety at the same time.

The BMEDDAC safety manager agreed that VPP made a difference; he said it fostered the reporting of near miss situations, which enabled the clinic to proactively approach safety related situations. The safety manager stated that VPP supported a safe work environment, which automatically improved patient safety as an overall outcome. He gave two examples of the positive safety culture at the clinic. The first example involved not having any mats in the lobby at the entrance door. After employee and leader involvement, the clinic ensured there were mats in front of all the doors in the buildings. The second example involved the safety issue of damaged office chair mats. Their initiative resulted in removing the damaged mats from beneath the provider's workstations to prevent injury and accidents from occurring.

The chief nurse, also the additional duty safety officer, responded that "the implementation of VPP definitely had positive outcomes in terms of safety." He cited examples of employees that took the initiative on their own and cleaned up wet floors and removed mats at entrance ways that were tripping hazards. Employees would notify their supervisors when they fixed a safety hazard that could have caused an accident. The implementation of VPP enabled employees to have a core understanding and to find ways how they could improve their service to their patients, customers, and staff. This way of thinking integrated itself into every aspect of how the employees worked.

Many employees said there was more awareness and proactive approaches to identifying and solving safety issues. Many were able to describe the positive outcomes such as being the first clinic within the MEDCOM to achieve the VPP recognition, knowing their clinic had the best patient satisfaction scores in the command, and that they set the standard for medical units and others in the Army to achieve.

When asked about the positive outcomes and milestones of VPP, 82% of the employees responded yes, they believed the implementation of the VPP had a positive effect in terms of safety outcomes safety performance. Their responses reflected more than just complying with safety program requirements. They spoke of a mind change, taking safety to a different level, a sign of pride, setting a higher standard than what is required, changing the mentality, building a culture of safety that is more a part of their business, and giving everyone a voice. The majority of employees knew they were the first clinic in MEDCOM to achieve VPP and they set the standard for the Europe region and the entire MEDCOM. They felt a sense of pride, prestige, and recognition in this accomplishment. One employee said:

> "Essentially means I work at Illesheim and we were the first clinic to have led the pack in many things to include the VPP status. We were able to do it in 17 months of implementation. Everyone in the Army Medical Command knows what we did and the things we achieved so we have bragging rights. VPP means to me, there is an emphasis on safety. It means looking at and developing controls for issues before they become problems. Identifying the risk and hazard and putting controls into it. Everyone can have a voice to say something." (See Appendix J)

Results of Research Question 4

The fourth research question asked, "How does the OSHA VPP affect leadership commitment and employee involvement?"

When the Illesheim Army Health Clinic achieved VPP certification in June, 2012, the unit was under the leadership of their third unit commander since the clinic first volunteered to implement the VPP in January 2011. Each of the three unit commanders had never implemented the OSHA VPP before but were all willing and motivated to start, continue, and achieve the implementation of this safety management system approach at the same time as they were implementing the Patient Centered Medical Home Model and the NCQA. Even though there was an additional layer of programmatic requirements placed upon the leadership and the clinic employees, the clinic safety program continued to demonstrate great achievements in safety, and showed high morale and communication, openness, inclusiveness, and respect for each other and their patients after the implementation of the VPP. Some might think the success of such an initiative might be dependent upon the leader who is in charge at the time. In the case of Illesheim, their success with both the tangible and intangible aspects of safety, mentioned above, was independent of one specific leader at the clinic, as the leadership was shared by three commanders during the course of the implementation phases.

Leadership was strong and supportive of the OSHA VPP implementation at the MEDCOM, BMEDDAC, and ultimately at the Illesheim Army Health Clinic. All three levels of the Army command structure fully supported and encouraged the clinic to succeed. Most all of the employees at the clinic knew they had the full support of the BMEDDAC and the MEDCOM to implement the VPP.

To fully understand how the employees felt about the commitment from leadership, the following quote is very telling:

> "VPP has made the clinic a better place to work as far as being safety conscious. It is not easy for everyone to make a change, but because the leadership buys into the product, and we do exactly the right thing, then they do not have a choice but to buy into the program. Not that we force them it is just automatically, because it is who this clinic is. The new commander did not know anything about VPP when he got here. But he was very, very supportive. I am sure he knew based on what the prior commander explained to him. That he had a knowledge of what it was, I do not think he did. Because I did not know either myself. Eventually after he was reading and being informed and all the meetings I had with him to keep him updated on what was going on, of course we learned the program together as well. It was hard. But now that's it. I am very blessed and lucky with what we have done in this clinic. Everybody here is so good to work with, very respectful, and they pretty much do things some times without even asking, because they know it is the right thing. Our leadership participates in everything the soldiers do. You will see myself, the commander, and the executive officer throwing salt outside, or shoveling snow, or doing police call and picking up cigarette butts." (See Appendix M)

Employees at the Illesheim clinic saw engaged leadership set the example for what right looked like. As a result, there was a real sense of Esprit de Corps among the

employees which was transferred to how they approached their work and how they cared for their colleagues and patients.

The unique element of the OSHA VPP safety management system upon which organizations are assessed and evaluated on is not only management and leadership commitment, but also employee involvement. The OSHA VPP states that employees must be actively involved in at least three meaningful ways in the organization's safety program. Employees at the clinic were actively involved with their commander in the weekly inspection of the clinic where many opportunities to improve the safety, health, and convenience of the employees and patients took place. Employees were involved in identifying and correcting safety hazards, safety recognition programs, teaching and training safety during their mandatory training days and the daily morning huddle.

Two quotes from employees that give a good insight into employee involvement at the clinic are below:

> "From when leadership had to come by to see it to get something done, to where staff members are identifying the hazards and want ownership of it, they want to have involvement with it." (See Appendix M)

> "The staff are very proud of receiving such an award. I believe that encouraged them to be more alert on safety issues and it is evident because they bring it up all the time. All the time. We do safety, we talk about safety issues at the end of the day on Fridays just for the active duty, we go around, hey, give a safety tip. Or even in the morning, I

> randomly throw in there, hey give me a safety tip for the clinic. Or if it is raining, people would say, make sure when you come in from the outside to the inside, either you wipe your feet off or you mop the entrance if it is wet, or you get someone to mop it. There is always something." (See Appendix K)

The results of the two Army ARAP safety climate surveys (a) corroborated the findings of the VPP annual evaluations regarding leadership commitment, employee involvement, and the participation of employees to report hazards; and (b) confirmed that VPP had a positive impact on employee morale and employees reporting and fixing hazards identified.

One of the documents reviewed was the results of the Army ARAP safety climate survey. The Army designed the ARAP survey as a tool to assess an organization's safety climate and culture. Unit commanders complete the ARAP survey during their assignment. The Army Safety Center provides a briefing to the unit commander on their survey results. ARAP is comprised of a 61-question online assessment, filled out anonymously by employees and soldiers that capture data on unit posture, command and control, standards of performance, accountability, and risk management. Items on the survey related to this study included (a) "morale and motivation in my unit are high," (b) "my unit maintains a positive command climate that promotes safe tactical and training operations," (c) "unit leadership is actively involved in the safety program and management of safety matters," and (d) "unit leadership willingly assists in giving advice concerning safety matters."

These four questions relate to the first VPP element titled management, leadership commitment and employee involvement. The morale and motivation question, as well as the positive command climate questions, are tied to the VPP element management, leadership commitment, and employee involvement. Employees must be involved in the safety and health management system in at least three meaningful and constructive ways. Employees can have input into safety and health decisions by participating in audits, accident/incident investigations, self-inspections, suggestion programs, planning, training, job hazard analyses, and appropriate safety and health committees and teams (OSHA, 2009). The questions on the ARAP survey; "unit leadership being actively involved in the safety program" and "willingness to give advice on safety matters" are also tied to the VPP element management, Leadership Commitment and Employee Involvement. This VPP element also specifies management will demonstrate its commitment by (a) establishing, documenting, and communicating to employees and contractors clear goals that are attainable and measurable, objectives that are relevant to workplace hazards and trends of injury and illness, and policies and procedures that indicate how to accomplish the objectives and meet the goals; and (b) setting an example by following the rules, wearing any required personal protective equipment, reporting hazards, reporting injuries and illnesses, and basically doing anything they expect employees to do (OSHA, 2009).

The researcher also examined three additional questions from the survey: (a) "unit leadership encourages reporting safety violations without the fear of negative leader feedback," (b) "individuals in my unit are willing to report safety violations, unsafe acts, or hazardous conditions," and (c) "I am not comfortable reporting a safety

violation, because people in my unit would react badly toward me."

These three questions are important because they relate to the second VPP element of worksite analysis. The questions on "unit leadership encourages reporting of safety violations without fear of negative leader feedback," "individuals willing to report safety violations and unsafe acts," and "not feeling comfortable reporting safety violations" were chosen because they are tied to an element in worksite analysis titled "hazard reporting system" for employees. This element states that participants must operate a reliable system that enables employees to notify appropriate management personnel in writing without fear of reprisal about conditions that appear hazardous, and to receive timely and appropriate responses. The system can be anonymous and must include timely responses to employees and tracking of hazard elimination or control to completion (OSHA, 2009).

The data for the ARAP survey completed before VPP implementation, reflected a total of nine amber flags and 52 green flags, meaning the clinic's mean score on the nine questions coded with amber flags was below or within one half standard deviation from the mean of the total Army. The results of the following nine ARAP survey questions were coded as yellow flags: (a) "my unit has a clear process to set training goals and to review performance," (b) "my unit has a defined process to effectively manage high-risk personnel," (c) "in my unit, violations of SOPS, regulations, or standards of conduct and discipline are rare," (d) "in this unit, anyone who regularly violates standards and rules will hurt his/her career," (e) "I have enough time to prepare for my missions," (f) "based upon my unit's personnel and other resources, the unit is stretched too thin," (g) "my unit has incorporated composite risk management in

decision-making at all levels of command," (h) "my unit does not hesitate to restrict individuals who are under high personal stress from participating in training or tactical operations," and (i) "the safety officer position is a desired job in my unit."

The results of the ARAP survey data after VPP implementation showed the clinic scored in the first quartile on all 61 questions, meaning that the mean score of the clinic was equal to or greater than the mean score of the entire Army on all 61 questions in the survey. The clinic demonstrated a great improvement in the results of their ARAP survey scores after the implementation of the VPP, increasing from 52 questions scored in the first quartile (83%) to 61 questions (100%).

The seven questions on the ARAP survey related to management, leadership commitment, employee involvement, and morale, where clinic personnel scored better than the rest of the Army before and after VPP implementation include (a) morale and motivation, (b) positive climate for safe training operations, (c) leadership involvement in safety program, (d) leadership willing to assist in safety, (e) leadership encourages reporting of safety violations, (f) employees willing to report safety violations and hazardous conditions, and (g) willingness to report a safety violation.

The results of the two ARAP surveys (a) corroborated the findings of the VPP annual evaluations regarding management, leadership commitment, employee involvement, and the participation of employees to report hazards; and (b) confirmed the clinic had a very good command safety climate and positive impact on employee morale and employees reporting and fixing hazards identified.

To gain a holistic perspective on the impact of management, leadership, and employee involvement on the clinic's implementation of the OSHA VPP, the researcher

reviewed four VPP annual evaluations to assess the outcomes of their injury rates. The annual evaluations showed the clinic's average 3-year TCIR and DART rates compared to their industry 3-year average for 2009-2011, 2010-2012, 2011-2013, and 2012-2014.

Illeshiem 2011 ANNUAL INJURY AND ILLNESS INCIDENCE RATES

Year	Work Hours	Total Cases	TCIR[1]	DART[2] Cases	DART Rate
2009	48,530	0	0.0	1	4.1
2010	48,012	1	4.2	1	4.2
2011	47,028	0	0.0	0	0.0
Totals	143,570	1		2	
Three Year Site Incidence Rate:			1.4		2.8
BLS Rate (NAICS - 621, 2009):			2.7		0.9
Percent Above/Below BLS Rate:			-48%		210%

Figure 14. FY11 accident and injury rates before VPP implementation.

Illeshiem 2012 ANNUAL INJURY AND ILLNESS INCIDENCE RATES

Year	Work Hours	Total Cases	TCIR[1]	DART[2] Cases	DART Rate
2010	48,530	1	4.1	1	4.1
2011	48,012	0	0.0	0	0.0
2012	46,872	0	0.0	0	0.0
Totals	143,414	1		1	
Three Year Site Incidence Rate:			1.4		1.4
BLS Rate (NAICS - 621, 2011):			2.7		0.9
Percent Above/Below BLS Rate:			-48%		55%

Figure 15. FY12 accident and injury rates before VPP implementation.

Illeshiem 2013 ANNUAL INJURY AND ILLNESS INCIDENCE RATES

Year	Work Hours	Total Cases	TCIR[1]	DART[2] Cases	DART Rate
2011	47,530	0	0.0	0	0.0
2012	46,872	0	0.0	0	0.0
2013	25,360	1	7.9	1	7.9
Totals	119,762	1		1	
Three Year Site Incidence Rate:			1.7		1.7
BLS Rate (NAICS - 621, 2012):			2.6		0.9
Percent Above/Below BLS Rate:			-36%		86%
Year to Date:	0	0	#DIV/0!	0	#DIV/0!

Figure 16. FY13 accident and injury rates before and after VPP implementation.

Illeshiem 2014 ANNUAL INJURY AND ILLNESS INCIDENCE RATES

Year	Work Hours	Total Cases	TCIR[1]	DART[2] Cases	DART Rate
2012	46,872	0	0.0	0	0.0
2013	25,360	1	7.9	1	7.9
2014	21,721	0	0.0	0	0.0
Totals	93,953	1		1	
Three Year Site Incidence Rate:			2.1		2.1
BLS Rate (NAICS - 621, 2013):			2.7		0.9
Percent Above/Below BLS Rate:			-21%		137%

Figure 17. FY14 accident and injury rates after VPP implementation.

Based on the Illesheim Army Health Clinic's average incident rates for the years 2009-2011, the rates were 48% below the industry standard TCIR rate and 210% above the industry standard DART rate. The clinic was 48% below the industry standard TCIR rate for 2010-2012, and 55% above the industry standard DART rate. They were 36% below the industry standard TCIR rate for 2011-2013, and 86% above the industry standard DART rate. Finally, the clinic was 21% below the industry standard TCIR rate for 2012-2014 and 137% above the industry standard DART rate.

The clinic's TCIR rates were below the industry average before and after VPP implementation. Their DART rates were higher than their industry average before and after VPP implementation. Because of the small size of the clinic, having only one mishap in a 3-year time period is enough to push the DART rate above the industry average, which was the case in all of the 3-year averages shown in figures 13-16. Although the clinic exceeded all of the 3-year industry averages for the DART rate, they were below the industry average for the TCIR rates in all of the 3-year averages shown above.

Although the clinic was above the industry average in the DART rates after VPP implementation, the clinic did achieve TCIR rates 36% and 21% below the national

average after the implementation of VPP. These results partially support the studies of Bunn, Slavova, and Tang (2011), who found a 24% decrease in illness and injury frequency and a 34% reduction in lost time case rate over 3 years. Bunn et al. found a 13% decrease in workers compensation cost per employee, but there was no conclusive evidence these outcomes were related to the implementation of the safety management system. Authenrieth et al. (2016) found significant differences between lower TCIR and DART rates and the Hazard Prevention and Control and the Management, Leadership and Employee Involvement components of safety management systems when using the OSHA on-site consultation services for safety management systems in the dairy industry. This study also supported the findings of Yoon et al. (2013), Hedlund (2013), Weems (1998), and King (2013). Yoon et al. (2013) which found construction companies that implemented the Korean OSHA 18001 decreased their accident rate of by 67% and their fatal accident rate by 10.3% over a 5-year period. Hedlund (2013) found that manufacturing companies who implemented the NOSA 5-Star system experienced fewer fatal and permanent disabling injuries than the national average. Weems (1998) found statistical evidence, although not conclusive, that companies which achieved OSHA VPP Star Status from 1983-1997 experienced an injury rate 63.5% lower than their industry counterparts who had not implemented the system. Finally, in a dissertation on the effectiveness of implementing the OSHA VPP in three pharmaceutical manufacturing companies, King (2013) found significant differences in the reduction of workplace injuries and accident and injury rates.

There were eight accidents and injuries reported by employees of the Illesheim clinic before VPP implementation and five after VPP implementation. These accidents

happened to soldiers, U.S. civilians, and local national employees. Only the accidents that happened to U.S. civilians are documented on the TCIR and DART rate charts above. Soldier and local national mishap data are not recorded on the OSHA TCIR and DART charts. The severity and the number of lost time days for the accidents were similar in the timeframe before and after VPP implementation.

The figure below shows the components of the General Systems Theory with an overlay of the findings of the study incorporating the results and themes from the interviews, document reviews, and observations of the meetings and physical environment of the clinic.

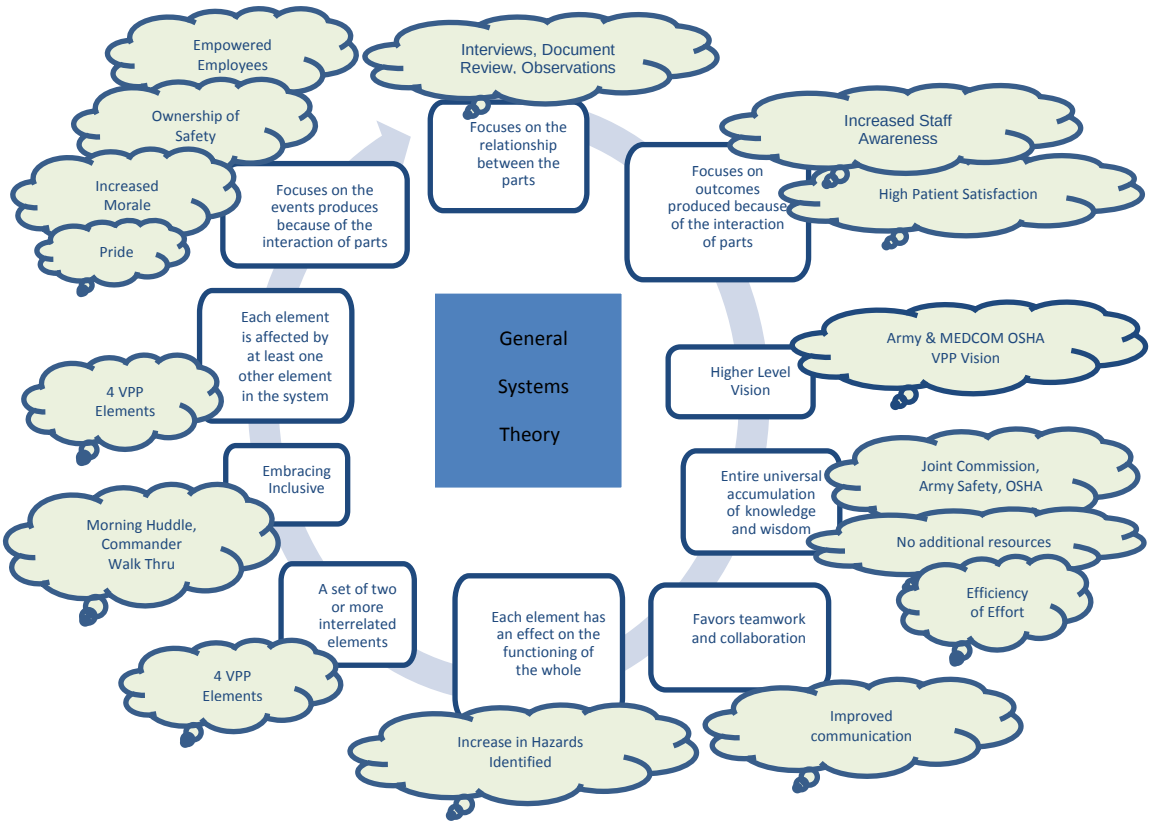


Figure 18. Overlay of General Systems Theory with safety outcomes.

Chapter 5: Discussion and Conclusion

Introduction

The purpose of this study was to determine the effect of the OSHA VPP and its impact on safety culture at the Illesheim Army Health Clinic. More specifically, the researcher addressed the following four research questions:

1. How does implementing the OSHA VPP safety management system affect employee and patient satisfaction?
2. How do employees feel about adding the OSHA VPP safety management system to their workload in addition to the hospital accreditation and the Army Safety Program?
3. What effect does the OSHA VPP have on staff morale?
4. How does implementing the OSHA VPP affect leadership commitment and employee involvement?

Data collection procedures included the use of open-ended interviews from 11 individuals from the following work groups: (a) U.S. civilian employees, (b) local national civilian employees, (c) soldiers, (d) supervisors, (e) the additional duty safety officer, (f) the full-time safety manager at the BMEDDAC headquarters, (g) the supervisor of the additional duty safety officer, (h) the supervisor of the full-time safety manager, and (i) those in leadership positions at the clinic (the commander, chief nurse, and medical director). The size of the clinic according to personnel rosters provided in July 2013 showed a total of 32 personnel.

In addition to open-ended interviews, the researcher reviewed the following documents: (a) Illesheim VPP annual evaluations for fiscal years 2011, 2012, and 2014;

(b) ARAP safety climate surveys; (c) patient satisfaction surveys; and (d) clinic safety inspections. For observation purposes, the researcher attended two meetings: (a) the BMEDDAC safety and environment of care council meeting, and (b) the Illesheim Army Health Clinic morning huddle. The researcher also conducted a routine walk through observation of the physical environment of the clinic.

Discussion of the Findings

Five major themes emerged from the data sources. The five themes were: (a) leadership commitment and employee involvement; (b) morale, pride, and communication; (c) concern for patient and employee safety; (d) patient satisfaction; and (e) staff awareness regarding safety. The findings of this study support much of the research reported in the literature review. Below is a discussion of the findings of this study as they relate to the literature.

Leadership commitment and employee involvement. One of the four elements of the OSHA VPP model is management, leadership commitment and employee involvement, perhaps one of the most important and sets the tone for success or failure. This element of the VPP is not contained in the Army Safety Management System Model which means that it is not evaluated or assessed during periodic inspections. The VPP model depends upon a shared leadership approach that distributes ownership, and responsibilities for guiding, supervising, and managing safety among the employees. The success of this element depends on leadership supporting all tenants of the OSHA VPP not only as defined in written documents, but known, felt, and seen by everyone in the organization through active, engaged leadership.

As part of the OSHA VPP, employees are expected to participate in the safety program in at least three visible and meaningful ways. Examples found in the document review and the interviews included many examples of leadership commitment and employee involvement. First, the commander initiated a hazard reporting recognition program where employees were rewarded in front of their peers for reporting unsafe and hazardous conditions in the clinic. In addition, the commander led the daily morning huddles where employees volunteered safety tips, safety lessons learned, or a review of mishaps that occurred or could occur in the clinic. Next, the commander participated in safety inspections with employees and helped identify unsafe conditions that needed corrected. Finally, employees were involved in identifying and correcting hazards, conducting monthly safety inspections and risk assessments, and reporting near-miss incidents. In this way, safety became everyone's duty and responsibility, and employees made it their jobs to identify and fix conditions that could lead to accidents and injuries to patients and staff members. Employees became empowered.

An employee at the clinic spoke of leadership and said they led by example and participated in everything the soldiers did. They mentioned it as a domino effect: if people see the leader doing something, they will do it on their own. Lead by example, do the right thing, and soldiers will follow. The clinic commander showed his commitment to the occupational health and safety management system by including it as a topic in his daily huddle with all clinic employees.

Leadership involvement was evident at the Illesheim clinic in 2009, when the clinic commander first volunteered to participate in the OSHA VPP. Since that time, the clinic had two new commanders who both supported this initiative, which meant that

the safety culture of the clinic was not solely dependent on one particular leader, but a leader that was fully supportive and engaged in safety. Senior leader commanders at the BMEDDAC, ERMC, and the MEDCOM all provided support for the OSHA VPP. As a clear example of leadership support for this initiative, the BMEDDAC commander initiated an incentive for organizations to receive one dollar per month additional funding for every patient enrolled in the facility for those organizations that achieved the OSHA VPP.

The results of this study showed that leadership commitment and employee involvement were one of the main reoccurring themes supporting the positive safety culture of the clinic. These results support the findings of Quinlan and Mayhew (2000) and the critical role of senior leader commitment. The results also showed the importance of communication and employee involvement as key factors in successful health and safety management (Cohen et al., 1975; Smith et al., 1978). Finally, Walters (2003) found evidence that safety management systems were effective for increasing employee participation on two levels.

These examples of leadership commitment and involvement support the research of Mohammadfam et al. (2016). In this study, the researchers showed that the most influential factors, based on relative weight in improving the effectiveness of the OSHAS 18001, were management commitment, worker participation, communication, and dissemination of health and safety results and activities to employees. Quinlan and Mayhew (2000), Cohen et al. (1975), Smith et al. (1978), Aksorn and Hadikusumo (2008), and Fernandez-Muniz et al. (2007) all supported the critical role of senior

leader, commitment, communication, and employee involvement in the success of implementing a safety management system.

Finally, Gallagher (2000) measured the effectiveness of different types of occupational health and safety management systems that resulted in a potential relationship between highly developed occupational health and safety management systems and better safety and health performance. Expert consultations performed in conjunction with this study endorsed this possibility only when these conditions were met: (a) occupational health and safety systems customized to the organization with stakeholder input; (b) senior leader commitment, proper resources, and accountability; (c) all organizational functions integrated into the safety management system; and (d) employee participation.

Morale, pride, and communication. Clinic personnel knew their clinic was the first in the entire MEDCOM to achieve the OSHA VPP. Also, they knew their patient satisfaction scores were the best in the region, which made them the recipients of praise and recognition from the Army Surgeon General and the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health Office for being the first to achieve the OSHA VPP in the MEDCOM. In the interviews, staff and leadership expressed confidence and pride in their accomplishments to improve the quality and safety of patient care.

The importance communication played in the relationships between leadership, employees, and supervisors played a key role especially in the identification of hazards in the clinic. Employees expressed the high level of communication they had with each other with these statements:

"Because people are more aware of their surroundings, hazards are found during the command and executive officer inspections and are documented in writing." (See Appendix I)

"People are more prone to seek out a hazard or report a hazard. Now there is a standard, we do this. I believe the new people coming on board are the same way we address concerns in the morning huddle. (See Appendix I)
People are not waiting until someone gets hurt to fix the issue. They are proactive when they see something. They bring it up to you, or they fix it themselves. Before, we had a lot of, oh, yes, we should have fixed that. Now, staff notoriously are great to fix whatever the issue is, or they ensure leadership is made aware of it." (See Appendix I)

Concern for patient and employee safety. The attention to safety was proactive and the positive safety climate was visible when speaking to employees and observing the clinic environment. There was a unique and genuine concern for the safety and well-being of the staff and patients in the clinic. Employees said that things were completely different, it was a changed perspective, a culture was established, and they could see the difference. Employees took care of employees and also took care of patients. Everyone looked out for one another. Examples of proactive safety initiatives included providing salt on the patient parking lot, improving the mats at the clinic entrance and under the workstation chairs of the providers, and enclosing the walkway between the two

buildings. Employees spoke about looking out for employee and patient safety. One staff member described it like this:

> "I think there is a lot of pride that goes into it. You change the mentality of the organization where they actually are working to protect fellow staff members and your patients in our facility. The greatest thing is getting the mentality to change when you go through the VPP Star Strong Program that actually is the payoff. It is not just getting the flag that is important, it is actually changing the mentality of the unit." (See Appendix M)

Patient satisfaction. More than half of the employees interviewed said that implementing the OSHA VPP had a positive impact on their patients. Employees stated that they always found a way to satisfy their customers, not ever saying "no" to a patient. One employee explained:

> "I think customer satisfaction, customer service is the non-safety related outcome. Because of the culture established and the fact that all staff have bought into the new culture and are an active part of it. It has transformed the way and the dynamic in which we take care of patients and how we treat patients in a positive way. Illesheim is one of our top scoring clinics in terms of patient satisfaction. It is due to how we do business in relation to the VPP concepts." (See Appendix B)

The employees said that implementing VPP transformed the way and the dynamic on how patients were cared for in a positive way. Minimizing accidents and injuries to staff led to an increased availability of providers which was positive for the patient and provided them better access to care. The clinic was the top performing clinic within the region for patient satisfaction. There were initiatives for improving the efficiency of patient care at the clinic with the Patient Center Medical Home Model and the NCQA. The implementation of these two programs at the same time as the OSHA VPP could have had an impact on the increase in patient satisfaction.

Staff awareness regarding safety. The employees at the Illesheim clinic strongly agreed there was a high level of communication of safety information from the leadership to the employees beginning every day at the morning huddle. The researcher observed the morning huddle at the clinic and it was obvious that the communication of safety information was relayed to everyone, initiated from the leadership and employees themselves. Bottani et al. (2009) and Mohammadfam et al. (2016) found significant differences in companies that implemented safety management systems in relation to communication and dissemination of information, and defining safety goals and communication to employees.

As stated earlier, leadership and employees at the clinic conducted periodic safety walks through the clinic to identify unsafe conditions that needed corrected. Employees proactively brought safety hazards to the attention of the commander, fixed unsafe conditions on their own, took initiative, and seemed to be extremely safety conscious. Employees reported instances of patient and employee near-misses in order to prevent accidents and injuries from occurring.

Employees at the clinic proactively identified hazardous conditions, the rugs at the clinic entrance that were folded, the mats underneath the office chairs, and the snow in the patient parking lot. They initiated identifying and fixing safety hazards on their own, which supported the conclusions of Bottani et al (2009) and Mohammadfdam et al. (2016) that there are significant differences in the identification of risk, corrective actions, and risk assessment in companies that implemented safety management systems.

The five major themes which emerged from the analysis of the data sources: (a) leadership commitment and employee involvement; (b) morale, pride, and communication; (c) concern for patient and employee safety; (d) patient satisfaction; and (e) staff awareness regarding safety showed there were positive impacts on the safety culture at the clinic after the implementation of the OSHA VPP. Employees gave the following examples of their confidence, enthusiasm, and positive morale at the Illesheim clinic: (a) top performer in patient satisfaction scores throughout the BMEDDAC command, (b) first clinic in the MEDCOM to achieve OSHA VPP Star Strong certification, (c) first clinic in Europe to achieve NCQA certification, (d) piloted the safety management system and became a resource and example for everyone in the MEDCOM, (e) led to implementation throughout the Army Medical Command, and (f) received recognition from Army Medical Command and Department of the Army. These results support the conclusions of Mohammadfam et al. (2016) and Bottani et al. (2009) that companies who have implemented occupational health and safety management systems have a higher performance in safety than those who have not.

Conclusion

The results of this study highlighted the positive safety culture of the Illesheim Army Health Clinic as a result of implementing the OSHA VPP safety management system. There was something unique and special about the employees at this clinic. As an observer, the researcher could see and feel the intangible feelings and the mood of those who worked at the clinic. One could feel the inspiration of the employee's morale, the openness of the communication, their deep sense of satisfaction from their achievements, and their delight and fulfillment in completing a worthwhile endeavor. The employees felt a vibrant sense of empowerment and a self-confidence that their voice mattered and would make a difference. All of these intangible behaviors and feelings of the employees were possible because of the strong emphasis of the clinic on the OSHA VPP element of management, leadership, and employee involvement.

The results of the data showed there were positive things that happened related to leadership commitment and employee involvement: (1) morale was high, (2) pride in their accomplishments was visible, (3) communication was open, (4) concern for patient and employee safety was foremost on their mind, (5) patient satisfaction was high, and (6) staff safety awareness was a priority. The VPP element of management, leadership, and employee involvement played a significant role and impact in the clinic's positive safety culture.

An important conclusion is that even though there was an additional layer of programmatic responsibility placed on the organization, employees felt there were no additional resources necessary to implement the OSHA VPP as opposed to the Joint Commission and the Army Safety Program. There was some evidence that employees

devoted more time to mandatory training as a result of implementing the OSHA VPP. Overall, employees felt there was no additional burden in terms of personnel and resources needed to implement the VPP, implying the synergistic effect of adhering to the Joint Commission and Army Safety Program standards.

This study is significant because there is not a great deal of evidence in published, peer-reviewed literature on the effectiveness of occupational safety and health management systems to make recommendations either in favor of or against their use. There are also not very many qualitative studies on the effectiveness of safety management systems, in particular, the OSHA VPP in Army organizations.

The findings of this study are important to policymakers at Department of the Army and the MEDCOM to determine and understand how implementing VPP or other systems-based approaches can make an effect on the reduction of accidents, injuries, the costs of medical workers' compensation, and the safety culture of an organization.

Policymakers at the MEDCOM can gain a better picture of the costs in terms of personnel and resources and return on investment for implementing VPP in coordination with the Joint Commission accreditation program and the Army Safety Program. Policymakers at the Army level can use the findings of this study to drive decisions on future implementation mandates in light of reductions in manpower and fiscal resources.

Currently, Army organizations follow the prescribed rules and program elements contained in AR 385-10, dominated by checklists of prescribed mandates. Nowhere in the Army Safety Program or in the Army Safety Management System Model does it mandate or evaluate for management, leadership, and employee involvement, which

was a critical key component to the success of the safety culture at the Illesheim Army Health Clinic. The Army Safety Program has historically been based on the effectiveness of adherence to prescriptive program elements, a compliance based programmatic approach, and not a safety systems management approach such as the OSHA VPP.

Researching public and private organizations to determine if there is a positive or negative effect when implementing occupational safety and health management systems is critical to changing the paradigm of moving from a compliance based programmatic approach, to a performance based systems approach. Because the Army is in the beginning stages of executing occupational safety and health management systems, studies of this nature provide insight to employees, leadership, third party coalition partners, unions, and customers on whether or not there is value and return on investment for implementing this new approach. The Army and the MEDCOM are in the midst of understanding and accepting this paradigm shift and going in a new direction instead of staying with the ways things have always been done, only adhering to the regulatory elements contained in the Army safety program regulation.

This study showed there were positive effects on safety culture as a result of implementing the OSHA VPP, an occupational safety and health management system at an Army health clinic. Clinic employees felt VPP had a positive impact on leadership commitment and employee involvement, morale, pride, communication, concern for patient and employee safety, patient satisfaction, and staff safety awareness.

The academic significance of this study to is to provide a foundation for industry, healthcare, and the military for a health and safety management system

approach implemented at an overseas Army clinic. This approach has influenced and shaped new doctrine and reality into a transformational model for the MEDCOM, the Army, and the DoD. Scholars in occupational safety and health management systems can review empirical evidence on VPP implementation in an Army health clinic overseas and be able to understand the feelings and emotions from the employee's perspective of the outcomes of VPP implementation. Illesheim clinic and BMEDDAC employees benefit from providing information to policymakers at the Army and MEDCOM to improve future policy mandates that will impact Army organizations world-wide.

Building on Existing Research

The researcher found one critical theoretical reflection of the Dutch military expeditionary organization and the usefulness of a safety management systems theory. Moorkamp et al. (2014) applying the safety management systems theory might lead to either a safety management system that constantly lags behind, diminishes the ability of the Dutch defense organization to deal with the complexity of its environment, and does not improve their ability reduce uncertainty safely or successfully. These authors argued that safety management systems theory is better suited for organizations that are more stable and encounter minimal variance.

Recommendations for Future Research

Future researchers should conduct more studies within other MEDCOM organizations to include larger sized Army hospitals and clinics to examine the effectiveness and return on investment after implementing the occupational health and safety management system in the United States and overseas. Such studies should

include identifying the facilitators and barriers to implementing occupational safety and health management systems in these facilities. The use of comparison groups and longitudinal designs to enhance the generalizability and practical application of follow-up research would be of great benefit.

References

Ackoff, R. L. (1981). *Creating the corporate future*. New York, NY: John Wiley & Sons.

Aksorn, T., & Hadikusumo, B. H. W. (2008). Critical success factors influencing safety program performance in Thai construction projects. *Safety Science,* 46, 709-727.

Army Provider Level Satisfaction Survey (APLSS) Survey Results. (2010). Retrieved from https://amedd.altarum.org/aplss/

Army Provider Level Satisfaction Survey (APLSS) Survey Results. (2012). Retrieved from https://amedd.altarum.org/aplss/

Army Readiness Assessment Program (ARAP) Survey Results (2011). Retrieved from https://arap.safety.army.mil/

Army Readiness Assessment Program (ARAP) Survey Results (2013). Retrieved from https://arap.safety.army.mil/

Army Regulation 40-2. (1978). *Army medical treatment facilities general administration.* Washington, D.C.: Department of the Army (DASG-HCP).

Autenrieth C., , et al. (2016). The associations between occupational health and safety management system programming level and prior injury and illness rates in the U.S. dairy industry. *Safety Science, 84,* 108-116.

Bianchini, A., Donini, F., Pellegrini, M., & Saccani, C. (2017). *An innovative methodology for measuring the effective implementation of an Occupational Health and Safety Management System in the European Union* (Original research article, University of Bologna, Italy).

Blom, C. (1997). *Complexiteit en contingentie* [Complexity and contingency]. Kampen: Kok Agora

Bogdanov, A. (1922). *Tektologiya: Vseobschaya Organizatsionnaya Nauka*, Berlin and Petrograd-Moscow.

Bogdanov, A. (1980). *Essays in Tektology: The general science of organization*, trans. G. Gorelik. Intersystems Publications.

Bottani, E., Monica, L., & Vignali, G. (2009). Safety management systems: Performance differences between adopters and non-adopters. *Safety Science,* 47, 155-162.

Bullock, A., & Stallybrass, O. (Eds.) (1977). *The fontana dictionary of modern thought*. London, UK: Fontana/Collins.

Bunn, T. L., Slavova, S., & Tanag, M. (2011). Injuries among solid waste collectors in the private versus public sectors. *Waste Management and Research, 29*(10), 1043-52.

Casey, Jr., G. W., & McHugh, J. M. (2010). *Army safety and occupational health strategic plan*. Washington, D.C.: Office of the Assistant Secretary of the Army.

Checkland, P. (1997). *Systems thinking, systems practice*. New York, NY: Wiley.

Checkland, P. (1981). *Systems thinking, systems practice*. New York, NY: Wiley.

Chemical Industries Association. (1995). *Responsible care management systems for health, safety and environment* (2nd ed.). London, UK: Author.

Cohen, A., Smith, B., & Cohen, A. (1975). *Safety program practices in high vs low accident rate companies: An interim report.* Cincinnati, OH: National Institute of Occupational Safety and Health.

Deming, W. E. (1986). *Out of the crisis.* Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study.

Department of the Army. (2013). *Safety: The army safety program*. Washington, D.C.: Author.

Eisner, H. S., & Leger, J. P. (1988). The international safety rating system in South African Mining. *Journal of Occupational Accidents, 10*(2), 141-60.

Fernández-Muñiz, B., Montes-Peón, J. M., & Vázquez-Ordás, C. J. (2009). Relation between occupational safety management and firm performance. *Safety Science, 47*(7), 980-991.

Flood, R. L. (1990). Liberating Systems Theory: Toward critical systems theory. *Human Relations, 43*(1), 49-75.

Flood, R. L., & Jackson, M. C. (Eds.) (1991). *Critical systems thinking: Directed readings.* Chichester, UK: Wiley.

Frick, K., Jensen, P.L., Quinlan, M., Wilthagen, T. (Eds.), (2000). *Systematic occupational health and safety management: Perspectives on an international development.* Oxford, UK: Pergamon Elsevier Science.

Frick, K. (2006). EU's legal standard on risk assessment. In W. Karwoski (Ed). *Handbook of Standards and Guidelines in Ergonomics and Human Factors.* Mahwah, NJ: Lawrence Erlbaum Associates.

Gallagher, C. (1997). Health and safety management systems: *An analysis of system types and effectiveness*. Melbourne, Australia: National Key Centre in Industrial Relations.

Gallagher, C. (2000). *Occupational health and safety management systems: System types and effectiveness*. Melbourne, Australia: Deakin University.

Gallagher, C., Underhill, E., & Rimmer, M. (2001). *Review of the effectiveness of occupational health and safety management systems in securing health and safe workplaces.* Sydney, Australia: Sydney National Occupational Health and Safety Commission.

Gallagher, C., & Rimmer, M. (2003). Occupational safety and health management systems in Australia: Barriers to success. *Policy and Practice in Health and Safety, 1*(2), 67-81.

Gatti, M., Biferali, D., & Volpe, L. (2009). Il Governo dell'Impresa tra profitto e creazione di valore. *Sinergie, 79,* 145-171.

Guba, E. G., & Lincoln, Y. S. (1981). Effective evaluation. San Francisco, CA: Jossey-Bass.

Gunningham, N., & Johnstone, R. (2000). The legal construction of occupational health and safety *management systems.* In In K. Frick, P. L. Jensen, M. Quinlan, & T. Wilthagen (Eds.), *Systematic occupational health and safety management: Perspectives on an international development* (pp. 125-46). Amsterdam, Netherlands: Pergamon.

Goswami, S., & Chakrabarti, A. (2012). Quartile clustering: A quartile based technique for generating meaningful clusters. *Journal of Computing, 4*(2), 48-55.

Haas, E. J., & Yorio, P. (2016). Exploring the state of health and safety management performance measurement in mining organizations. *Safety Science, 83, 48-58.*

Health and Safety Executive. (1997). *Successful health and safety management*. Sudbury, ON: Health and Safety Executive.

Hedlund, F. H. (2014). The relationship between the implementation of voluntary Five-Star occupational health and safety management system and the incidence of fatal and permanently disabling injury. *Safety Science, 63,* 94-103.

Heinrich, H. W. (1931). *Industrial accident prevention* (2nd ed.). New York, NY: McGraw-Hill.

HQ, USA MEDDAC, Bavaria. (2010). *Joint Commission Environment of Care Tracer Tour*. Unit 28028, CMR 411, APO AE 09112.

HQ, USA MEDDAC Bavaria. (2010). *Combined Subsequent Command Inspection and Joint Commission Environment of Care Tracer Report, 2nd Qtr, CY10*. Unit 28038, CMR 411, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2011). *Joint Commission Environment of Care Tracer Tour, III/2011*. Unit 28028, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2011). *Joint Commission Environment of Care Tracer Tour, IV/2011*. Unit 28028, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2012). *Joint Commission Environment of Care Tracer Tour, IV/2012*. Unit 28028, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2010). *Safety and Environment of Care Staff Assistance Visit*. Unit 28038, CMR 411, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2011). *Safety and Environment of Care Staff Assistance Visit*. Unit 28038, CMR 411, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2012). *Safety and Environment of Care Staff Assistance Visit*. Unit 28038, CMR 411, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2013). *Safety and Environment of Care Staff Assistance Visit*. Unit 28038, CMR 411, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2010). *Illesheim Health Clinic VPP Annual Evaluation.* Unit 28028, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2013). *Illesheim Health Clinic VPP Annual Evaluation.* Unit 28028, APO AE 09112.

HQ, USA MEDDAC, Bavaria. (2015). *Illesheim Health Clinic VPP Annual Evaluation.* Unit 28028, APO AE 09112.

International Labor Organization (ILO). (2001). *Guidelines on occupational safety and health management systems*. Geneva, Switzerland: International Labour Office.

Jackson, M. (2003). *Systems thinking: Creative holism for managers*. Chichester, UK: John Wiley & Sons.

King, R. D. (2013). *Effectiveness of OSHA VPP Safety interventions to reduce injury and illness rates within the pharmaceutical industry* (Dissertation, Capella University). UMI Number: 3567578.

Laszlo, A. (1996). *The systems view of the world: A holistic vision for our time.* New York, NY: Hampton Press.

Laszlo, A., & Krippner, S. (1998). Systems theories: Their origins, foundations, and development. In J. S. Jordan (Ed), *System Theories and A Priori Aspects of Perception* (pp. 47-74). Amsterdam, Netherlands: Elsevier Science.

Lewchuk, W., Robb, A. L., & Walters, V. (1996). The effectiveness of Bill 70 and joint health and safety committees in reducing injuries in the workplace: The case of Ontario. *Canadian Public Policy*, *22*(3), 225-243.

Macy, J. (1991). *Mutual causality in Buddhism and general system theory.* Albany, NY: SUNY Press.

Meadows, D. H. (2008). *Thinking in systems: A primer*. White River Junction, VT: Chelsea Green.

Mele, C., Pels, J., & Polese, F. (2010) A brief review of systems theories and their managerial applications. *Service Science*, *2*(1/2), 126–135.

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* San Francisco, CA: Jossey-Bass.

Mohammadfam, I., Kamalinia, M., Momeni, M., Golmohammadi, R., Hamidi, Y., Soltanian, A. (2016). Developing an integrated decision making approach to assess and promote the effectiveness of occupational health and safety management systems. *Journal of Cleaner Production, 127,* 119-133.

Mohammadfam, I., Kamalinia, M., Momeni, M., Golmohammadi, R., Hamidi, Y., Soltanian, A. (2016). Evaluation of the quality of occupational health and safety management systems based on key performance indicators in certified organizations. *Safety and Health at Work,* 1-6. Moorkamp, M., Kramer, E. H., Van Gulijk, C., & Ale, B. (2014). Safety management theory and the expeditionary organization: A critical theoretical reflection. *Safety Science, 69,* 71–81.

National Safety Council (NSC). (2014). *Basics of occupational safety and health.* Retrieved from http://www.nsc.org/NSC%20Picture%20Library/Publications/176450000_Basics_FM.pdf

Nielsen, K. (2000). Organization theories implicit in various approaches to occupational health and safety management. In K. Frick, P. L. Jensen, M. Quinlan, & T. Wilthagen (Eds.), *Systematic occupational health and safety management: Perspectives on an international development* (pp. 99-124). Amsterdam, Netherlands: Pergamon.

OSHA Strategic Partnership (OSP). (2009). *2009 Annual evaluation executive summary.* Retrieved from http://www.osha.gov/dcsp/partnerships/national/army_684/2009_summary.html

OSHA Instruction. (2008). *Voluntary Protection Programs (VPP): Policies and Procedures Manual.* Retrieved from https://www.osha.gov/OshDoc/Directive_pdf/CSP_03-01-003.pdf

Philliber, S. G., Schwab, M. R., & Samloss, G. (1980). *Social research: Guides to a decision-making process*. Itasca, IL: Peacock.

Quinlan M., & Mayhew, C. (2000). Precarious employment, work re-organization and the fracturing of OSH management. In K. Frick et al. (Eds), *Systematic OHS management: Perspectives on an international development* (pp. 175-198). Oxford, UK: Elsevier.

Robson, L., Clarke, J., Cullen, K., Bielecky, A., Severin, C., Bigelow, P.,… & Mahood, Q. (2005). *The effectiveness of occupational health and safety management systems: A systematic review.* Toronto, Canada: Institute for Work and Health.

Saksvik, P. O., & Nytro, K. (1996). Implementation of internal control of health, environment and safety in Norwegian enterprises. *Safety Science, 23*(1), 53-61.

Smith, M., Cohen, H., Cohen, A., & Cleveland, R. (1978). Characteristics of successful safety programs. *Journal of Safety Research*, *10*(1), 5-15.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Tehranian, M. (1974). *Towards a systemic theory of national development.* Tehran, Iran: IMI Press.

Tortorella, M. J. (1995). *The three careers of W. Edwards Deming.* Retrieved from http://www.wyohistory.org/encyclopedia/w-edwards-deming

Ulrich, W. (1983). *Critical heuristics of social planning: A new approach to practical philosophy.* Bern, Switzerland: Haupt.

Vogel, L. (1994). *Prevention at the workplace: An initial review of how the 1989 community framework directive is being implemented.* Brussels, Belgium: European Trade Union Technical Bureau for Health and Safety.

Von Bertalanffy, L. (1968). *General system theory: Foundations, development, applications.* New York, NY: George Braziller.

Walters, D. (Ed.). (2002). *Regulating health and safety management in the European Union: A study of the dynamics of change.* Brussels, Belgium: P.I.E. Peter Lang.

Walters, D. (2003). *Workplace arrangements for OHS for the 21st century*. Paper presented to Australian OHS Regulation for the 21st Century Conference, Gold Coast, Queensland.

Weems, L. D. (1998). *The effect of participation in the occupational safety and health administration's voluntary protection programs on injury and illness rates.* (Doctoral dissertation, Louisiana State University and Agricultural and Mechanical College). UMI Number: 9922125.

Weinberg, G. M. (2001). *An introduction to general systems thinking.* New York, NY: Dorset House.

Yassi. A. (1998). Utilizing data systems to develop and monitor occupational health programs in a large Canadian hospital. *Methods of Information in Medicine*. *37*(2), 125-129.Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.

Yoon, S. J., Lin, H. K., Chen, G., Yi, S., Choi, J., & Rui, Z. (2013). Effect of Occupational Health and Safety Management System on work-related accident rate and differences of occupational health and safety management system awareness between managers in South Korea's construction industry. *Safety and Health at Work*, *4*, 201-209.

Zwetsloot, G. I. J. M. (2000). Developments and debates on OHSM system standardization and certification. In K. Frick, P. L. Jensen, M. Quilan, & T. Wilthagen (Eds.), *Systematic occupational health and safety management: Perspectives on an international development* (pp. 391-412). New York, NY: Oxford University Press.

Appendix A: Results of Interview Questions

The table below represents the interview questions that required either a yes or no answer. The table is presented to reflect a simple number count of all answers from those interviewed to give an overview to see if there was any recurrent theme or pattern. It allows the reader to get a sense of the data as a whole, independent of researcher judgment or bias. Providing this number count helps to ensure there is no bias in interpreting the data and the data is presented in a factual context.

Table A1

Number Count of Results of Yes/No Interview Questions

Interview Question	**Number Count (N=11) Answer =Yes**	**Number Count (N=11) Answer =No**	**Number Count (N=11) Answer= Don't Know**	**Number Count (N=11) N/A**	**Number Count (N=11) Did not Answer**	**Number Count (N=11) Yes, Initially, But Not Now**
Do you believe implementation of VPP had any positive outcomes for the clinic in terms not related to safety, for example, customer satisfaction?	6	2	1		2	
Do you believe you (and all clinic personnel) had to devote more time to conduct mandatory training because of VPP?	3	5	1			2

Has the amount of time you spend completing mandatory training during the duty day stayed the same after clinic received VPP?	9			2		
If you are a provider, has the RVU workload (productivity) increased after the clinic received VPP?	1	3	1	6		
Do you feel there is any additional burden in terms of resources (personnel and time) needed to implement/sustain VPP as opposed to implementing the Army Safety Program or the Joint Commission EOC Program?	3	7				1
Do you believe implementation of VPP had any positive outcomes for the clinic in terms of safety outcomes or safety performance?	9	1	1			
Have the number of accidents and injuries reported by employees of the clinic increased after the		8	3			

clinic received VPP?						
Have the number of safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours decreased after the clinic received VPP?	3	2	5			1
Have the number of hazards found and reported by employees of the clinic increased after the clinic received VPP?	5	3	3			

Appendix B: Results of Interview Question 1

The first interview question, "How does implementing the OSHA VPP safety management system effect employee and patient satisfaction? Six answered yes, there were positive outcomes related to customer satisfaction, two answered no, there were no positive outcomes related to customer satisfaction, one did not know, and two did not answer the question.

Table B1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. I believe the implementation of VPP had positive outcomes for the clinic, in terms of employee and patient satisfaction.	6	Salt on the sidewalks in the winter time. Mats at entrances and exits to the clinic. Experiencing clearly definable increases in APLLS scores. Not saying "no" to their customers. Always finding an answer or a way to satisfy the patient. Clean and safe appearance of the clinic. Created better access to care for the patients. Patients are able to see the same provider to ensure continuity of care. Handicapped access and a newly constructed enclosure from the clinic to the administrative

		portion of the clinic to provide shelter from bad weather and to enhance and facilitate handicapped travel throughout the clinic. Impression of better healthcare. Higher level of staff awareness and a further mitigating accident and injury related losses led to an increase of availability and time of staff and providers to perform safe, patient care. One of BMEDDAC's top performing clinics for patient satisfaction. Achieved a patient satisfaction level of 100% for five months straight. The only clinic in the region to achieve this recognition. Established a safety culture that everyone has bought into and are actively involved in. Transformed the way and the dynamic in which they take care of patients in a positive way.
NO. I believe the implementation of VPP had positive outcomes for the clinic, in terms of employee and patient satisfaction.	2	Don't know of anyone who came to the clinic who said, hey, I really noticed that you removed those rugs, per say.

		I believe it put our clinic out front, gave kudos to the command, clinic, and employees that helped do the right thing.
DON'T KNOW.	1	
DID NOT ANSWER.	2	

Those interviewed who felt there was a positive outcome for their patients and customers because of the implementation of the VPP gave the following examples:

> "VPP did have a positive outcome in terms of the military soldiers who would lay salt on the sidewalks during the winter time. Other units on post do not take these steps. We do this every year. We had to treat a patient that had a fall in another facility here on post, which did not take the safety measures that we do. Our soldiers clean the floors when there is rainy weather outside. The satisfaction comes in when we don't have people being injured in the clinic, or staff members getting injured and their access to care stays the same. It is one of those things people don't realize until it is not there."

> "It absolutely had an impact on customer satisfaction. Customer satisfaction comes a long way. If we harp on customer satisfaction, it becomes apparent. I have seen it here, through our command culture with our previous commander, it was very patient centric. The culture he

created here reminded me of being a manager of a restaurant before I joined the Army. We approached them with a positive attitude and a smile on our face. If we cannot do something for a patient, we will find an answer for them. It is never just leave it at a negative response and move on. I believe the culture our previous commander created really added to customer care and satisfaction without a doubt."

"In keeping with the OSHA VPP and making sure the environment was kept to a certain level, I think that increased our patient satisfaction. Our monthly APPLS scores show as far as the cleanliness of the clinic and the way we are insistent on it, is up in the upper 90 percentile. It the patients see a place that looks like it is clean and safe, then they are more likely to say they are getting better healthcare. If it looks like a clinic, then they feel like it is a clinic. If it looks like a Battalion Aids Station, then they feel like they are getting garage medicine."

"Keep in mind, the Illesheim clinic was always, historically a high scoring clinic. Illesheim typically scored high on patient centered, in the APPLS customer satisfaction survey Still, I think the implementation of the VPP did help further to improve it. Also, it did improve, I think, because of a higher level of staff awareness, and further mitigation of accident or incident related losses which resulted in the increased availability of providers and staff to perform safe patient care."

“I think customer satisfaction, customer service is the non-safety related outcome. Because of the culture established and the fact that all staff have bought into the new culture and are an active part of it. It has transformed the way and the dynamic in which they take care of patients and how they treat patients in a positive way. Illesheim is one of our top scoring clinic in terms of patient satisfaction. It is due to how they do business in relation to the VPP concepts.”

“Possibly with the access to care. People do like to see the same provider so as far as the continuity of care, I think people do really like that. I do know our patient satisfaction level was at 100% for five months straight. We were the only clinic in Bavaria that had that. And it stays well above the standard, I believe we are 92% for this month.”

“Our customer satisfaction is very high within the BMEDDAC, we are one of the best. We are at 92% - 94% which is one of the best with the BMEDDAC. We just have a cautious effort which is done right from the front desk, to the medics, to the providers, the same thing in terms of safety shoes in the laboratory, in the pharmacy, we have thought about patients having a tough time going over to the TRICARE, going through snow and ice to pick up their referral. I think that will automatically come back in our APPLS scores and the patients are going to be pleased.”

Appendix C: Results of Interview Question 2

The second interview question was "What effect does implementing the OSHA VPP safety management system have on the employees' current training requirements?" Three individuals answered yes, they had to devote more time to conduct mandatory training because of VPP, five said no, they did not have to devote more time to conduct mandatory training because of VPP, one did not know, and two said that yes, there was more time devoted to training initially, but not now.

Table C1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. We have had to devote more time to conduct mandatory training due to VPP.	3	We had to devote more time to training. We are always doing training, so if it was not that training, we would have done some other training. We had to spend more time at several levels of the command structure. Especially to the new hires, who have no background in VPP. The additional time invested starts with newcomers orientation, continues at morning huddles, and continues with additional training requirements during defined training times.
NO. We have not had to devote more time to conduct mandatory training due to VPP.	5	Mandatory training is consistent with the Army.

		We were going to have some sort of mandatory training anyhow. We just made the time for it. We managed the time we were given efficiently, rather than adding to our training time. No, not after the initial push for VPP. Now we just need to make sure that as new personnel come in, they understand what the climate is here for safety. Now it is like an update or refresher training. It is also encouraged to be brought up at the daily huddles.
DON'T KNOW	1	
Initially yes, but not now.	2	

Those interviewed and responded that no, employees did not have to devote more time to conduct mandatory training due to VPP, provided the following examples:

> "After the initial implementation, it is now more like an update or a refresher training every three months, and then again on a daily basis during the morning huddle. Here, it is encouraged that people bring up safety issues, and if you were to ask these folks, they will tell you one by one, these were some of the issues that were brought up, the last one was about soldiers who do their physical training on the runway in the back

and how we have to watch out for them, especially on days where it is dark or foggy."

"I don't think it required any additional training after the initial push for OSHA VPP. At the beginning, I understand a lot went into it. Ever since we received it, it has been about equal. There was a lot involved in getting the certification, it was just maintaining and making sure that as new personnel come in, understanding what the climate is here for safety within the clinic. Yes, we continue to have VPP training, continuously, we bring it up in the morning briefs and we bring it up in our Friday training."

"Because VPP was a new concept, we had to promote it more and I had to put more effort into it. Remember, Joint Commission, OSHA VPP, and the National Certification for Quality Analysis (NCQA) all happened at the same time. So those days will show that you had longer training on those Friday afternoons. You will not see more than four hours of training at any given time. The NCQA gave us the certification and accreditation for the Patient Centered Medical Home (PCMH). We got this certification in 2013. It is the highest you can get for PCMH – Level 3. We are the first clinic in the BMEDDAC to achieve this."

Appendix D: Results of Interview Question 3

Interview question three was, “Has the amount of time you spend completing mandatory training during the duty day stayed the same after clinic received VPP?” resulted in nine individuals who said yes, the amount of time spent completing mandatory training during the duty day did stay the same after the clinic received VPP, and two individuals that said this question was not applicable to them.

Table D1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. The amount of time we spend completing mandatory training during the duty day stayed the same.	9	Initially, there was a lot of push, as the program was coming on and we were getting all the requirements done for everything. It seemed like a lot. A year’s worth of training crammed into a short amount of time. Now, it just falls onto our training calendar. All sections of the clinic conduct four hours of training every week. They are supposed to. Our mandatory training is done on Friday afternoons. The clinic closes patient care supposedly, but we will not turn down a patient either because people do not get sick on a time schedule. There has been no increase or any extra time.

		It did not get any more or less. The same amount of time is allotted. The only thing I know has changed is that we actually do more training in that same allotted time frame than we used to.
N/A	2	

Appendix E: Results of Interview Question 4

The fourth interview question, "How do employees feel about adding the OSHA VPP safety management system to their workload in addition to the hospital accreditation and the Army Safety Program?" resulted in three individuals who said yes, they felt there is an additional burden in terms of resources (personnel and time) needed to implement/sustain the VPP as opposed to the Army Safety Program or the Joint Commission Environment of Care program, seven said no, they felt there was no additional burden in terms of resources (personnel and time) needed to implement/sustain the VPP as opposed to the Army Safety Program or the Joint Commission Environment of Care program, and one that said yes, initially, but not now.

Table E1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. I do believe there is an additional burden in terms of resources (personnel and time) needed to implement/sustain VPP as opposed to implementing the Army Safety Program or the Joint Commission Environment of Care program.	3	There was a significant amount of time involved for those who were the champions and running with the ball. All three programs require time, unfortunately, away from patient care. The Army Safety Program and the JC Program reflect on the minimum requirements. VPP, on the contrary, wants to establish programs that exceed minimum requirements.

NO. I do not believe there is an additional burden in terms of resources (personnel and time) needed to implement/sustain VPP as opposed to implementing the Army Safety Program or the Joint Commission Environment of Care program.	7	If you are efficient in operation, you can achieve this. It is a part of what should be done already. We are just concentrating on something that has already been here, perhaps approaching it in a different manner and taking a new quantitative value to it. You do not need any additional personnel. If you have an Executive Officer and a Chief Nurse and the people that need to be in the clinic, they can do it. If your JC books are straight, you will be good for VPP. All requirements nest and support each other. There are no new requirements for VPP that are no already part of the Army Safety Program or the JC Program. The JC is the one that requires more time. The VPP is more common sense things we need to do. The only extra resource might be the training part.
Initially yes, but not now.	1	

Individuals who responded they did believe there is an additional burden in terms of resources (personnel and time) needed to implement/sustain VPP as opposed to

implementing the Army Safety Program of the Joint Commission Environment of Care program, articulated the following comments:

> "There was a significant amount of time that was involved with the individuals who were the champions and pretty much running with the ball. Once it was developed and implemented, then maintaining it is far easier. The initial push was a significant investment of time on everybody's part. Now that it running, I do not see that it takes anything away. Now that the practices are being used, then they just become a way of doing business. For the Army, we use the term battle rhythm, it is just the way we do our normal business."

> "Once we got the flag and our recognition, we still followed that protocol. It has always been strong on day one, it is strong now, and I believe it was strong before VPP too. Again, I do not know how much we changed. I always felt we were doing the right thing for the last three or four years. It just seemed like we honed that and we gave it a name. So, it was really not traumatic, it was kind of easy for us to do. And because we are going to this Patient Centered Medical Home hub system, we can look at them in the morning and say, we will do this, oh, my lab is not working today, I don't have these chemicals, or that may be a safety issue."

Appendix F: Results of Interview Question 5

The fifth research question asked to individuals at the Illesheim clinic was "What impact does implementing the OSHA VPP safety management system have on increasing/achieving positive outcomes and safety performance?" Nine out of eleven respondents said yes, the implementation of VPP did have positive outcomes for the clinic in terms of safety outcomes and safety performance. One said no, and one replied they did not know one way or the other because they have been doing the same things in the clinic, which is doing the right thing, always.

The table below shows short excerpts from the individuals interviewed and their answers for the question number #5, "What impact does implementing the OSHA VPP safety management system have on increasing/achieving positive outcomes and safety performance?"

Table F1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. I believe implementation of VPP had a positive outcome(s) for the clinic in terms of safety outcomes or safety performance?	9	VPP elements are common sense things. Caused more awareness. Reminded us there is a standard. People here want to look out for their fellow staff member and patients. Unlike anywhere else. Proactive approach to safety.

		A culture has been established here-you can see the difference. This is completely different, this is like a changed perspective.
NO. I do not believe implementation of VPP had any positive outcome(s) for the clinic in terms of safety outcomes or safety performance?	1	The clinic is always staying pretty safe. There is no difference from when we first began.
DON'T KNOW	1	The clinic has always done the same things, which is doing the right thing, always.

The following quotes highlight specific impressions from those interviewed on the positive safety outcomes or safety performance at the clinic:

> "A lot of the VPP elements were common sense things. Because of the program, it brought these things to light to be reviewed and set a standard for standard operating procedures to be developed and timelines for them to be refreshed. VPP kept safety and everything in the forefront of people's minds."

> "I believe the implementation caused more awareness, for employees to be aware of safety and how serious of an issue it is. What is brought to light, was different statistical data throughout the MEDCOM and civilian

care, in such that, how many patients and employees are truly at risk in their own environments, especially from a laboratory perspective, how infectious diseases can be, and if we are not safe or following proper protocol, then we can become at risk in our own profession. I believe VPP and OSHA added or enlightened employees throughout my tenure here."

"Definitely, it has. Since we started implementing the OSHA VPP, the staff have been very, very good at responding in a positive way. Whenever they bring the carpets here, and they are not folded straight, the staff takes it upon themselves to either notify somebody or they actually remove it and place it somewhere else where there is no traffic. And they let somebody know, hey, I took this out because it was not folded flat completely and someone could have had a fall. Also, when it rains, the staff takes it upon themselves to mop the entrance of any spills or wet floors as you come in from the outside. They also move carpets in a different location to put a focus mostly on the entrance to prevent people from falling. Anything that is broken, they report it, or they put something in to stop anybody from going through it and they inform the supervisors. They work very well, everybody here."

"I think the benefit was that we were continuing to use that type of model. It assured us to continue to use that, it reminded us that there is a

standard. That type of behavior is always a good thing. If there is a guideline that tells us how to do something safe, then there is no question on how to do it safely. Those carpets, myself personally, I have tripped. I don't know if it was because of the VPP or it just happened at the same time, when we got those types of carpets, they were new carpets. They became a safety hazard. And I believe we replaced those, either because of the VPP or just common sense. They were not cheap. So I think we either lost a lot of money, or maybe if we were not doing the VPP, because of that cost, we could have said, just suck it up and use those carpets and don't trip."

"From my opinion at a clinic, and after having served twenty six years in the Army, typically, safety is something that is kind of driven and you are forced to do it. Whereas here, everybody actually wants to look out for their fellow staff members and for the patients all the time. Every single staff member at one time or another has brought something to me, whether it was an issue or something that needs to be fixed, and I have never seen that before. Typically, everybody tries to ignore it and if the floor is wet, everybody will walk by and close their eyes if that floor is wet. Whereas I have seen every single staff member at one time or another drying floors out. I have seen them doing multiple little issues for the patients and for the staff which I have never seen that anywhere else."

“The implementation of the VPP fostered the reporting of near miss situations, while obtaining near-misses that enabled the clinic and us to more proactively approach safety related situations. It fostered and supported a safer work environment at the clinic. I think automatically, patient safety did improve as a general outcome.”

“Initially, yes. In comparison to Illesheim and other clinics, the first impression when you first walk into the Illesheim clinic, is where you first see the difference. What I mean by that, is in terms of the culture that has been established there. You go to the front desk, and they ask you to sign in. Then they provide you with a very brief orientation in terms of being there in the clinic, so they would say where the emergency exits were and what those types of safety considerations are as a visitor. They do this for all of their visitors. That is not commonly seen across the board at other clinics. I think that is actually our only clinic that is doing that. That is actually that culture piece that has been established.”

“I am not saying that it is positive or negative, because I do not know how it was before the program and how the result was afterwards. I have no examples. Hopefully, yes. I think so.”

“It has had a huge impact. In the past, this was never a topic for us, in the sense that we were just following the previous BMEDDAC, Wuerzburg, clinic that was coming down here, how do you do your winter safety driving, what do you do for example, accidents during the summer, summer safety. There were only a few trainings that we would get within a year. But then, this is completely different. This is like a changed perspective. This is every day now. This is how we take care of our folks within the clinic how we take care of ourselves. Like I told you early on, the commander said something about the big accident where we had a fatality and he said that everybody has to focus, you need to look out for the way you drive to work, how you can make sure that your car is inspected, you need to look at the road conditions, this is pretty much ingrained in our way of thinking, this is very different, this was not there before. Everyone in the clinic is now participating. The last example I can give you is the mats in front of the doors. There were no mats. So people would come in with wet shoes and snow, you would see people slip and slide, I don’t know if there were any major accidents involved. This was a hazardous condition. This is something dangerous, something bad can happen. And guess what, finally, we got money from BMEDDAC. You get leadership involved. In front of all these doors now you see these mats. The mats we had earlier on, there was a problem with them, when the sides were rolled out, carpet had a fold in them from when they were rolled out, and people would trip over them. And then

people would say these are not the best. You want another example? When the clinic was refurbished part of the initial contract, they said to me, your chair is supposed to have a plastic mat underneath. So I was given a plastic mat for underneath my chair. Patients are walking away, and I am moving my chair to this side, to that side, after some time, that plastic mat was torn in the center and on the edges and as part of the roll up, it became a dangerous thing for me, right, and then it became a dangerous thing even for a couple of the providers, because everybody had them underneath their chairs, in this time if you were to see how we were reset, one provider was here, one chief nurse here, and then you have another medic, imagine there are three different mats, and all these mats are sort of like the bubbles in the middle or the edges torn, if you would walk through, you would trip. So the first thing that was done was, talk to the folks, tell them it was a safety issue, a safety hazard, and all these were taken out in the entire clinic."

Appendix G: Results of Interview Question 6

The sixth interview question, “Have the number of accidents and injuries reported by employees of the Illesheim clinic increased after the clinic received VPP” resulted in eight individuals who said no, accidents and injuries reported by employees of the clinic did not increase after the clinic received VPP, and three said they did not know.

Table G1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
NO. The number of accident and injuries reported by employees of the Illesheim clinic did not increase after the clinic received VPP.	8	
DON’T KNOW.	3	Don’t think we had any injuries here. If we did, we would find out about it in our daily huddles. Anything important that has happened is communicated to us in the morning huddle. I do not feel that in this work environment, I have seen or heard any increase in dangerous occurrences of any kind.

According to the Illesheim Additional Duty Safety Officer, the clinic has not had any recordable accidents in the last five years. One individual interviewed who said

that no, the number of accident and injuries reported by employees of the Illesheim clinic did not increase after the clinic received VPP, gave the following comment:

> "I think that is the big thing that OSHA VPP did, it actually has people taking an honest look around all the time about what the safety environment is constantly here, and who is the safety officer. So everybody is concerned about safety at all times."

Appendix H: Results of Interview Question 7

The seventh question, "Have the number of safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours decreased after the clinic received VPP" resulted in three individuals who said yes, safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours did decrease, two said no, safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours did not decrease after the clinic received VPP, five said they did not know, and one said yes, initially, but not now.

Table H1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. The number of safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours decreased after the clinic received VPP.	3	For the JC tracer tour prior to the last one, there were no findings of significance. I would say almost down to zero findings. During the JC survey in June 2013, there were no findings. The surveyors were here for four hours and they could not find anything.
NO. The number of safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours did not decrease after the clinic received VPP.	2	Without looking at the data, I could guess it increased, because when you take a ship that is function great, you can only assume there has to be something wrong somewhere there, because nothing is perfect. Or, you are looking at the points

		of inspection more closely. What did happen though, is the level and type of findings identified have completely changed. The level of hazards being found by safety professionals are lesser in number, but greater in severity. The clinic is self- identifying and correcting minor safety hazards.
DON'T KNOW.	5	We had someone who was very big with pushing safety initiatives and recognizing hazards. Having someone who is a champion for safety and recognizing hazards, when that attitude catches on, then it really pushes a mentality of safety that goes throughout. We have the buy in for safety from staff and leadership at this clinic. I would be informed about any violations during our morning huddle. All employees in the clinic attend the morning huddles, five days a week. The results and findings are more for the command group or the safety officer here that finds that out.
YES, Initially, but not now.	1	

Those interviewed who answered no, the number of safety violations written up during BMEDDAC/clinic safety inspections or Joint Commission tracer tours did not decrease after the clinic received VPP, provided the following clarifying remarks:

> "The level of hazard being found are greater hazards, they carry a larger potential for severe outcome. They are lesser in number, but greater in severity. The clinic is self-identifying and correcting the minor, day to day safety hazards. Basically, the outcome, what this program enables us to do on the other side, is that it enable the BMEDDAC safety staff to defer their attention away from the little things, obvious safety violations, and to proactively address potential underlying trends and tendencies, or issues that carry severe outcomes. For example, instead of identifying ergonomic workplace design issues, the BMEDDAC safety staff is able to identify more serious issues such as a lack of medical gas purity checks."

Appendix I: Results of Research Question 8

The eighth interview question "Have the number of hazards found and reported by employees of the Illesheim clinic increased after the clinic received VPP?" resulted in five individuals who answered yes, the number of hazards found and reported by employees of the clinic did increase after the clinic received VPP, three individuals who answered no, the number of hazards found and reported by employees of the clinic did not increase after the clinic received VPP, and three individuals who answered they did not know.

Table I1

Short Excerpts from Respondents

Answer and Question	Count	Short Excerpts
YES. The number of hazards found and reported by employees of the Illesheim clinic has increased after the clinic received VPP.	5	Because people are more aware of their surroundings. Hazards are found during the command and the executive officer inspections and are documented in the environment of care binder. People are more prone to seek out a hazard or report a hazard. Because of this, and doing the right thing. Now there is a standard, we do this. I do believe the new people coming on board, are the same way. We address concerns in the morning huddle. We discuss those things. It is part of the standard of every day.

		People are not waiting until someone gets hurt to fix the issue. They are proactive when they see something. They bring it up to you, or they fix it themselves. Before, we had a lot of, oh, yes, we probably should have fixed that. Now, staff members notoriously are great to fix whatever the issue is, or if they cannot fix it immediately, they make sure that the command group is made aware of it, if it is an issue. What we see, is that the clinic is on a permanent upward glide path. This means that from visit to visit, improvements related to safety are recognizable and staff shows a pride to communicate their engagement to address and abate safety related matters. It is being brought up more consciously now. It is being brought up a whole lot more frequently now. During the past, this was not really a topic. But now, this is really on a weekly basis, on a daily basis.
NO. The number of hazards found and reported by employees of the Illesheim clinic has not increased after the clinic received VPP.	3	We were going towards the earning of the status and it was I the forefront of everyone's mind. Individuals were practicing, "well they said that, if I see a hazard,

		verbalize it, so now I am verbalizing it, look, people are taking action now, it is up left up to me to do something about it." During the process of implementing VPP, the biggest hazards were identified then. The near misses related to patient safety does not always get reported to all employees. Most of the time, we always get something that has happened, we are told about it in the morning huddle. The near misses, I don't think so. Because all the things discovered along the way were fixed. The staff really stays on top of things. Their preparedness makes it so that their reporting does not have to happen.
DON'T KNOW.	3	This clinic typically has low numbers of hazards. I don't receive the reports. I don't know when some other employee reports something to their supervisor. I am not involved, so I don't hear about it.

Appendix J: Results of Research Question 9

The table below represents short excerpts from the ninth interview question "What does VPP and Army Star strong status mean to you?"

Table J1

Short Excerpts from Respondents

Interview Question	Count	Short Excerpts
What does VPP and Army Star strong status mean to you?	11	A sign of pride for us. VPP just takes it all to a different scale. A mind change. This was not there before. It just flows very beautiful.
		Voluntary protection program. Volunteered to set ourselves to a higher standard of safety than what is required. We want to put our staff and our patients to the higher standard of safety. Identified as one of the first in the entire military. Set the standard for what safety should be in any facility in the Army.
		Culture of safety. Building a culture of safety that is more a part of your business. Integral part - not just a check the block.
		Good solid safety program.
		Safety for everybody.
		1st clinic to lead the pack in many things to include the VPP status.

		We were able to do it in 17 months of implementation. Bragging rights. Emphasis on safety. Developing controls for issues before they become problems. Identifying risk and hazard and putting controls into it. Everyone can have a voice to say something.
		Long term projected program. Protecting our own staff. We focus a lot on patient safety, but we did not focus so much on us. Tool to give guidance. Sense of accomplishment. Conscious about the safety of our staff. Good reward for the hard work that the Soldiers and staff have done. Produced a good number of safety conscious individuals,
		Additional safety training. Additional safety concentration. Hefty reminder of safety. Competition. Exceeding expectations.
		Standard of safety.

		Nothing really. Not anything special. Safety program. Don't really care about it.
		Great example of what a healthcare facility should be and look like. A level of professionalism and caring from our staff.

The following quotes highlight specific impressions from those interviewed on the question, "What does VPP and Army Star strong status mean to you?"

> "I think it is a sign of pride for us. I wish they could have come up with something like this even before. It was just a constant little phase where we said ok, this side is patient safety, there is a thing called environment of care and safety. Which our safety manager has come in and talked to us about: chaining the photographs, chairs in the corridors, and fire hazards. And now there is VPP, it just takes it all to a different scale. Oh yes, there is snow and ice out there, and how is this person with crutches who has now been screened, going to go all the way down to the administrative building and pick up a referral? This is a mind change now. This was not there before. In those days, I will have someone come pick you up and your paperwork, and I will run over and see a different patient. And now it just flows very beautiful."

"OSHA VPP is basically a voluntary protection program. It is designed that we have volunteered to set ourselves to a higher standard of safety than what is required. We have actually decided that we want to put our staff and our patients to the higher standard of safety that we can. The last two commanders before me, they actually did a great job. We were identified as one of the first in the entire military. We set the standard for what safety should be in any facility, medical or any other type of facility within the Army."

"Establishing a culture of safety. Before, there were a lot of safety requirements (checking the block). Now, VPP is building a culture of safety that is more a part of your business. More of an integral part - not just a check the block."

"A good solid safety program where staff injuries are mitigated to the furthest extent possible."

"Safety for everybody. Nothing much. I am here to do my job and train."

"Essentially means I work at Illesheim and that Illesheim was the 1st clinic to have led the pack in many things to include the VPP status. We were able to do it in 17 months of implementation. Everyone in the AMEDD arsenal knows what we did and the things we achieved so we

have bragging rights. VPP means to me, it means there is an emphasis on safety. It means looking at and developing controls for issues before they become problems. Identifying the risk and hazard and putting controls into it. Everyone can have a voice to say something."

"It means a way of giving you a long term projected program. It is a tool that gives our staff and leadership a means of protecting our own staff. We focus a lot on patient safety, but we did not focus so much on us. I think that we are as important as the patients. Without us, the patients do not have any care. The patients cannot go anywhere else for care. So that is what OSHA VPP is a tool that gives us the guidance. And also the opportunity to make corrections to fix what a lot of people would not think is a safety hazard, like those mats being folded on the tip or in the middle or the patients or staff getting trapped and then we fall, thus affecting manpower. Army Star Strong Status means to me, it is a sense of accomplishment, saying that we are conscious about the safety of our staff. It is a good reward for the hard work that the Soldiers and staff have done. But I think it is more that we have made or produced a good number of safety conscious individuals, because you can talk to any of our staff, and they will tell you what they will do if they see something that they think is hazardous."

"I want to say, additional safety training, additional safety concentration. A hefty reminder of safety. I am not going to lie, another word that comes to mind is competition. Our clinic was very close obviously to receiving these statuses and first time go on all these different things and our command was excited about that so it became somewhat of a competitive nature to get things done. Now, did we sacrifice safety in pursuit of that competition? No, I don't see that happening, I mean, we are a small operation. I think it helped us more than anything. I had no experience with VPP before, only with CAP. I did lots of CAP. Army Star Strong means we are in compliance with Army standards as well. There is the blanket data that they expect us to meet, and we are above that status. We are exceeding the expectations. I can only assume."

"It is a standard of safety. Bottom line, again I will go off on a tangent. I have worked in third world countries. And there is no standard. You would be appalled. If a person has never seen what a standard is not, you do not know what the standard should be. So it could be so appalling, which is not normal for those people. They think that is a normal safety environment and it is nowhere near what we have. So my belief is that any implementation of safety is the right thing. So, it can't hurt us. A society or firm that does that it is the correct thing to do."

"Personally to me? Nothing really. I mean it is good to have safety and inform the employees or the patients of safety. Make sure that everybody

is safe. The program itself is not anything special. It is a safety program. I would not know the difference between the two, which one is better? I don't really care about it. I mean I care about safety but I mean about the program per say. I don't know I mean. I don't know what to say. Because I can't really say that a decline from before accidents related, employee accidents too, or hazardous work conditions. Was there really a difference before the VPP program or after? I was not really involved in it."

"That would have been much better to ask me a couple of months ago, when it was clearer in my head. My understanding of what it means, is that we are a great example of what a healthcare facility should be and look like. They should be clean, they should be safe. There should be a higher level of professionalism and caring from our staff. I know everyone was very excited when we got it."

Appendix K: Results of Interview Question 10

The table below represents short excerpts from the tenth interview question, "Do you know what positive outcomes have happened at the Illesheim clinic as a result of achieving Army Strong Status?"

Table K1

Short Excerpts from Respondents

Interview Question	Count	Short Excerpts
Do you know what positive outcomes have happened at the Illesheim clinic as a result of achieving Army Strong Status?	11	Our core understanding. How we think. With every employee. How we can improve. It is every aspect of our work here, literally.
		Pride Being the first clinic to accomplish it. More than a building block. Allowed us to continue on to enhance other areas. NCQA came much easier for us to get. There is nothing we cannot accomplish.
		Positive accolades. First to achieve it within ERMC and the MEDCOM. Resource for MEDCOM and the garrison on how to do it and what it can do for organizations.

		Standard for the rest of the clinics within the BMEDDAC.
		Positive outcomes more visible to the staff at the Illesheim clinic. No direct outcomes. Fancy certificate. Mentioned in the Army Times. Recognition.
		Giving everyone a VOICE. Everyone understands their responsibility in safety. Their voice is important. What they feel and what they see is important for leadership to get involved. Their voice is recognized. Encourages people to say something.
		Staff are very proud of receiving such an award. Encourages staff to be more alert on safety issues.
		A sense of pride. Culture - we are one of the best clinics in the Army. Improved the culture. Proud. No perks or bonuses. Other restrictions take away from the culture. Warm fuzzy feeling of success.

		Trying to fit a round peg into a square hole does not work. Civilian/private practice mentality towards medicine in the Army. Socialized medicine. Taking a socialized system and trying to fit it with a privatized model. Proud of receiving these statuses is only one drop in the bucket, or only one component. Top clinic in the Army. Best clinic in the Army. Surgeon General visit to the clinic.
		Fame. Recognition. Always good.
		First clinic to receive the star. Prestige? We did it before everybody else.
		Patient satisfaction. Clinic is great shining example of what it should be. Patients are happy.

The following quotes highlight specific impressions from those interviewed on the question, “Do you know what positive outcomes have happened at the Illesheim clinic as a result of achieving Army Strong Status?”

“We have to say first of all, this is our core understanding now. This is how we are working in the clinic, this is how we think. This is pretty much with every employee right now. And it not just about what your employee is thinking. You have to in terms of your patients also and the entire force, how we can improve. And it is every aspect of our work here, literally.”

“I think it gives the clinic and themselves, not just from a safety position, from the patients and staff members from being safer, there is a certain amount of pride that comes in from being the first clinic or organization to accomplish it. Being the first one in our organization, it has really been more than a building block that has allowed us to continue on to enhance other areas. Once they got that, then I think the NCQA came much easier for us to get, because again, they realized that, before it was or it felt like, a bridge too far to get to, and now they feel like, we accomplished this, there is nothing we cannot accomplish. We have been very fortunate, I have a great staff that really gives a 110% to whatever they do.”

“They received positive accolades because they were the first to achieve it within ERMC and the MEDCOM. They became a resource for MEDCOM and the garrison on how to do it and what it can do for

organizations. The Illesheim clinic became the standard for the rest of the clinics within the BMEDDAC."

"Positive outcomes are probably more visible to the staff at the Illesheim clinic. We have not seen any direct outcomes actually. Now, related to this question, keep in mind, that the accident and injury rate at the Illesheim clinic, already, prior to the MS2/VPP was very low, that would have been one of the direct outcomes that we would have seen. Their accident and injury rate was historically low prior to MS2/VPP, low meaning lower than the national industry rate."

"We got a fancy certificate. I know that the clinic was mentioned in the Army Times so the clinic has got a lot of recognition for it."

"Giving everyone a VOICE. And pushing that everyone understands their responsibility in safety. If an employee sees something they believe is a hazard, that they do have a voice to say something and it is not going to be upsetting or retaliation. It is looked at now, is it an actual hazard? What kind of controls do we need to take for it? Sometimes, the mindset of safety is that everyone feels safe. So if they feel it is a hazard maybe we should look at it because they do feel that it is a hazard and that is always going to be in their mind. They do need to realize their voice is important and to what they feel and what they see is important for

leadership to get involved with as well. And then as individuals, to see that their voice is recognized, it definitely encourages people to say something."

"The staff are very proud of receiving such an award. I believe that encouraged them to be more alert on safety issues and it is evident because they bring it all the time. All the time. We do safety, we talk about safety issues at the end of the day on Fridays just for the active duty, we go around, hey, give a safety tip. Or even in the morning, I randomly throw in there, hey give me a safety tip for the clinic. Or if it is raining, people would say, make sure when you come in from the outside to the inside, either you wipe your feet off or you mop the entrance if it is wet, or you get someone to mop it. There is always something."

"A sense of pride in the culture that we are constantly reminded that we are one of the best clinics in the Army. It definitely improved the culture as far as our work goes. We have come to believe that we are the best clinic in the Army. If the Surgeon General takes time to come down to visit the clinic that is saying something, that really does. In May or June of 2012 she stopped at our clinic to visit and talk with us. She spent a few hours here at our clinic. That is a lot for the Surgeon General to spend at a small clinic."

“I think personally it put the clinic in a position for fame or recognition. That is always good. The other thing is, people now have come to us, saying hey, how do you do this? What did you guys do? And it was easy, we did this, that and the other. I guess that has caused other people, either because it’s easier to figure out, if the wheel is not broke, don’t fix it. Just find that person who is doing it right, and we will implement what you are doing. I think that is a smart thing. I have heard that that has happened.”

“We were the first clinic to receive the star, it is like, what do you call it, prestige? We can say that we did it before everybody else.”

“That is a tough question. From my perspective, the most positive outcome, is our patient satisfaction. The patients like to come here, they like the care they get. Very rarely do we get any negative feedback of any kind. The clinic really is that great shining example of what is should be. But then I haven’t seen a big change in that since I came. It has been that way since I started working here. We always have the ebb and flow, but overall, the patients are happy and that is what matters.”

Appendix L: Results of Research Question 11

The table below represents short excerpts from interview question eleven, "Do you know what important milestone was achieved within the U.S. Army Medical Command when the Illesheim Army Health Clinic achieved Army Star Strong status?"

Table L1

Short Excerpts from Respondents

Interview Question	Count	Short Excerpts
Do you know what important milestone was achieved within the U.S. Army Medical Command when the Illesheim Army Health Clinic achieved Army Star Strong status?	11	I have no idea. Were we the first one? Probably. First within the MEDCOM. He gave us the flag. No, we did not know we were the first.
		First to receive the Army Star Strong within the MEDCOM.
		First unit within the U.S. Army MEDCOM to achieve this status. Achievable.
		MEDCOM chose not to tell us. No idea. Recognition from other DoD agencies. Safety program that by far exceeds products to be found in other entities. Prove the positive outcomes of the MS2 program. Can be implemented in medical entities within MEDCOM.

		First clinic to get it.
		Culture of safety.
		Surgeon General pleased. People in DC mentioned it. Now mandatory for everyone. First clinic in the MEDCOM to achieve this recognition.
		First clinic to achieve Army Star Strong Status in the MEDCOM.
		First clinic within the AMEDD, MEDCOM to achieve that.
		First one to start the program in MEDCOM. First clinic to receive it in MEDCOM.
		Don't understand what you mean. Proud we got it. Example for what they wanted the other clinics to strive to become. Example for all Army medicine.

The following quotes highlight specific impressions from those interviewed on the question, "Do you know what important milestone was achieved within the U.S. Army Medical Command when the Illesheim Army Health Clinic achieved Army Star Strong status?"

“I have no idea. Were we the first one? Probably. You were the first within the MEDCOM. Looking back, I remember the time when you came down, and there was someone from the Department of the Army. Right, he gave us the flag. That was great, that was very beautiful. Yes, I remember that. We did not know that there was not any more clinics within the BMEDDAC or ERMC, no, we did not know that we were the first. We were the first.”

“Like I said earlier, we were the first to receive the Army Star Strong within the MEDCOM.”

“Yes, the Ilesheim clinic was the first unit within the U.S. Army MEDCOM to achieve this status. This recognition showed that it was achievable.”

“MEDCOM chose not to tell us. We know what was quoted at our level, to implement this program. But we had no idea what the importance at MEDCOM level resulted in that situation. I assume it was the recognition from other DoD agencies to set a safety program that by far exceeds on a daily basis safety products to be found in other entities. Like I said, we have never received official feedback from MEDCOM, what the Illeshiem Health Clinic success meant to MEDCOM. So I can only assume that this success story at Illesheim did prove the positive

outcomes of the MS2 program that this program can be implemented in medical entities within MEDCOM."

"As far as I know, the Surgeon General was very pleased when she came here to see the clinic, she had mentioned in several of her meetings with other people in the MEDCOM, we heard this through MAJ Myers, he said there are people in DC that I know that have mentioned it, she would like other clinics to be like us, in every aspect, as far as PCMH and VPP. Now that she has made it mandatory for everyone. Yes, I know that we were the first clinic in the MEDCOM to achieve this recognition. Italy was the second clinic to achieve this status. They said they are first to none, but they were the second clinic to achieve it, after Illesheim."

"I don't understand what you mean. I really don't. I know that they were all very proud that we got it. I think they could point us out as the example for what they wanted the other clinics to strive to become. I think that is what they used us for. But I don't know if that was their big outcome. I do remember hearing something along the lines of we were the example for all Army medicine. And that might have been what their bright shining moment with that was."

Appendix M: Results of Research Question 12

The table below represents short excerpts from the twelfth interview question, "Is there anything else you think we should know about the outcomes and effects of being an Army Star Strong site?"

Table M1

Short Excerpts from Respondents

Interview Question	Count	Short Excerpts
Is there anything else you think we should know about the outcomes and effects of being an Army Star Strong site?	11	Patients see the difference. Patients can participate.
		Pride goes into it. Change the mentality of the organization. Actually are working to protect fellow staff members and your clients or your patients in our facility. There is a lot of pride. Greatest thing is getting the mentality to change - that actually is the payoff. Changing the mentality of the unit.
		This is what right should look like.
		Definitely beneficial to ANY type of entity. Improves staff safety tremendously and as a result patient safety. Comes with cost.

		Including Stage 1, there is not much additional time and resources needed. Biggest challenge in Stage 1, was not having a certified safety and industrial hygiene staff assigned to clinic. Stage 2 on, beneficial to the clinic that documents and reports required are generated, trended, and evaluated to closure by the clinic personnel. Much better if clinic has its own clinic specific products that define clinic needs, necessities, and challenges. A change from the past on how the MEDCOM is assessing clinics. Clinic needs to be proficient to show and communicate clinic specific abatement actions. In reference to the “effects” of being an Army Star Strong” site, is the pride within the organization. Implementation of the VPP does not come cheap. That there is additional work that needs to be done.
		Without command emphasis, it has potential to peter out. Illesheim did a first - kudos. From when leadership had to come by to see it, to get something done with it, to where staff members are identifying the hazards and they want ownership of it; they want to have involvement with it.

		Not easy for everyone to make a change. Leadership buys into the product, they do not have a choice but to buy into the program. Everybody here is so good to work with, very respectful, and they pretty much do things sometimes without even asking, because they know it if the right thing. We treat our staff with respect. Our leadership participates in everything that the Soldiers do. That is why it works, we set the standard, we go out there, and we lead by example, and not from the back. Lead by example and everything is a domino effect. The Soldiers will do it on their own. Lead by example, do the right thing, and Soldiers will follow.
		It becomes top heavy, headquarters does. Creates jobs. Job security for headquarters. These additional safety protocols, are something we are already doing. We are tripling or quadrupling it over and over. My HAZMAT room is inspected by four different groups, asking the exact same questions. Overlapping. VPP is just another book to read, just another binder on the desk, another system to operate.

		Always positive. It must be positive when you are doing the right thing and not causing harm or preventing catastrophe. My experience has been positive. Nothing negative other than more training. Yes, it is positive.
		Don't know anything about it. Don't really know if it made an effect or not. If there is a safety hazard, they point it out, and something gets fixed. It was like that before VPP. I don't see a difference now and before VPP. More information should be put out to the employees regarding lower accidents and injuries, or any differences or impacts that VPP has made in the organization.
		The clinic is a good example of what the other military facilities should strive to do. Don't know how that is possible in a large facility.

The following quotes highlight specific impressions from those interviewed on the question, "Is there anything else you think we should know about the outcomes and effects of being an Army Star Strong site?"

"The patients see the difference, they see the difference with the people who have been here for quite some time. Bringing up issues, regarding

safety or what not. They are learning it too, and they know that they can participate and they bring it up."

"I think there is a lot of pride that goes into it. You change the mentality of the organization where they actually are working to protect fellow staff members and your clients or your patients in our facility. Or if I am supervising a motor pool, you are trying to make sure that everyone who comes into the motor pool is kept as safe as possible when in that area. There is a lot of pride. The greatest thing is getting the mentality to change when they go through the VPP Star Strong Program that actually is the payoff. It is not just getting the flag that is important, because everyone of course wants to make sure you do everything that everyone else does. But more importantly is actually changing the mentality of the unit. We always say Safety First."

"When I first arrived, I thought VPP would difficult. That it would take time to buy into it. By being or having a VPP site, it strengthened the skill set of the BMEDDAC Safety Office, which enabled the DCA, me, to better understand why VPP is important and what VPP is. For example: When I leave to go to my next job, this experience has showed me, "this is what right should look like." This is the biggest outcome of having a VPP site, knowing "this is what right should look like." On my arrival, the BMEDDAC Safety Office staff bought into the VPP

program. The safety office staff saw the importance of it and laid the groundwork and the path for success. The safety office staff went forward to implement the VPP program throughout the footprint. Knowing it would be challenging, but fully supporting the VPP program."

"The program is definitely beneficial to ANY type of entity. It does improve staff safety tremendously. And as a result of that, patient safety, tremendous and recognizably. The program comes with cost though. Including Stage 1, there is not much additional time and resources that need to be spent to establish compliance. The biggest challenge that we did see in Stage 1, was that the clinic does not have a certified safety and industrial hygiene staff assigned to them. The situation was actually made worse as the industrial hygiene staff supporting the clinics are not even assigned to MEDCOM. From Stage 2 on, and especially reflecting on the latest results of assessments conducted by MEDCOM, it is beneficial to the assessed entity (the clinic being assessed), that documents and reports required or mandated thru the MS2/VPP program, are generated, trended, and evaluated to closure by clinic personnel. It is much better if the clinic has its own dedicated clinic specific products that define clinic needs, necessities, and challenges. There was a change from the past to today from our perspective, on how the MEDCOM is assessing clinics. This change reflects that all clinics possess solely clinic

"applicable" data to include documents. Obviously, higher headquarter documents can be used, but clinics need to be proficient to show and communicate clinic specific abatement actions to the survey group. Especially related to the safety strategic plan. MEDCOM concerns did exist that clinics were not aware of, not able, or not trained in the importance of setting SMART goals. In reference to the "effects" of being an Army Star Strong" site, is the pride within the organization. It also needs to be recognized that the implementation of the VPP does not come cheap. What is meant with this statement, is that there is additional work that needs to be done. The expectation of staff at all levels is centered on implementation of this program which potentially mandates commanders to clearly define or review their priorities."

"It will be interesting to come back here in five years, to see if the mentality still be the same? Sometimes when you get into a big push for something, it is in the forefront of everyone's mind, but with time, it falls off the plate as the next big program comes up and it gets pushed. It becomes like the rolling twelve, it fall off the end someplace else. Without command emphasis, it has the potential to peter out like any safety program can be. It really has to have the command emphasis, as new people and leadership comes in, just to see where they take it. Will it just become a flag on the wall? Illesheim did a first - kudos. It was great for the people who were there. I saw it definitely get ramped up. To

come in before it was a big ramp up, when people saw things, then someone from leadership had to come by to see it, to get something done with it. To seeing it where staff members are identifying the hazards now and they want ownership of it; they want to have involvement with it. I am curious to see if that momentum stays the same. Was the benefit of the program from the development of the program or is the benefit of the program is being in the program? It will be interesting, it really will."

"Everything that you have already mentioned about what the Surgeon General has already said. I agree 100%. It has made the clinic a better place to work as far as safety conscious. It is not easy for everyone to make a change, but because the leadership buys into the product, and we do exactly the right thing, then they do not have a choice but to buy into the program. Not that we force them it is just automatically, because it is who this clinic is. The new commander did not know anything about VPP when he got here. But he was very, very supportive. I am sure that he knew based on what the prior commander explained to him. That he had a knowledge of what it was, I do not think he did. Because I did not know either myself. Eventually after he was reading and being informed and all the meetings that I had with him to keep him updated on what is going on, of course we learned the program together as well. It was hard. But now that's it. I am very blessed and lucky with what we have done in this clinic. Everybody here is so good to work with, very respectful, and

they pretty much do things sometimes without even asking, because they know it if the right thing. We teach to lead by example. It is the setting from leadership to leadership. The prior commander was here when I got here, his persona in dealing with people was so nice and so welcoming, that even if he chewed you out, you did not feel like he was chewing you out. It was more like he said, this is what happened, this is what we can do better to fix it. He treated me like an adult, not like a little kid. We do the same thing with our staff. We treat them with respect. When we see that when one of our leaders is treating someone the way they should not be treated, we talk to that leadership or that person and say that you cannot treat Soldiers like this. Our leadership participates in everything that the Soldiers do. You will see myself, the commander, and the executive officer throwing salt outside, or shoveling snow, or doing police call and picking up cigarette butts. You go to other clinics, and I can guarantee you, that 99.9% you will not see the commander, you might not see the executive officer doing that, because they are doing administrative stuff. You cannot do that if you want to let the Soldiers know. Ever since I got here with the former commander and myself, and with the current commander, and the new executive officer. Because we don't have a choice. If the commander is out there, why would I be sitting in my office not doing anything? It is just not right. I send the wrong message. I feel wrong not doing it. I stop what I am doing and I go and knock it out and come back and do my administrative stuff.

Administrative stuff is secondary to everything. If you take care of you patients first over administrative, or if you take care of your staff over administrative work, because that is what we get paid the big bugs to stay until 10:00 at night. But the Soldiers need to be taken care of. And that is our policy. Everything flows like a domino effect. And I think that is why it works, because we set the standard, we go out there, and we lead by example, and not from the back. Unlike other organizations, they just tell the Soldiers and the staff this is what you need to do, and then they disappear. In my opinion. Every time we go up to the command and staff and they ask, what do you guys do? I just don't want to tell the commanders the truth. I am a captain and they are lieutenant colonels. But that is the truth here in the clinic. It is a simple truth. Lead by example and everything is a domino effect. The Soldiers will do it on their own. When you have a leader or supervisor spending fifteen minutes looking for a Soldier to go change a sharp container, and it is just as easy for you to just grab the key and change the sharps container, right? In other organizations, you have leaders and supervisors like that. Here, if I see that, I go and change it, because I know where the key is. Hey sir, I got this, I can do this. And I say, no, I have both hands, thank you very much, just let me know if I am doing anything wrong. As leaders, we are not afraid to ask our subordinates, which is our lower enlisted, can you show me how do you do this? I am not afraid, the commander, and the executive officer are not afraid that our subordinates

can tell us, hey sir, you are doing this wrong. We say, ok, and we move on. That is the key. In a lot of organizations, I think it is hard for the leadership to accept that they are wrong. And then they set the wrong standard, to their subordinates. It is a product that works 100%. You do not have to put in any effort, because we do it all the time. That is what I tell people, you do it all the time, you lead by example, you go and do the right thing, and the Soldier s will follow. If you don't, they are not going to care, and you will struggle to make them change. Because you lose their trust, they lose your trust, and when you try to tell them to do something, they say, ok, whatever. They have to listen, because they have to, but they turn around and say ok, whatever."

"In the end, I believe that if you are going to operate in the military, these additional voluntary programs that we implement, are just adding jobs that is all they are doing. These safety personnel, I am not trying to say, I don't know anything about your position personally, I am not trying to anything about that. I am trying to say that it becomes top heavy, headquarters does. That if you add another safety regulation it has to be someone that it falls under, that someone monitors these safety protocols, safety regulations or the safety operations, someone has to regulate that, and that creates jobs. Then when they say, well maybe we don't really need these safety models anymore, since we are operating like that now, or we are operating in these safety models, then, people

are trying to keep their jobs, job security, is what people are aiming for sometimes. To me, these additional safety protocols, are something we are already doing. A laboratory, for example, would be like CAP, the College of American Pathologists says that we have to operate our laboratories in these manners, and a lot of it is safety, personal protective equipment, patient identifications. And then we have now, an additional one, these volunteer practices of VPP, even OSHA plays into this a little bit. Now we have almost three fold of the exact same regulation (CAP, Army, VPP). Joint Commission is another voluntary service/organization, is it not? So we are being involved into these voluntary services/organizations so that we can earn their status, and their status is respected amongst a dozen other safety organizations throughout the nation. What I am saying, is that we are tripling or quadrupling it over and over. I have my HAZMAT room inspected by four different groups, asking the exact same questions. Why do we have three additional groups, when Army regulations from the get go, or even CAP regulations from the get go, already says, that we need to be operating that way. All these overlapping things seem to be that people are creating job security in these other organizations. So to me, VPP is just another book to read, is just another binder on the desk, another system to operate by, but luckily, what the best part is, is that it is not causing that much ripples in the water, because it is the same regulations, over and over again. I can tell you a hundred different things in the

laboratory that are the exact same as CAP. If we just had CAP for the laboratory, then we don't need to operate under Joint Commission, because it is all safety. If the true goal of safety of safety for the patient and the employee is to be reached, then you only need one book to operate by. It becomes convoluted when you add too many books to operate by. That is the way we see it in the laboratory. We are not on the day to day patient care side. I am not trying to be a naysayer. But I am also trying to say I believe we are trying to create job security out there for someone higher up there in the headquarters. It might be a little bit of a conspiracy theory, but nonetheless, it is something to think about."

"Always positive. You cannot not be positive when you are doing the right thing and not causing harm or preventing catastrophe. Of course that is a big thing. Positive. My experience has been positive. Nothing negative other than more training. Sometimes, as a doctor, I would like to try and catch up on my notes. Any training causes me not to do that. So it could be for me learning about trafficking humans and I will complain about that too. I would think this is more relevant training than human trafficking. Yes, it is positive."

"The thing is, is that I don't know anything about it. We had so many accidents, or it was unsafe before, it was fixed, so through the training, people got more aware of it. Then I could give you an answer. But I

don’t really know if it made an effect or not. I know it is not more, but it is not less. Then again I don’t know if we had more accidents or if it is better safety now. I cannot tell you. I think it is a safe place here. And people do say, if there is a safety hazard, they point it out, and something gets fixed. They have to fix it. It was like that before VPP. I don’t see a difference now and before VPP. I think it was the same way before VPP. At least when it came to safety issues. Before this program (VPP) they would always say, if you see something unsafe, that you should report it and take care of it. That is what they would say, before VPP. Supervisors would say that. Now, after VPP, they still say the same thing. She said there should be more information put out to the employees regarding lower accidents and injuries, or any differences or impacts that VPP has made in the organization.”

“I do think that the clinic is a good example of what the other military facilities should strive to do. I honestly don’t know how that is possible in a large facility. You would have to break it down into pieces that are manageable. And if you have a three story hospital with so many different moving parts, I think it would be hard to get them to the standard, but I think they should strive to do what we do.”

Appendix N: Interview Questions - Employees, Supervisors, Clinic Additional Duty Safety Officer and the BMEDDAC Safety Manager

1. How long have you worked here?

2. Were you here before implementation of the VPP at the Illesheim clinic?

3. Were you here during the implementation of the VPP at the Illesheim clinic?

4. Tell me about your job. What do you do during a typical day?

5. Do you believe the implementation of the VPP had any positive outcomes for the clinic in terms of safety outcomes or safety performance? If so, can you give any examples?

6. Do you believe the implementation of the VPP had any positive outcomes for the clinic in terms not related to safety, for example customer satisfaction? If so, can you give any examples?

7. Do you believe you (and all clinic personnel) had to devote more time to conduct mandatory training because of VPP?

8. Do you believe the implementation of VPP has had a positive or negative impact on the clinic's ability to produce RVU's and productivity data?

9. Do you feel there is any additional burden in terms of resources (personnel and time) that is needed to implement/sustain the VPP as opposed to implementing the Army Safety Program or the Joint Commission Environment of Care program?

10. Have the number of accidents and injuries reported by employees of the Illesheim clinic increased after the clinic received Army Star Strong status?

11. Have the number of safety violations written up during the BMEDDAC/clinic safety inspections or the Joint Commission tracer tours decreased after the clinic received Army Star Strong status?

12. Has the amount of time you spend completing mandatory training during the duty day stayed the same after the clinic received Army Star Strong status?

13. If you are a provider, has the RVU workload (productivity) increased after the clinic received army Star Strong status?

14. What does VPP and Army Star Strong status mean to you?

15. Do you know when the clinic started to implement VPP and when they received Army Star Strong status?

16. Do you know what positive outcomes have happened at the Illesheim clinic as a result of achieving Army Strong status?

17. Do you know what important milestone was achieved within the MEDCOM when the Illesheim Army Health Clinic achieved Army Star Strong status?

18. Have the number of hazards found and reported by employees of the Illesheim clinic increased after the clinic received Army Star Strong status?

19. Is there anything else you think we should know about the outcomes and effects of being an Army Star Strong site?

Appendix O: Interview Questions - Commander/Senior Leadership – Illesheim Army Health Clinic/BMEDDAC

1. How long have you been with unit?

2. Describe the type of safety and health hazards at this site and throughout your footprint?

3. How do you demonstrate leadership and commitment to safety and health?

4. Were you here before implementation of the VPP at the Illesheim clinic?

5. Were you here during the implementation of the VPP at the Illesheim clinic?

6. Tell me about your job. What do you do during a typical day?

7. Do you believe the implementation of the VPP had any positive outcomes for the clinic in terms of safety outcomes or safety performance? If so, can you give any examples?

8. Do you believe the implementation of the VPP had any positive outcomes for the clinic in terms not related to safety, for example customer satisfaction? If so, can you give any examples?

9. Do you believe you (and all clinic personnel) had to devote more time to conduct mandatory training because of VPP?

10. Do you believe the implementation of VPP has had a positive or negative impact on the clinic's ability to produce RVU's and productivity data?

11. Do you feel there is any additional burden in terms of resources (personnel and time) that is needed to implement/sustain the VPP as opposed to implementing the Army Safety Program or the Joint Commission Environment of Care program?

12. Have the number of accidents and injuries reported by employees of the Illesheim clinic increased after the clinic received Army Star Strong status?

13. Have the number of safety violations written up during the BMEDDAC/clinic safety inspections or the Joint Commission tracer tours decreased after the clinic received Army Star Strong status?

14. Has the amount of time you spend completing mandatory training during the duty day stayed the same after the clinic received Army Star Strong status?

15. If you are a provider, has the RVU workload (productivity) increased after the clinic received Army Star Strong status?

16. What does VPP and Army Star Strong status mean to you?

17. Do you know when the clinic started to implement VPP and when they received Army Star Strong status?

18. Can you describe any positive outcomes that have happened at the Illesheim clinic as a result of achieving Army Strong status?

19. Do you know what important milestone was achieved (within the U.S. Army Medical Command) when the Illesheim Army Health Clinic achieved Army Star Strong status?

20. Have the number of hazards found and reported by employees of the Illesheim clinic increased after the clinic received Army Star Strong status?

21. Is there anything else you think we should know about the outcomes and effects of being an Army Star Strong site?

22. Are there any benefits in having your unit/organizations achieve Army Star Strong status?

23. What do you think are your facility's best practices in safety and health?

24. How do you address the competing pressures of productivity, mission accomplishment and safety?

Appendix P: List of Abbreviations

American National Standard Institute ....ANSI

American Industrial Hygiene Association.....AIHA

Army Medical Department.....AMEDD

Army Provider Level Satisfaction Survey.....APLSS

Army Medical Command.....MEDCOM

Army Readiness Assessment Program.....ARAP

Australian/New Zealand Standard 4801:1997.....AS/NZS-4801:1997

Bavaria Medical Department Activity..... BMEDDAC

British Standard 8800:2004..... BS 8800:2004

Bureau of Labor Statistics ..... BLS

Code of Federal Regulations ..... CFR

College of American Pathologists..... CAP

Cooperative State Programs ..... CSP

Days Away Restricted Time..... DART

Department of Defense..... DoD

Deputy Secretary of the Army (Environment, Safety, and Occupational Health ..... DASA (ESOH)

District of Columbia.....DC

Environment of Care ..... EOC

Europe Regional Medical Command .....ERMC

Freedom of Information Act.....FOIA

Hazardous Materials.....HAZMAT

International Standards Organization 9001:2000..... ISO 9001:2000

Joint Commission ..... JC

MEDCOM Safety Management System MS2/VPP

National Certification for Quality Analysis .....NCQA

North American Industry Classification System.....NAICS

Occupational Safety and Health Administration..... OSHA

Occupational Health and Safety Assessment Series Standard 18001 .....OSHAS 18001

Patient Centered Medical Home.....PCMH

Relative Value Unit .....RVU

Risk Assessment Code .....RAC

Specific, Measurable, Achievable, Relevant..... SMART

Total Case Incident Rate .....TCIR

Health Care Program of the U.S. Department of Defense Military Health System .....TRICARE

Voluntary Protection Program..... VPP

Voluntary Protection Program Center of Excellence ..... VPPCX