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# Workplace Safety Strategies Used by Managers to Reduce Workplace Accidents

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Abstract

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MBA, Webster University, 2016

BAS, Campbell University, 2014

Doctoral Study Submitted in Partial Fulfillment

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## Abstract

Ineffective safety strategies contribute to work-related accidents making the workplace one of the hazardous locations in the United States. The findings might provide organizational managers with strategies to improve workplace safety practices leading to a healthier and safer work environment. Grounded in Heinrich's safety management systems conceptual model, the purpose of this qualitative single case study was to explore strategies organizational managers used to reduce workplace accidents. The participants consisted of 6 managers who oversaw safety issues at 1 organization in the central region of North Carolina. Data were collected from semistructured interviews and company documents. Data analysis consisted of Yin's 5-phase cycle. Three themes morphed to include enforcing the need for safety training, creating a culture for safety awareness, and implementing company-wide safety policies. A key recommendation is that organization leaders provide safety training, increasing safety awareness, and creating or revising company-wide safety policies. The implication for positive social change includes benefitting local residents through enhanced stability of communities with increased employment opportunities enabling residents to contribute to community betterment to sustain a safe working environment to enhance a safer community.

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# Dedication

Above all, I would like to thank God for providing me with the power and strength to complete this DBA academic journey. Second, I dedicate this doctoral study to the two special women in my life, my mother Valu Bailey, and my wife and best friend, Cindy Vaiagae. Thank you both for your overall patience, love, support, and encouragement throughout my entire doctoral journey. I could not have done it without you both and would not have completed this milestone without you two by my side every step of the way.

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# Section 1: Foundation of the Study

Fifty workers die every day from workplace accidents in the United States (American Federation of Labor and Congress of Industrial Organizations, 2015). Kunyk et al. (2016) stated organizational managers focus primarily on health and safety to reduce workplace accidents. Losing productive employees could damage the organization's reputation and limit organizational managers' understanding of why employees encounter work-related accidents (Kunyk et al., 2016). Organizational managers should not rely on organizational strategies to improve safety in the workplace; rather, they should consider strategic approaches enhancing employee-leader relationships (Alegre, Mas-Machuca, & Berbegal-Mirabent, 2016). Employees need to be comfortable working with managers to increase safety awareness and personal safety (Hofmann, Burke, & Zohar, 2017).

## Background of the Problem

The U.S. Bureau of Labor Statistics (2018) found 2,811,500 reported and recordable cases of work-related injuries and illnesses in 2017. To avoid an increase in the number of work-related injuries and illnesses reported by the U.S. Bureau of Labor Statistics, managers should monitor workplace accidents and report the injuries or illnesses through the Survey of Occupational Injuries and Illnesses (SOII). The SOII is an annual survey used for recordkeeping based on employment size or industry classification (Rappin, Wuellner, & Bonauto, 2016).

Wei, Zhou, Wang, and Wu (2015) stated that safety in the workplace has been an increasing concern for managers and employees. Jitwasinkul, Hadikusumo, and Memon

(2016) mentioned that safety in the workplace is a critical element for increasing efficiency and effectiveness within an organization. Akter, Wamba, Gunasekaran, Dubey, and Childe (2016) noted that creating a safe and productive workplace begins at the strategy level where managers could significantly improve process safety, quality, and production. For long-term success, Chughtai (2015) found organizational managers could invest in safety programs to influence employee safety performance and reduce the risks of job-related injuries. Moatari-Kazerouni, Chinniah, and Agard (2015) and Rezvani et al. (2016) found work-related accidents could affect workers and the organization in negative ways such as injuries in the organization or worker fatalities.

## Problem Statement

Workplace accidents have a negative impact on an organization and its employees (Seabury, Terp, & Boden, 2017). An estimated 80% of workplace accidents can be attributed to employee actions (Krishnan, Hizam, Saffian, Baharun, & Azman, 2017). The general business problem was that ineffective safety protocols contributed to workplace accidents. The specific business problem was some organizational managers lacked strategies to improve workplace safety to reduce workplace accidents.

## Purpose Statement

The purpose of this qualitative single case study was to explore strategies some organizational managers use to reduce workplace accidents. The target population for the study was six managers who oversaw safety issues at one organization in the central region of North Carolina who have developed strategies to reduce workplace accidents. The implication for positive social change includes benefitting local residents through

enhanced stability of communities with increased employment opportunities enabling residents to contribute to community betterment to sustain a safe working environment to enhance a safer community.

## Nature of the Study

I used the qualitative research method. Gehman et al. (2018) contended that a qualitative single case study assists the researcher in understanding the *what*, *how*, or *why* of a phenomenon. Qualitative researchers aim to gain understanding and meaning of underlying reasons, opinions, and motivations of participants related to the phenomenon under study (Dasborough, Lamb, & Suseno, 2015). The quantitative method was not optimal for my study as I did not use statistical data to test a theory or examine relationships of variables. Yin (2018) indicated quantitative researchers measure variables and test hypotheses about variable relationships or group differences addressing the research question. Researchers using mixed methods research incorporate quantitative and qualitative methods to examine and explore variables in one study (Kukla, Rattray, & Salyers, 2015). I did not need to gather data through the quantitative aspect of mixed methods to address my specific business problem; the mixed method approach was not appropriate for my study.

I considered ethnography, phenomenology, and the case study designs. Researchers use an ethnographic design to collect and analyze the research participants' social systems and cultures (Goldstein, Gray, Salisbury, & Snell, 2014; Grossoehme, 2014). The use of the ethnographic design was not appropriate as ethnography involves extended exploration of group culture, which would not have helped me address my

research question. A phenomenological design researcher is focused on the lived experiences of individuals to explore a phenomenon (Gorichanaz & Latham, 2016). A phenomenological design was not appropriate, as I did not need to understand people's lived experiences (Padilla-Diaz, 2015). A case study researcher conducts an in-depth exploration on the phenomenon using *how*, *what*, or *why* research questions (Harrison, Birks, Franklin, & Mills, 2017). In a case study, a researcher explores an in-depth program, event, activity, process, or one or more individuals (Dumez, 2015). A case study has a defined time frame and is bounded by place (Fusch & Ness, 2017). Researchers use case study designs to make inquiries concerning an event, activity, group, or individual using a variety of data collection procedures (Yin, 2018). Case study was optimal to address my research question as my focus was to explore an in-depth situation of a phenomenon bounded by time and place.

## Research Question

What workplace safety strategies do managers use to reduce workplace accidents?

## Interview Questions

1. What strategies do you use to increase workplace safety?
2. How have you measured the effectiveness of your strategies to reduce workplace accidents?
3. What were the key barriers to implementing your workplace safety strategies?
4. How did you address the key challenges to implement your strategies to reduce workplace accidents?

5. What other information would you like to share regarding the strategies you have used to increase workplace safety?

## Conceptual Framework

I chose Heinrich's (1931) safety management systems conceptual model (SMSCM) as the conceptual framework for my study. Heinrich developed SMSCM to introduce the subject of workplace accidents. Using the domino theory, Heinrich revealed accidents result from a chain of sequential events that occur from unsafe conditions or unsafe acts in the workplace. Researchers could use SMSCM as a strong foundational framework to explore strategies to improve safety conditions in the workplace (Hughes, Newstead, Anund, Shu, & Falkmer, 2015). Organizational managers could use SMSCM to focus on effective strategies that will prevent future workplace accidents.

SMSCM was appropriate for my study as it required the organizational leaders, management, and employees to build a learning environment based on effective practices used to reduce workplace accidents. Heinrich (1959) noted the use of SMSCM assists organizational managers in understanding the importance of improving workplace safety. I used SMSCM as a conceptual reference to assist with identifying the safety strategies managers used to understand how six organizational managers properly implemented Occupational Safety Health and Administration (OSHA) and other workplace safety regulations to reduce or mitigate workplace accidents. Use of SMSCM has been influential in identifying, correcting, and educating the workforce in preventing occupational health and safety incidents (Heinrich, 1959). Using SMSCM as the

conceptual framework for this study provided a lens for understanding the findings from my study.

## Operational Definitions

*Employee error:* The behavior and decision leading to an actual or potential consequence for an organization's plans, goals, or processes (Ye, Wang, & Li, 2018).

*Safety management system program:* A safety management system program is a set of policies and standards that explain and regulate the safety rules for the employees of an organization (Federal Aviation Administration, 2019).

*Workplace accident:* Any event in the workplace involving an injury or illness leading to physical or mental harm (Palali & van Ours, 2017).

*Workplace safety:* The action to mitigate hazards in the workplace from individual injury or death (Kabir, Watson, & Somaratna, 2018).

## Assumptions, Limitations, and Delimitations

### Assumptions

Assumptions are facts or events a researcher assumes true without verification by the researcher (Wohlin & Aurum, 2015). My study included three assumptions. My first assumption was that the selected organization would allow me permission to conduct the study on workplace safety. My second assumption was that all participants were willing to participate in the interview process. My third assumption was that participants would provide honest and truthful responses during the interview process.

## Limitations

Limitations are potential weaknesses that may arise in a study, which are out of the control of the researcher (Lewis, 2015). I recognized three limitations in the study. The first limitation was the lack of consistent work schedules of the study participants to interview. Second, there may have been unknown conditions or workplace cultures that could have biased the responses of the study participants. Third, the information received from the interviews may have not been generalizable or transferable to all businesses in the state of North Carolina.

## Delimitations

Delimitations are boundaries researchers impose to focus on the scope of a study (Yin, 2018). I identified three delimitations in the study. One delimitation of the study was selecting participants from one organization. A second delimitation of the study was interviewing organizational managers who had a minimum of 1-year experience practicing strategies to reduce workplace accidents. A third delimitation of the study was selecting participants from the central region of North Carolina.

## Significance of the Study

The findings from this study might be of value to organizational managers in understanding the importance of investing in workplace safety training that focuses on the principles of health, safety, and environment and quality management procedures as part of the organizational business plan. The contribution of strategies used by managers might be of value to businesses through the implementation of effective workplace safety strategies to reduce safety accidents in the workplace. Organizational managers could fill

gaps in the understanding of effective business practices by creating effective safety strategies to reduce accidents related to the risk of employee injuries, fatalities, business downtime, absenteeism, and financial loss. The use of the results of this research study might contribute to the future development of effective workplace safety practices, which could reduce workplace accidents.

## Implications for Social Change

The findings of my study might contribute to positive social change by placing the safety agenda at the center of attention for each employee and to keep them informed of the proper safety protocols. The findings of my study might contribute to positive social change by encouraging employees to volunteer in the community to assist in eliminating safety issues associated with the work environment, education, health, and community. Improving workplace safety and reducing workplace accidents could improve future organizational sustainment, create job opportunities in the local community, and strengthen the economy.

## Review of the Professional and Academic Literature

The primary focus of workplace safety for organizations is to improve the factors leading to workplace accidents (Hofmann et al., 2017; Lay et al., 2017; Taylor, 2015). Workplace safety is the primary focus of managers who have a shared responsibility between the employer and employees (Sheehan, Donohue, Shea, Cooper, & De Cieri, 2016). The total cost of all workplace accidents for all industries in the United States was $59.9 billion in 2016 (Liberty Mutual Research Institute for Safety Index, 2017). Probst (2015) implied managers reported that 80% of workplace fatalities were related to

employee accidents, which left safety risks and issues in the workplace unaddressed, creating a detrimental increase in costs for the organizations. Ocampo and Clark (2015) and Shin, Gwak, and Lee (2015) calculated small and large organizations could reduce accidents in the workplace by 8% if managers reduced staff weekly working hours by one hour. Mansour (2016) explained that organizational managers encountered significant amounts of revenue losses when the probability of workplace accidents is not reduced. Lee (2015) underscored the need for managers of firms and organizations to understand more about the phenomenon and how to reduce workplace accidents through workplace safety.

In this literature review, I explored the challenges that organizational managers encounter regarding workplace safety factors such as safety climate, safety behaviors, safety compliance, safety knowledge, safety management, and safety training to prevent losing employees to workplace accidents. I explored how managers mitigate hazards to prevent death or serious physical harm, ensure safe working conditions by enforcing standards, and provide safety training and assistance to employees and managers. By implementing effective workplace safety strategies, organizational managers could reduce workplace accidents within the organization.

The objective of this qualitative case study was to explore strategies some organizational managers use to reduce workplace accidents. I conducted a literature review to draw on the knowledge created by scholars to understand the phenomenon of reducing workplace accidents. The following comprehensive literature review reflected the results of searches performed through various business, management, and academic

databases: EBSCO, Academic Search Premier, Business Source Premier, Ulrich's Periodical Directory, industry trade journals, various science and psychology databases, Emerald Management Journals, ProQuest Central, ABI/INFORM Complete, Dissertations and Theses Full Text, and SAGE Premier. I also retrieved information from online resources regarding workplace safety such as Questia premier online Research and paper writing resource and Google Scholar. The primary search keywords and terms were: *workplace safety*, *safety management systems*, *Heinrich's domino theory*, *human factors theory*, *theories of safety*, *Six Sigma*, *costs of workplace accidents*, and *Total Quality Management*. The literature review yielded articles in peer-reviewed academic journals, books, transcripts of professional and academic conference proceedings, trade journal reports, and survey data that might have aided in strategies some organizational managers use to reduce workplace accidents.

**Organization of the Literature Review**

A literature review is a critical evaluation of scholarly works in relation to the research question (Passmore, Krauesslar, & Avery, 2015). Evaluating scholarly materials enriches the researcher's skills and ability to synthesize data by deriving meaning through interpretation and analysis (Wohl et al., 2017). The organization of the literature review included an overview of SMSCM, examples of quality improvement frameworks, and an introduction to workplace safety. I discussed factors for improving workplace safety including OSHA training, safety climate, safety behaviors, safety compliance, safety knowledge, safety management, and safety training. Finding appropriate literature for this review consisted of using key terms and phrases to discover how managers reduce

workplace accidents. Using a variety of academic databases, I discovered peer-reviewed articles related to my study. The academic databases were helpful in obtaining literature on theories of safety, learning processes, and workplace safety strategies to reduce workplace accidents.

**Strategy for Literature Search**

I used scholarly journal articles, seminal works, and government articles retrieved from the Walden University library and Google Scholar to gather information for my literature search. I used the literature review to draw on the knowledge created by scholars to understand the phenomenon of increased workplace accidents. The 368 references that comprise my study include 336 (91.3%) scholarly peer-reviewed articles, eight government websites (100%), and four books (100%), which were published between 2014 and 2019 reflecting the last five years before the proposed study completion date. The 209 references that comprised my literature review included 188 (91.5%) references from scholarly peer-reviewed sources, five government websites (100%), and seven books (43.8%), which were published between 2014 and 2019 and reflected the last five years before the proposed study completion date.

**Safety Management Systems Conceptual Model**

SMSCM was developed by Heinrich in 1931. Heinrich (1959) focused on industry-based safety through identification and alteration of unsafe worker behaviors and acts that cause workplace accidents (Amorim & Pereira, 2015). Heinrich offered an explanation to management regarding the use of SMSCM based upon the premise that managers are able to inspire employees to change expectations, perceptions, and safety

awareness to work towards the organizational safety goals. The key concepts discussed within this section are: (a) SMSCM, (b) Heinrich's domino theory (HDT), (c) behavior-based safety, (d) human factors theory, (e) Peterson's accident theory, (f) process mapping, (g) Six Sigma, (h) total quality management, (i) costs of workplace accidents, (j) OSHA training, (k) safety climate, (l) safety behaviors, (m) safety compliance, (n) safety knowledge, (o) safety management, and (p) safety training. Workplace environments are complex and multifaceted; hence, factors that directly and indirectly contribute to the occurrence of workplace accidents cannot be unraveled through simple observation (Li, Zhang, & Liang, 2017). To minimize the chances of workplace accidents occurring, researchers developed analytical models to assist in understanding workplace accidents.

Münsterberg (1913) conducted a simulation-based study of accident and injury prevention. Münsterberg established standards for successfully completing the simulation and the first personnel selection standards for worker safety. Münsterberg ushered in research on the identification of accident-prone individuals, which spanned across businesses, industries, and countries. Münsterberg examined a number of individual and situational variables as research on accident proneness progressed; a growing interest and recognition of the emotional state of workers at the time of accidents developed. Hersey (1932) discovered that workplace accidents were influential in identifying the role emotional states played in a worker's loss of situational awareness resulting in a work-related accident.

McClymer (1974) used the Pittsburgh Survey as a model to analyze working conditions related to worker health and safety. Hofmann et al. (2017) discovered that the Pittsburgh Survey along with public awareness of decaying working conditions led to one of the first worker compensation protected laws in the United States. Kellogg (1909) inspired thousands of researchers to rely on survey methods and self-reports to collect information on issues such as work-related investigations. Hofmann et al. (2017) explained that progress in work-related investigations was developing. Hofmann et al. (2017) revealed that the working environment had become safer evidenced by a significant decrease in accidents, injuries, and fatalities. Although progress in workplace safety has increased, Hofmann et al. (2017) insisted further research was necessary to ensure a continued decrease in work-related accidents.

Pillay (2015) claimed understanding of how safety management systems prevent workplace accidents was derived from five generations of safety. Heinrich, Petersen, and Roos (1980) and Pillay (2015) identified the first generation as the technical generation, which consisted of a management system of standards and guidelines to prevent unsafe acts. The second generation was behavior-based, which included human behaviors and human errors (Heinrich et al., 1980; Pillay, 2015). Trist and Bamforth (1951) revealed the third generation was the sociotechnical generation, which consisted of ergonomics, human factors, engineering, and approaches for managing safety such as the design of workstations and controls. Pillay (2015) labeled the fourth generation as the cultural generation, which consisted of organizational and cultural factors in major accidents on research from engineering, management, psychology, and sociology. Pillay (2015)

concluded that the fifth generation was the resilience generation, involving organizational learning on safety management strategies from adaptation to improving safety before the occurrence of organizational failure and harm. Shappell et al. (2007) agreed with Heinrich's (1931) concept that safety management systems contributed to unsafe acts and conditions that cause safety accidents in the workplace. Shappell et al. (2007) discovered that operators focused more on unsafe conditions or equipment when 90% of safety incidents were a result of unsafe acts. Shappell et al. (2007) indicated changing unsafe behaviors in the workplace were intermediate factors towards improving health and safety.

Heinrich (1959) noted that efforts to improve safety performance do not interfere with production. However, Orogbu, Onyeizugbe, and Chukwuma (2018) reported an increasing uncertainty pertaining to safety practices exists. Bird (1974) agreed with Heinrich (1959) that work-related accidents could be personal and work-related. The responsibility for improved safety performance has remained a priority for organization managers in providing a safe work environment (Bird, 1974). Providing a safe work environment could assist in safeguarding workers from becoming susceptible to workplace accidents (Orogbu et al., 2018). Unnikrishnan, Iqbal, Singh, and Nimkar (2015) stressed organizational managers should implement safety-training strategies that would result in the improvement of workplace safety, a reduction in workplace accidents, and an increase in the production of the business.

**Heinrich's domino theory.** Heinrich's (1959) domino theory is a compliment to SMSCM as both frameworks involve accidents occurring from interactions among

humans, machines, or the environment. Awal and Hasegawa (2017) asserted that HDT provides an explanation of accidents occurring in a chain of events related to individual faults and undesirable personality traits passed through inheritance or from a social environment. Hosseinian and Torghabeh (2012) acknowledged that Heinrich introduced the subject of accident causation. Hosseinian and Torghabeh (2012) defined HDT as a systematic way of ascertaining the components of accidents. HDT corresponds to the desired organizational managers have in improving workplace safety strategies (Hanaysha, 2016). Organizational managers could sustain a competitive advantage by obtaining resources regarding new safety processes and accident prevention training (Hanaysha, 2016).

After conducting studies on statistical accident analysis, Heinrich (1959) proposed accidents occur in a chain of events. Heinrich explained the worker's fault could be associated with other factors in sequence such as the domino effect. Heinrich (1959) noted ancestry and the social environment as the first domino. Heinrich (1959) clarified that undesirable personality traits are inherited or are developed from a person's social environment and both factors contribute to the faults of a person. The second domino addresses worker personality traits (Hosseinian & Torghabeh, 2012; Wang & Griffis, 2018). Heinrich (1959) explained that inborn and obtained character flaws contribute to accident causation. Heinrich (1959) claimed that natural or environmental flaws in the worker's family or life cause these secondary personal defects, which are themselves contributors to unsafe acts or the existence of hazardous conditions. Awal and Hasegawa (2017) and Schorn (2017) stated that the third domino is a direct cause of unsafe acts

committed by the individuals and the existing mechanical or physical hazards. The fourth domino includes accidents from events the individual encounters such as falls or the impact with moving objects resulting in injury (Wang & Griffis, 2018). The fifth domino consists of injuries resulting from accidents such as fractures (Schorn, 2017).

Heinrich (1959) listed four categories of why individuals commit dangerous acts: (a) improper attitude, (b) lack of knowledge or skill, (c) physical unsuitability, and (d) improper mechanical or physical environment. Heinrich later subdivided the categories into ’direct’ and ’underlying’ causes and concluded that a combination of multiple causes creates a systematic chain of events that could lead to an accident. By using the five metaphoric dominoes, Heinrich posited a linear cause-effect relationship among various social and individual factors. Holizki, McDonald, and Gagnon (2015) and Osibanjo, Gberevbie, Adeniji, and Oludayo (2015) claimed workplace accidents occur through inadequate supervision, insufficient safety training, or working in unsafe environments, which might contribute to an increase in accidents. Hubbard and Lopp (2015) and Gravina, Cummins, and Austin (2017) indicated management is responsible for ensuring the appropriate training for employees in workplace safety.

Unnikrishnan et al. (2015) found the development and sustainment of safety training might result in the improvement of workplace safety, a reduction in workplace accidents, and an increase in organizational performance. Heinrich (1959) identified the factors leading to workplace accidents through the domino theory and suggested removing one of the domino factors could prevent workplace accidents. Asanka and Ranasinghe (2015) revealed that HDT was expanded by introducing management

competencies. Asanka and Ranasinghe (2015) reviewed Heinrich's theory and indicated although Heinrich's theory was understandable and perceptible, blaming the worker is not practical without incorporating some responsibility towards management.

**Behavior-based safety.** The concept of behavior-based safety (BBS) originated from the works of Heinrich in the 1930s to 1940s (Jasiulewicz-Kaczmarek, Szwedzka, & Szczuka, 2015). Wang and Griffis (2018) examined BBS using the zero-incident safety model (ZISM). ZISM is a compliment to SMSCM and could also serve as a guide for continuing increased safety performance to achieve uninterrupted production in the business (Wang & Griffis, 2018).

Jasiulewicz-Kaczmarek et al. (2015) incorporated HDT in providing an in-depth understanding of the topic of BBS and workplace accidents. Geller (2005) described BBS as the what and why of people's actions and applied BBS as a research technique to improve the behavioral process. DePasquale and Geller (1999) suggested further research of BBS is the first step in understanding what factors are necessary for BBS implementation. Jasiulewicz-Kaczmarek et al. (2015) claimed critical factors that contribute to workplace accidents were hazard identification, dangerous goods, and housekeeping. Choudhry (2014) suggested goal setting, feedback, and an effective measure of safety behavior as potential factors to improve safety management systems. Choudhry noted that BBS implementation, if applied properly, could be an effective approach toward improving the safety of workers. Jasiulewicz-Kaczmarek et al. (2015) confirmed a strong correlation between accident rates and the work environment.

Jasiulewicz-Kaczmarek et al. (2015) discovered the safer the environment the lower the hazard of the accident rate.

Based on the level of hazard control, organizational managers use BBS as an effective approach to minimize hazards in the management of employee safety issues (Li, Lu, Hsu, Gray, & Huang, 2015). BBS is an internal safety measure used to protect the health and safety of the employees and provide a safe working environment (Kim, Park, & Park, 2016). The emphasis of accident prevention training has assisted organizational managers with gaining more knowledge obtained by investigating the behaviors of employees (Hanaysha, 2016). Alignment with BBS processes will increase the overall safety of working environments. Saifullah, Alam, Zafar, and Humayon (2015) stated organizational managers are able to sustain a competitive advantage by obtaining resources regarding new processes and accident prevention training. In line with SMSCM, reducing unsafe behaviors in the workplace, improving BBS models, and processes could possibly increase safety in the workplace (Guo, Goh, & Wong, 2018).

Federal Aviation Administration (2019) described safety management systems as a systematic approach to managing safety risks and assuring the effectiveness of safety risk controls. Heinrich (1959) construed 10% of accidents and occupational diseases caused inappropriate working conditions, while 90% of accidents were the result of employee behavior. Among the numerous considerations related to SMSCM, Jasiulewicz-Kaczmarek et al. (2015) highlighted how the capability of BBS processes to increase safety could reveal strengths, weaknesses, opportunities, and threats between employees and supervisors. Despite the lack of definitive evidence, Li and Yu (2015)

noted key aspects of the safety management systems, especially as applied to workplace safety, make the SMSCM relevant for future research. Nunu, Kativhu, and Moyo (2018) using the safety management systems provided specific initiatives such as the card-issuing system.

Yuan and Wang (2012) asserted that the BBS card-issuing card system is a behavior observation method, which evaluates the safety behavior of the employees based on employee feedback. Williams (2005) stated that by increasing safety feedback in the organization, employees could reduce barriers between each other. Nunu et al. (2018) revealed that card systems affect the workers' perspective of safer work practices. For example, Nunu et al. (2018) stated in one company, two types of BBS cards were issued for each worker: Green cards and yellow cards. A worker received a green card (rewarded by management) for following the company's standards appropriately; a yellow card (summoned by management for reorientation) for not following the company's standards accordingly (Nunu et al., 2018). Nunu et al. (2018) concluded the higher number of green cards issued led to fewer accidents.

Nunu et al. (2018) explained the purpose of the system was to motivate workers with rewards for displaying safety behavior. Chen and Tian (2012) noted sufficient evidence exists that the BBS issuing card systems are effective world and industry wide. In addition to decreasing accident occurrence, Williams (2005) recommended BBS training to help improve the safety communication between employees using feedback to correct and reward. Williams (2005) concluded encouraging employee behavior toward safer work habits is a key component to avoiding injuries in the workplace.

SMSCM has been used to assist researchers on practical studies of the model and explain influences on workplace safety (Wachter & Yorio, 2014). Jasiulewicz-Kaczmarek et al. (2015) discovered SMSCM might assist researchers with an understanding of behavior between management and employees through an in-depth understanding of BBS. Sekar and Siddiqui's (2015) demonstrated the implementation of the BBS program in the construction industry reduced accident rates. Sekar and Siddiqui (2015) explored how safety management systems are applicable to workplace safety by applying SMSCM to the exploration of the BBS program. Sekar and Siddiqui (2015) discovered employee behavior and accident rates depended on the implementation of BBS programs.

## Contrasting Theories

**Human factors theory.** Shuen and Wahab (2016) argued that the human factors theory (HFT) is a contrasting theory to SMSCM as HFT is the involvement of events occurring sequentially caused by human error. Ferrell (1977) designated HFT as a field of study. Ferrell developed HFT based on the chain of human factor events leading up to an accident. De Camp and Herskovitz (2015) and Lyndon et al. (2015) supported Ferrell's (1977) assertions that human factors were the causes of accident occurrences when engaged in three situations. Ferrell (1977) claimed that HFT is comprised of three components: overload, improper response, and improper activity. The premise of the HFT is human errors are the leading causes of accidents concerning unsafe acts in the workplace (Javaid, Isha, Ghazali, & Langove, 2016).

Asanka and Ranasinghe (2015) and Gyunka and Christiana (2017) identified the negligence of the worker as the number one human factor leading to accidents. Workers are negligent when human factors are affecting safety (Hubbard & Lopp, 2015). Managers have the responsibility of providing employees with training, education, and tools to develop a safe and productive work environment. Chikono (2017) referred to the interaction between manager and employee contributions to potentially hazardous conditions as uncertainties and unpredictability. Individuals understanding potentially hazardous conditions and safety-related knowledge might control, eliminate, or reduce the safety risk (Zhang, Boukamp, & Teizer, 2015). Proctor and Chen (2015) explained managers and employees appreciated HFT in an organization as both benefitted from understanding how to avoid potential hazards involving risk. Javaid et al. (2016) specified when a worker recognized unsafe conditions and related hazards, an individual exhibited risk or hazard consideration. Feng, Zhang, and Wu (2015) explained the negligence of human factors caused higher accident costs in the organization. Feng et al. (2015) stated organizational managers who are expected to capitalize on product quality and cost reduction, rely on the implementation of quality improvement strategies. Three examples of quality improvement strategies are process mapping (PM), Six Sigma, and Total Quality Management (TQM).

**Peterson's accident theory.** Peterson introduced accident theory as an extension of HFT in 1982 (Alaswad & Xiang, 2017). Peterson (1982) introduced aspects associated with human factors as the decision to error, ergonomic traps, and system failures. Moura, Beer, Patelli, Lewis, and Knoll (2016) posited that accidents caused by incidents induced

errors. Under Peterson's theory, Goode, Salmon, Lenné, and Finch (2015) attributed major industrial accidents to the cause of safety management systems. Babiceanu and Seker (2016) asserted system failures that occurred from production systems fail to function as expected. System failures had an original cause, which probably evolved into human error (Alaswad & Xiang, 2017). Salmon et al. (2017) found systems failure was present when employees did not abide by the standards designed to ensure the safety of products, employees, and activities. Aitsi-Selmi and Murray (2016) analyzed the origins behind the Chernobyl disaster in the former Soviet Union and identified the error on the part of nuclear plant operators, which caused subsequent explosions of the plant from the lack of cooling. Klement (2018), an incident theorist, stated accidents arise from conscious or unconscious decisions to error. A conscious decision involves an individual making an unsafe decision while knowing the probable consequences and the magnitude of risk involved (Phillips, Fletcher, Marks, & Hine, 2016).

Kumar, Gupta, Agarwal, and Singh (2016) indicated the risks associated with decisions made had an impact on why individuals committed human errors leading to accidents. Zhou and Lei (2017) noted that unconscious decisions entailed individuals making unsafe decisions without knowledge. Zhou and Lei discovered conscious and unconscious decisions by low-level skilled or experienced individuals were components leading to latent and active human errors in workplace accidents (Thompson, 2015). Accident theorists blamed accident occurrences on ergonomic traps, organizational practices deemed correct with latent errors in management function (Sabran, 2016). Safety practices were not deemed hazardous until the occurrence of an accident (De

Camp & Herskovitz, 2015). De Camp and Herskovitz (2015) uncovered inappropriate responses from organizational management that could be among ergonomic causes of workplace accidents. Although the incident theory has taken root in modern safety studies, the theory does not offer a comprehensive explanation of all accidents (Leveson, 2015). The placement of accident blame on human factors is the central focus of the accident theory (Ergai et al., 2016).

## Examples of Quality Improvement Frameworks

**Process mapping.** Process mapping (PM) is an essential process improvement tool and a common approach to management planning (Rybicka, Tiwari, Del Campo, & Howarth, 2015). Aligned through the lens of the SMSCM, PM could be evaluated from a systems perspective, which could provide the visualization and description of workflow in an organization (Rohani & Zahraee, 2015). White and Cicmil (2016) regarded PM as a primary quality improvement approach. PM has also been widely applied in various industrial contexts and laboratory settings (Rohani & Zahraee, 2015).

Tyagi, Choudhary, Cai, and Yang (2015) indicated PM in a safety management system is effective in initiating new programs for organizational improvement. One major challenge encountered by managers in the implementation of a process improvement program is understanding how to begin the process (Tyagi et al., 2015). PM is the facilitation of identifying starting points. PM is effective in visibility improvement for complex organizational processes (Tyagi et al., 2015). Outsourcing PM to third-party agents could assist organizational managers in the development of successful process mapping for client businesses (White & Cicmil, 2016). White and Cicmil (2016) stated

that if the intended purpose of PM is to gain an in-depth understanding of business processes for quality improvement, the effectiveness should remain the same regardless of whether an organization chooses to outsource or conduct internally PM processes. Heinrich (1959) upheld SMSCM could assist researchers with the PM initiatives to focus on a clear understanding of organizational processes and aid in the acquisition of knowledge resources. White and Cicmil (2016) indicated the value of PM prevented some organizational managers from obtaining knowledge resources.

In addition to the HDT framework, Heinrich (1959) used SMSCM to frame the use of PM in eliminating safety hazards. Zhou, Fang, and Wang (2008) discovered that unsafe behaviors in the workplace are important factors to consider in enhancing health and safety measures. PM is an effective tool for identifying and eliminating unsafe behaviors found in each process within the workplace and or organization in order to increase safety (Swuste, Theunissen, Schmitz, Reniers, & Blokland, 2016).

**Six sigma.** The concept of Six Sigma originated by Motorola Inc. in the USA in 1985 (Linderman, Schroeder, Zaheer, & Choo, 2003). Six Sigma is a strategy in safety management systems in which errors are indentified and corrected through safe processing. Berta et al. (2015) and Jain and Moreno (2015) affirmed that SMSCM is a model, which researchers use to improve organizational growth through continuous process improvement and adaptation and quality control processes such as Six Sigma. Cherrafi, Elfezazi, Chiarini, Mokhlis, and Benhida (2016) discovered that Six Sigma is a quality improvement framework focused on the elimination of defects with the goal of cost reduction and quality management for products and services. Aarseth, Ahola,

Aaltonen, Økland, and Andersen (2017) proposed an approach that added environmental and social dimensions to the consideration of economic earnings received through lean actions.

By providing continuous improvements to worker safety, recognizing safety as a business process, and assisting organizational managers with the framework of safety policies, processes, and procedures, SMSCM is important to the triple bottom line (Rebelo, Santos, & Silva, 2016). The three aspects of sustainable development include social, economic, and environmental dimensions (Porteous, Rammohan, & Lee, 2015). To sustain and maintain safety performance throughout an organization, Porteous et al. (2015) noted that the TBL concept could improve morale, safety culture, workforce, trust, and compliance. The social dimension is the action taken to capture the impact of an organization, product, or process on society from lawful employment and freedom of association (Porteous et al., 2015). The economic dimension is the cost and life-cycle cost linked to the profitability of an organization from resource use of energy, water, materials, and hazardous substances to waste management of water and materials (Porteous et al., 2015). The environmental dimension is any action protecting vital environmental functions for future generations (Helleno, de Moraes, & Simon, 2017). Two common Six Sigma models are the Define; Measure; Analyze; Improve; and Control (DMAIC) approach and the Define; Measure; Analyze; Design; and Verify (DMADV) approach (Sharma, Gupta, & Saini, 2018; Sin, Zailani, Iranmanesh, & Ramayah, 2015). Implementing the DMAIC approach is useful in addressing the current process and the DMADV approach is suitable for improving the quality in project

deliverables, both are methodologies that could eliminate safety defects to enhance process improvement (Sharma et al., 2018).

Gianni and Gotzamani (2015) recognized maintaining safety and the integration of Six Sigma could assist in sustaining management systems. Von Thiele Schwarz, Hasson, and Tafvelin (2016) asserted Heinrich's SMSCM could correct previous safety problems, which might improve management safety practices and reduce workplace accidents. Woods, McMurtrey, and Griffin (2016) determined that Six Sigma enhanced quality improvement while gaining customer trust and enhancing an organization's competitive advantage. Ramesh, Manickam, and Prasanna (2016) ascertained the implementation of DMAIC and lean thinking philosophies improved the effectiveness of equipment operations, resulting in cost reduction of equipment replacement. Jacobs, Swink, and Linderman (2015) specified the contribution of Six Sigma to organizational performance success by early adopters of Six Sigma experienced fewer benefits as compared to late adopters.

**Total quality management.** The concept of total quality management (TQM) is a continuous improvement technique with an approach similar to safety management systems but with a focus on product quality (Ramesh & Ravi, 2013). TQM originated and was influenced by Deming, Juran, and Feigenbaum in Japan in the 1940s (Powell, 1995). TQM is a comprehensive management system like SMSCM and Six Sigma, which emphasizes the maximum commitment of every member of staff in sustaining and improving organizational performance (Al-Dhaafri, Al-Swidi, & Yusoff, 2016). Businesses implemented TQM in various approaches as a quality improvement tool for

service and organizational managers (Khanam, Siddiqui, & Talib, 2016). With the advent of TQM used globally, organizational managers find it difficult to remain competitive without delivering top quality products and services. Bajaj, Garg, and Sethi (2018) regarded TQM as a contemporary management philosophy aiding organizational managers in meeting technology and competitive challenges in the global context.

Al-Dhaafri et al. (2016) described TQM as a contribution to safety management systems through positive outcomes to quality improvement and performance success. Herrero, Saldaña, del Campo, & Ritzel (2002) indicated implementing the TQM philosophy could improve management inside an organization and could provide special attention to the improvement of safety and environmental management. Thai and Jie (2018) revealed that TQM implementation contributed to the improved quality and performance success among shipping companies. O'Neill, Sohal, and Teng (2016) reported that continuous improvement of TQM in organizational functions and operations to manufacture and deliver products and services will satisfy customer demands. Albliwi, Antony, and Lim (2015) claimed TQM implementation facilitated organizational innovation, resulting in an improvement of the overall competitive advantage of an organization. Honarpour, Jusoh, and Md Nor (2018) mentioned in order to gain competitive advantage, organizational managers should rely on TQM strategies and practices. Jaca and Psomas (2015) found no correlation between TQM implementation and performance success of organizations exists. Jaca and Psomas (2015) discovered no evidence exists for performance success in firms implementing TQM. Valmohammadi

and Roshanzamir (2015) noted the success and effectiveness of TQM implementation in organizations improved firm performance and made innovation success more probable.

Cherrafi et al. (2016) and Honarpour et al. (2018) asserted that TQM contributed to the positive success of quality improvement and performance among organizational managers. Thai and Jie (2018) found that TQM implementation among shipping companies in Singapore contributed to the improved quality and performance success. O'Neill et al. (2016) revealed similar findings claiming TQM implementation facilitated organizational innovation and improved the overall competitive advantage of organizations. Heinrich's (1959) SMSCM was used to frame the implementation of TQM initiatives in order to enhance safety as part of the organizational culture. Al-Dhaafri et al. (2016) contended that TQM is a quality improvement tool that maximizes the commitment of staff members in achieving the highest organizational performance. Álvarez-Santos, Miguel-Dávila, Herrera, and Nieto (2018) noted that the use of SMSCM strongly supports the use of TQM initiatives considering the premise of safety management systems is to eliminate unsafe acts and conditions that cause safety accidents in the workplace. Developing TQM initiatives that work towards achieving optimal safety management systems and qualities could assist in eliminating unsafe conditions and or incidents.

**Introduction to Workplace Safety**

National Safety Council (2018) found a worker encounters a work-related accident every seven seconds, resulting in 104 million production days lost due to work-related accidents. Researchers have studied workplace safety since 1933 (Hofmann et al.,

2017; Probst, 2015). President Nixon signed the OSHA Act of 1970 assuring safety awareness and healthful working conditions for men and women (Bohme, 2015). The U.S. federal government created OSHA to develop, enforce, and maintain an effective program of collection, compilation, and analysis of OSHA statistics related to workplace safety (Drudi, 2015). The National Institute for Occupational Safety and Health (NIOSH, 2018) was developed by OSHA to conduct research on worker safety and health and management of work-related accidents (Hofmann et al., 2017). The establishment of the OSHA Act of 1970 was to provide research, information, education, and training in the field of occupational safety and health (Lewis, 2016).

Wei et al. (2015) contended the most accurate predictor of accidents in the workplace was the high level of uncertainty. Reason (2016) recognized an employee would remain with an organization if the employer could prevent costly errors and diminish the risk of potential accidents in the workplace. Jehanzeb, Hamid, and Rasheed (2015) added that employee relationships with the organization, supervisor, and coworkers influenced job satisfaction. Wiengarten and Longoni (2018) analyzed employee workplace accidents and discovered accident-prone personalities and uncertainties were essential predictors. Cabral, Eggenberger, Keller, Gallison, and Newman (2016) claimed that managers use a management tool known as a safety checklist to mitigate human error, improve employee communication, and enhance a culture of safety. Cabral et al. (2016) stated some researchers recommend improving the culture of safety by implementing existing safety practice procedures. Wei et al. (2015) aimed to enhance understanding of why occupational safety is important and how

occupational safety could be addressed. Paradis, O'Brien, Nimmon, Bandiera, and Martimianakis (2016) claimed that safety accidents continued to increase as many organizational managers continued to make improvements to the safety of the workplace. Shuen and Wahab (2016) determined 88% of accidents were a direct result of unsafe human behavior, 10% of accidents were a direct result of the unsafe physical environment, and 2% of accidents were by human error.

Beus, McCord, and Zohar (2016) and Carayon et al. (2015) described workplace safety as a system-level attribute of the degree of protection against harm. Menger, Rosecrance, Stallones, and Roman-Muniz (2016) posited that managers sought to reduce workplace accidents in the organization to promote the overall safety of an organization. Jain and Moreno (2015) revealed examples of reducing exposure to stress and improving overall safety culture as factors affecting safety within organizations. Perez (2016) asserted personality types and assessments of employees in managerial positions had a significant level of impact on safety culture. Perez (2016) noted senior employees in managerial positions adapted more to safety culture than junior employees in managerial positions. Perez (2016) stated senior managers were able to alter workday start and finish times and participate in more activities focused on improving safety than junior employees.

Amorim and Pereira (2015) claimed knowledge regarding safety initiatives might be employed and / or improved upon implementation within the organization. Martin, Karanika-Murray, Biron, and Sanderson (2016) devised a framework modeled on the intervention research process consisting of a developmental phase, implementation phase,

and effectiveness phase to promoting a safety culture. Martin et al. (2016) noted the developmental phase involved enhancing people's health; the implementation phase focused on components of intervention and delivery to people; and, the effectiveness phase aimed at reducing illnesses or disabilities and worker exposure to hazardous conditions. Accidents in the workplace are attributed to the circumstances that result in industrial accidents in the workplace environment (Amorim & Pereira, 2015). Workplace environments have complex and multifaceted factors that contribute to the occurrence of workplace accidents; yet could not be unraveled through observation (Li & Yu, 2015). Organizational managers could contribute to multiple efforts in increasing safety by hiring and ensuring managers have a safety-centered mindset and priority (Menger et al., 2016).

**Costs of workplace accidents.** The costs of workplace accidents are motivating factors for improving safety performance (Chadwick & Raver, 2015; Feng et al., 2015). Liberty Mutual Research Institute for Safety Index (2017) estimated the total cost of all workplace accidents for all industries in the United States to be $59.9 billion. Ocampo and Clark (2015) and Shin et al. (2015) suggested small and large organizations could reduce accidents in the workplace by 8% if managers reduced weekly working hours by one hour. Mansour (2016) explained that organizational managers encountered significant amounts of revenue losses when they did not reduce the probability of workplace accidents. Rathi and Lee (2015) recommended reducing attrition rate and retaining skilled employees by focusing on safe work practices involving various health and safety programs. Rathi and Lee underscored the need for managers of firms and

organizations to understand more about the phenomenon and how to reduce work-related accidents. Probst (2015) observed some managers reported 80% of fatalities were related to employee accidents, which left safety risks and issues in the workplace unaddressed creating a detrimental increase in costs for organizations.

Hollenbeck (2015) admitted organizational managers could benefit economically when an employee accepted another management position. An organization would have to spend 250% of employee salary on replacement onboarding costs (Haider et al., 2015). The value of hiring a skilled employee is crucial as the organization is responsible for the cost to advertise the available position, employee screening, employee background checks, interview, and hiring and training costs (Blatter, Muehlemann, Schenker, & Wolter, 2015). SMSCM could prove the need to increase safety measures and decrease safety risks in the workplace. Organizational managers could strive for decreasing employee accidents while leaving organizational costs such as hiring, training, and onboarding costs as unaddressed safety risks (Blatter et al., 2015; Haider et al., 2015).

Managers invested in safety management through outsourcing as external service providers were cost-effective (Legg, Olsen, Laird, & Hasle, 2015). Managers allowed an organization to continue delivering physical products to their customers (Nenonen, Kivistö-Rahnasto, & Vasara, 2015; Nordlöf, Wiitavaara, Winblad, Wijk, & Westerling, 2015). Managers offered customers the option to continue conducting future business by assessing the quality of service from their employees (Nenonen et al., 2015). Managers considered reoccurrences of accidents and inaccuracies in reporting in the workplace in the system (Nordlöf et al., 2015). Firms could manage cost through other means if

managers invested in safety management through outsourcing (Nenonen et al., 2015). Outsourcing might serve as a reference point for future researchers to delve into managing costs and increasing safety culture and management in the workplace (Hale, Borys, & Adams, 2015). Outsourcing is an example of how firms could minimize safety risks and or accidents (Lo, Pagell, Fan, Wiengarten, & Yeung, 2014).

**Factors Improving Workplace Safety**

Okun, Guerin, and Schulte (2016) identified workplace health and safety as one significant factor in work-related injuries and fatalities in high-risk industries. Hofmann et al. (2017) explained workplace safety and health refers to the actions of managers to prevent work-related injuries and health hazards. Workplace health and safety is the reduction of employee occupational hazard exposures to further risk, hazard exposure, and hazard mitigation resources associated with workplace injuries (Lay et al., 2017). The primary focus of workplace safety for organizations is to improve on factors leading to workplace accidents (Hofmann et al., 2017; Lay et al., 2017; Taylor, 2015). The implementation of SMSCM to improve safety policies and measures in the workplace could benefit organizational resources.

Taylor (2015) stated areas remain within an organization regarding the improvement of safety in the workplace. Kaynak, Alci, Toklu, and Toklu (2016) explored the specific aspects of factors improving workplace safety in some organizations such as what causes workplace accidents. Menger et al. (2016) stressed organizational managers encountering increased rates of injuries and illnesses are in urgent need of safety training to promote safe practices among their workers. Menger et al. (2016) pointed out specific

strategies for effectively tailoring health and safety training for workers. The specific strategies include themes as understanding the workers, safety training content, safety training methods, maximizing worker participation, and evaluation of the results from the safety training (Menger et al., 2016).

**OSHA training.** Koehn and Datta (2003) found safety management systems are new approaches to outlining environmental health and safety rules and regulations compared to the old approach, OSHA, which outlined measures in controlling safety policies and procedures. Taylor (2015) found an essential factor for improving safety in the workplace was by employees and managers taking a 10 to 30-hour OSHA training course. Taylor (2015) highlighted how the positive impact of safety knowledge improvement and the workers' safety behavior could affect a worker's safety performance. Kaynak et al. (2016) found that safety management systems combined with the workers' safety behavior and safety practices could impact the organizational commitment and workplace safety.

Schulte et al. (2015) added that managers are responsible for a safe and healthy workplace and the employee is responsible for following appropriate rules and practices established by the organization. Schulte et al. (2015) discovered creating an environment for a safe and productive workplace starts at the strategy level. Jitwasinkul, et al. (2016) asserted improved factors in the workplace could ensure worker confidence regarding safety in the workplace. Safety management, safety officers, and practitioners in organizations with the objective to enhance OSHA's guidelines could benefit from a safe and healthy workplace. Kaynak et al. (2016) claimed safety knowledge could positively

impact the organizational commitment and workplace safety based on safety procedures and risk management, safety and health rules, first aid support and training, and organizational safety support.

**Safety climate.** Griffin and Curcuruto (2016) discovered a crucial factor in reducing accidents and promoting a safe work environment in high-risk industries is safety climate. Kim, Park, Lim, and Cho (2017) suggested promoting a safe work environment and contended that safety climate was the fundamental psychological perception employees shared on safety. Kouabenan, Ngueutsa, and Mbaye (2015) supported the findings of Griffin and Curcuruto (2016) and by understanding employee perceptions of risks promoted employee safety awareness. Wu, Song, Wang, and Fang (2015) stated the above factors emphasized the value and importance of safety climate, which employees could prioritize the degree of safety comparisons to other competing priorities. Oah, Na, and Moon (2018) revealed an organization's safety climate was a negative influence on employee cognitive and emotional risk perceptions. Griffin and Curcuruto (2016) unveiled a positive relationship between safety climate and safety outcomes. Guo, Yiu, and González (2016) ascertained that the safety climate is a link to safety outcomes, such as organizational change and innovation. The process of improving safety climate is involvement of quality improvement and efficiency (Guo et al., 2016). The combination of quality improvement with efforts to promote a safety climate could assist employees in the improvement of quality and efficiency of organizations (Kristensen et al., 2015). Organizational managers could use safety climate within

organizations to gain in-depth knowledge regarding the factors that link to safety outcomes.

Heinrich (1959) explained the worker's fault could be associated with other factors in sequence. Awal and Hasegawa (2017) claimed undesirable personality traits are inherited or are developed from a person's social environment and both inheritance and environment contribute to the faults of a person. Considering the social environment as the first domino with respect to SMSCM, the model could be a reference to the safety climate factor in eliminating safety hazards in the workplace. Hughes et al. (2015) found safety management systems contribute to eliminating unsafe acts and conditions that cause accidents. Enhancing the safety climate in the workplace could aid in the elimination of unsafe conditions and or incidents resulting from unsafe acts in the workplace (Lay et al., 2017).

**Safety behaviors.** Jazayeri and Dadi (2017) stated that an organization operating with an effective safety management system could focus on employee safety performance measurements and the influence of employee behavior through safety management. Seo, Lee, Kim, and Jee (2015) identified employee safety behaviors as the components of accidents and injuries. Karatepe (2015) defined safety behavior as the degree to which managerial actions on safety incidents affect the production of a business. Kaynak et al. (2016) discovered that safety behaviors were a result of different occupational health and safety practices, such as organizational safety support. Lyu, Hon, Chan, Wong, and Javed (2018) distinguished safety behaviors as the behaviors of employees causing damage to employee performance and organizational commitment. Guo et al. (2016) identified

unsafe behaviors as components of accidents and injuries in the workplace resulting in personal, social, and financial costs. Guo et al. (2016) highlighted two components in understanding the division of safety behaviors as safety compliance and safety motivation. Safety compliance is the mandated procedure to maintain safety (Pilbeam, Doherty, Davidson, & Denyer, 2016). Safety motivation is an individual's willingness to exert effort to enact safety behaviors and components associated with the behaviors (Neal & Griffin, 2006).

Shin et al. (2015) declared that safety behaviors are a nonfactor to workplace safety but assist in the development of a safety-supporting environment. Mashi, Subramaniama, and Johari (2016) explored how employee involvement in safety behaviors had an impact on safety training through safety procedures. Employees expressed the concept of safety behaviors as adhering to safety procedures to achieve the desired security objectives (Mashi et al., 2016). Employee safety behaviors could increase perception of rational reactions and threats to personal safety (Blakey & Abramowitz, 2016). One fundamental concern was safety training and linking worker involvement in accidents. (Blakey & Abramowitz, 2016). Safety behaviors are the product of social exchange highlighting the importance of supporting the overall health of the workforce (Reader, Mearns, Lopes, & Kuha, 2016). The focus on promoting positive safety behaviors within stable work environments and processes could influence positive employee behaviors, enhance employees' capabilities, and improve employees' performance (Reader et al., 2016; Tsai, Horng, Liu, & Hu, 2015). Researchers could gain

an understanding of organizational safety research relating to safety behaviors and its correlation to increasing safety.

Probst (2015) argued that the concept of safety motivation is an important aspect of organizational managers and safety officers. Hedlund, Gummesson, Rydell, and Andresson (2015) noted that safety motivation is the individual willingness to dedicate efforts to enact safety behaviors. Alarcón, Acuña, Diethelm, and Pellicer (2016) defined safety performance as a result of how motivated individual employees were to perform at their current state of behavior. Haas and Hoebbel (2018) asserted in high-risk industries by understanding employee perceptions, managers were provided a forecast of what to expect from employee motivation. Employee motivation improved as employee accidents declined (Hedlund et al., 2015). The influence of safety motivation on safety behaviors is in direct relation to safety outcomes (Kark, Katz-Navon, & Delegach, 2015). Pordanjani and Ebrahimi (2015) posited safety motivation has a connection to the fluctuation of occupational accident rates. Pordanjani and Ebrahimi (2015) affirmed that employees used scientific principles and procedures to reduce and prevent occupational accident rates based on organizational desired level of safety motivation. Pordanjani and Ebrahimi (2015) argued that safety motivation is a factor why managers comply with safety procedures. Alarcón et al. (2016) agreed that safety motivation is crucial for improving safety behaviors in the workplace and affects employee safety performance. Organizational managers and safety practitioners could use safety motivation to focus on improving safety behaviors in the workplace (Pordanjani & Ebrahimi, 2015).

In reference to the SMSCM framework, Mohammadfam, Ghasemi, Kalatpour, and Moghimbeigi (2017) stated that improving safety behaviors is vital for enhancing safety levels in the workplace. Identification and addressing undesirable personality traits of an individual, act as a component to enhancing safety (Awal & Hasegawa, 2017). Shappell et al. (2007) found that Heinrich's SMSCM supports safety initiatives targeted towards correcting hazardous behaviors given the main premise is that unsafe acts and conditions cause safety accidents in the workplace. Jazayeri and Dadi (2017) noted researchers could gain an understanding of how improving unsafe behavior related to employee health and safety and correlated to increasing safety behaviors.

**Safety compliance.** Kvalheim and Dahl (2016) discovered the significance of safety violations as a factor in industrial occupational accidents or injuries. Toole, Gambatese, and Abowitz (2016) inquired about each element under federal, state, and OSHA regulations that dictated respective responsibilities of safety and health. Safety compliance is the enforcement of core safety tasks to maintain employee safety (Kvalheim & Dahl, 2016). Lewis (2016) affirmed that OSHA created a law governing workplace safety and providing managerial responsibility for creating a safe and healthy workplace. Organizational managers were responsible for decisions in the prevention of health and safety hazards by employees (Subramaniam, Mohd Shamsudin, Mohd Zin, Sri Ramalu, & Hassan, 2016; Takala et al., 2017; Thompson, 2016). Berkowitz and Hedayati (2017) claimed that organizational managers under an OSHA-approved plan are required by law to report each accident or injury. Ahn, Kim, Corley, and Scheufele (2016) questioned if federal, state, and OSHA regulatory guidelines and policies stating the cost

of regulations had a direct impact on increasing employee safety and health. Kemparaj, Panchmal, Jayakumar, and Kadalur (2016) emphasized the potential for ethical issues to occur when considering OSHA regulatory guidelines and policies. North Carolina has an OSHA-approved plan for accidents and injuries for domestic and international use (Berkowitz & Hedayati, 2017). Implementing SMSCM could provide empirical knowledge in underlining the importance of safety compliance and its role in increasing safety in the workplace. Use of SMSCM could contribute to more knowledge in the field of OSHA regulatory guidelines and policies wherein safety protocols are in place to ensure increased safety in the workplace (Kemparaj et al., 2016).

Managers who implement safety programs reduce accident rates when required to create safety compliance for the employee workforce (Bavafa, Mahdiyar, & Marsono, 2018). Managers using safety programs under OSHA could prevent and control hazards and the associated costs in the workplace (Chinniah, 2015). Burk and Hendry (2014) found most organizational managers enforced and implemented safety programs to meet regulatory requirements to protect employees. Burk and Hendry (2014) indicated the protection of employees from safety incidents is an expensive business problem. Tappura, Sievänen, Heikkilä, Jussila, and Nenonen (2015) contended safety programs are one focus, which affects organizational safety performance and financial loss. Organizational safety performance is the leading indicator in the identification and correction of deficiencies before triggering injuries and illnesses (Sinelnikov, Inouye, & Kerper, 2015). Moussu and Ohana (2016) stated safety programs were consistent programs, which could enhance organizational profitability. Howton et al. (2016) implied

that managers of organizations required specific training materials to select the recommended safety program based on the needs of the organization. Campione and Famolaro (2018) discovered safety practices for improving the culture of safety in an organization included implementing action plans, quality improvement, and safety initiatives and programs. Bavafa et al. (2018) identified the prevention of unacceptable behavior, detection of improper behavior, and obtaining proper documentation of accidents as the objectives for safety compliance. Bavafa et al. (2018) found inexperienced employees of industrial sectors in developing countries affected the implementation of safety programs in industrial sectors. Implementing SMSCM could underscore the need for safety initiatives and programs for organizational managers and employees. Bavafa et al. recommended firms address the issue of safety by providing more opportunities for managers emphasizing the need for safety programs.

Hanaysha (2016) stated SMSCM is essential to increasing safety in the workplace because safety compliance is crucial to determining and ascertaining the components of accidents. Hanaysha concluded that improving workplace safety strategies are useful tools in sustaining an organization's competitive advantage regarding new processes such as tracking, monitoring, and ensuring safety compliance. Guo et al. (2016) found that SMSCM could act as referential guidance in providing justification to safety compliance procedures. Leveson (2015) contended that organizational managers could identify safety hazards before accidents occur using safety compliance actions and safety management techniques. Heinrich (1959) and Pillay (2015) revealed accidents occur in five phases consisting of (a) management system of standards and guidelines to prevent unsafe acts,

(b) human behaviors and human errors, (c) ergonomics, (d) organizational and cultural factors, and (e) organizational safety on safety management strategies. Safety compliance procedural controls in place in each phase could prevent accidents from taking place in the workplace, reducing overall safety hazards and incidents (Pillay, 2015).

**Safety knowledge.** Safety knowledge is one of the factors influencing safety in the workplace (Webb & Morancie, 2015). Safety knowledge is especially vital to address as part of organizational learning to enhance safety in the workplace. Cechini, Bedini, Mosetti, Marino, and Stasi (2018) acknowledged safety knowledge is a factor impeding safety performance and safety outcomes of an organization. The discovery of safety knowledge has an association with safety climate, safety behavior, and outcomes affecting health and injury risks (Liu et al., 2015). The value of safety knowledge in an organization affects employee behavior, based on occupational safety and health laws of the United States (Dragano et al., 2015). Employees with a lack of safety knowledge were at greater risk of accidents in the workplace based on failure to comply with the safety rules and regulations (Toppazzini & Wiener, 2017). After safety training, employees were more aware of safety knowledge than safety behavior (Feng, Bruhn, & Marx, 2016). Organizational managers had no desire to change safety practices using increased safety knowledge (Feng et al., 2016). Managers had to become consistent system thinkers and learners to improve the quality and efficiency of the organization's system by implementing organizational learning (Hoyme, 2015).

Fang, Wu, and Wu (2015) specified that employees enhanced safety knowledge and skills by recognizing supervisor expectations, which improved employees behavioral

decisions. Employees acquired safety knowledge through safety training and education to increase their knowledge and awareness, regarding health and safety to improve safety practices (Webb & Morancie, 2015). Understanding how an organization's employees acquired and disseminated new knowledge might increase safety awareness within the organization and reduce accidents (Stubbé, Van Emmerik, & Kerstholt, 2017). The use of safety knowledge for trainers and in training / safety programs assisted employees in identifying potential safety hazards (Liepė & Sakalas, 2015). With SMSCM as the guiding framework, the factor of safety knowledge correlates strongly to the success of safety initiatives and strategies in the workplace. Heinrich (1959) explained that individuals commit dangerous acts due to a lack of knowledge or skill. Cechini et al. (2018) argued that lack of safety knowledge is a factor impeding safety performance and safety outcomes of an organization, which increases unsafe behaviors in the workplace. Cechini et al. (2018) stated increasing and focusing on enhancing safety knowledge by identifying unsafe behaviors in the workplace could have a positive impact on attaining safety in the workplace.

**Safety management.** Feng et al. (2015) stated managers assumed the responsibility of recruiting and hiring skilled and capable employees. Hassan (2016) and Rafii and Andri (2015) explained that the challenge for managers is to foster an accident-free environment. Feng et al. (2015) stated SMSCM could provide empirical information to organizational managers to increase safety levels within organizations and to reduce workplace accidents. Reichelt and Haas (2015) and Singh, James, and Ganguli (2018) indicated that managers might reimburse new employees for expenses such as relocation

costs. Reichelt and Haas (2015) revealed that some managers neglected the management and understanding of the needs of chronically ill workers. Singh et al. (2018) specified that employees with a chronic illness often reduced the workforce as their absenteeism caused a reduction in profitability, revenue, financial growth, and organizational performance. Singh et al. (2018) clarified that managers received negative effects from the departure or resignation of chronically ill employees, which contributed to higher employee turnover rates. Managers should target proactive safety measures and programs within organizations to ensure the safety needs are addressed (Singh et al., 2018).

De Cordova, Bradford, and Stone (2016) and Srinivasan, Ikuma, Shakouri, Nahmens, and Harvey (2016) delved into the topic of reducing workplace accidents and discovered that managerial lack of training on health and safety initiatives was a contributing factor to increased accidents. Taufek, Zulkifle, and Kadir (2016) determined lack of safety awareness is an area of improvement to ensure the safety of employees. Bailey, Madden, Alfes, and Fletcher (2017) mentioned that improvements to ensure the safety of employees enhanced the organization's financial performance and employee accident rates. Pekovic (2015) distinguished between two indicators for management practices as quality and environmental practices. Pekovic (2015) discovered that managers using environmental practices experienced a reduction in workplace accidents. Sharma and Sharma (2015) found safety management focused strategies impact employee abilities to acquire knowledge, skills, and capabilities to increase organizational performance. Sharma and Sharma (2015) explained that various trends over the years and practices used across industries improve employee commitment.

Tappura et al. (2015) claimed safe working conditions are imperative for the survival of an organization. Managers create an environment of learning based on effective practices used to reduce workplace accidents for the organization (Tappura et al., 2015). Safety practices could impact an employee's abilities to acquire the knowledge, skills, and capabilities to increase organizational performance (Sharma & Sharma, 2015).

Hughes et al. (2015) found workplace environments are complex and multifaceted, which is key in contributing to the safety levels of workplace environments. Li et al. (2017) revealed SMSCM could provide an explanation of the occurrence of workplace accidents. Safety management is pertinent to understand and address the occurrence of workplace accidents, resulting in the mitigation and elimination of hazardous incidents. SMSCM's premise is that safety management is key in advocating and promoting safety culture in the workplace (Berta et al., 2015).

**Safety training.** The influence of Heinrich's (1959) SMSCM prompted organizational managers to promote workplace safety training and increase safety awareness (Hughes et al., 2015). To enhance safety knowledge and safety behaviors in the workplace, safety training is highly crucial for organizations (Liu et al., 2015). The significant importance of safety training for employees is to ensure the overall safety of employees in the workplace (Jonathan & Mbogo, 2016). Training programs are important in equipping employees with the required safety skills to promote a safer and healthier workplace (Jonathan & Mbogo, 2016). The research on the importance of safety training for employees is beyond the scope of the United States and provides valuable insights into the multicultural and diverse training (Fujimoto & EJ Härtel, 2017).

Heinrich (1959) included formal and informal training for employees. Kim et al. (2017) provided the results of an investigation demonstrating government policies on safety training reduced the rate of occupational injuries. Kim et al. (2017) asserted managers are responsible to ensure workers are knowledgeable regarding rules and regulations governing safety in the workplace, and the workers are responsible for adhering to the guidelines to assist in preventing workplace accidents. Huang et al. (2016) noted the impact of safety training outcomes required further investigation. Searcy, Dixon, and Neumann (2016) explored specific safety objectives from the inconsistent research on the general impact of safety training in the workplace. Menger et al. (2016) identified the need to establish cultural training to promote safe practices among employees from the fluctuating rates of injuries and illnesses. Menger et al. (2016) specified strategies on how to tailor health and safety training for immigrants. The strategies included themes such as understanding workers, training content, training methods, maximizing engagement, and evaluating the results (Menger et al., 2016).

Wold and Laumann (2015) argued that top level management should create safety management systems to train their employees. Wold and Laumann (2015) stated that employees often receive, interpret, or understand safety training differently. Jonathan and Mbogo (2016) implied that the lack of safety skills affected employee preparedness in matters pertaining to reducing the levels of occupational accidents and disease. Jonathan and Mbogo (2016) noted the possibility to observe more intense and obligatory training to ensure the safety of the workplace while considering important factors contributing to workplace accidents. Kouabenan et al. (2015) and Griffin and Curcuruto (2016) aimed to

understand employee perceptions of risks and employee safety awareness. Kouabenan et al. (2015) and Griffin and Curcuruto (2016) concluded safety climate is a highly crucial component in reducing accidents and promoting a safe work environment in high-risk industries. Jonathan and Mbogo (2016) explained how managers could learn from prior ineffective safety training to improve teaching of safety skills. Jonathan and Mbogo (2016) observed the importance of training appeared after discovering no involvement of staff in safety training programs.

Namian, Albert, Zuluaga, and Jaselskis (2016) suggested the lack of safety training affected the preparedness of individuals on matters of health hazards and overall organizational performance. Shendell, Milich, Apostolico, Patti, and Kelly (2017) reported OSHA training, a standardized 10-hour training course, is a mandated requirement for safety training. Comparing the investigation of the training course with research of others, Chughtai (2015) highlighted the positive impact of training on safety knowledge and safer workplace behaviors. Research on SMSCM could provide more evidence that safety training is highly crucial in order to make a significant positive impact on safety within organizations (Leveson, 2015). The importance of using SMSCM is achieving safety training initiatives and goals to increase safety in the workplace (Leveson, 2015). Organizational managers should consider the environment or workplace setting when assessing and determining how to enhance levels of safety training (Berta et al., 2015). Safety training could be able to incorporate the explanation of accident occurrences in a sequence of events related to individual faults and undesirable personality traits (Awal & Hasegawa, 2017).

## Transition

In Section 1, I provided (a) background of the problem, (b) problem statement, (c) purpose statement, (d) nature of the study, (e) research question, (f) conceptual framework, (g) operational definitions, (h) assumptions, limitations, and delimitations, (i) significance of the study, and (j) review of the professional and academic literature. In Section 2, I discussed the (a) role of the researcher, (b) qualitative research design, (c) case study method, (d) population and sampling, (e) ethical research, (f) reliability and validity, (g) data collection, (h) data organization technique, and (i) data analysis. In Section 3, my aim was to (a) present my findings, (b) discuss my findings application to professional practice, (c) list implications for social change, (d) offer recommendations for action, (e) propose recommendations for further research, (f) provide my reflections, and (g) close with a conclusion. I discussed the implications of social change, provided suggestions for future research, addressed a deficit in business practice, and offered strategies relevant to managers' practices used for improving workplace safety within an organization.

Section 2: The Project

## Purpose Statement

The purpose of this qualitative single case study was to explore strategies some organizational managers use to reduce workplace accidents. The target population for the study was six managers who oversaw safety issues at one organization in the central region of North Carolina who have developed strategies to reduce workplace accidents. The implication for positive social change included benefitting local residents through enhanced stability of communities with increased employment opportunities that would enable residents to increase their contributions to community betterment to sustain a safe working environment to enhance a safer community.

## Role of the Researcher

I served as the primary data collection instrument and conducted research in the central region of North Carolina. My role was to use semistructured interviews; conduct data analysis; review the company's documents such as manuals, policy documents, company reports, procedure guides, and strategy documents to triangulate data and to reinforce the evidence collected from the interviews; conduct member checking; and develop themes to answer my research question. Bahrami, Soleimani, Yaghoabzodeh, and Ranjbar (2016) claimed the role of the researcher was to collect valid and reliable data to answer the overarching research question in a study. Before conducting data analysis and collecting data, my duties included recruiting potential participants and obtaining institutional review board (IRB) approval from Walden University. The IRB approval number for this study was 08-23-19-0662688. I selected six possible

participants from the potential participants willing to participate based on the invitation to participate (see Appendix B). I collected data from participant interview sessions related to their experiences and in-depth understanding of strategies some organizational managers use to reduce workplace accidents. Mcknight (2018) suggested focusing on study participants as the main priority to gain an in-depth understanding of the effective safety strategies in the workplace.

A former coworker witnessed a workplace accident after 3 months of employment, which inspired me to explore workplace safety. Within 3 months employed as an organizational manager, my coworker experienced an employee fatality in the workplace from the employee's lack of equipment training and safety training. After my coworker considered resigning after only 3 months of employment, I realized that workplace safety is a major concern, and it motivated me to explore the phenomenon in this study. I had no previous experiences with the organizational managers or with the study participants.

The *Belmont Report* contains three ethical principles of research used to avoid and resolve ethical problems in respect for persons, beneficence, and justice (U.S. Department of Health & Human Services, 2016). The *Belmont Report's* distinction between practice and research is the guiding principle regarding informed consent for persons, beneficence underlining risk-benefit analyses, and the central principle behind the subject selection for justice (McGregor, Hensel, Waltz, Molnar, & Ott, 2017). The principle of respect for persons is essential as the researcher recognizes participants are autonomous and that participants with diminished autonomy need protection (U.S.

Department of Health & Human Services, 2016). In exercising the principle of beneficence, I treated the participants in an ethical manner by respecting and ensuring their well-being through protection from harm. The enforcement of the principle of justice is a representation of equality and nonexistent favoritism when interacting with each participant (U.S. Department of Health & Human Services, 2016).

I remained aware of my personal beliefs and biases regarding improving workplace safety before the participant interview process and throughout the data analysis process. My aim was to remain objective and be mindful and self-reflective of my biases. Researcher bias refers to the inability to separate oneself from the research (Henriksen, Polonyi, Bornsheuer-Boswell, Greger, & Watts, 2015). I recognized that bias exists, and I set aside preconceived ideas about the research, was open to contrary evidence, and ensured that the conclusion of my study reflected the findings. I ensured data saturation to help mitigate bias and avoid viewing data through a personal lens or perspective.

I used an interview protocol with open-ended interview questions (see Appendix A). I used an interview protocol that includes explaining the informed consent form, talking about oneself, providing researcher contact information, and informing participants of a second meeting to perform member checking. Qualitative researchers use an interview protocol and member checking to separate perspectives, personal experiences, and belief from the collected data (Alase, 2017; Moshabela, Sips, & Barten, 2015). Member checking is a technique for comparing the accuracy of researcher interpreted data or analyzed data to the participant for validation (Birt, Scott, Cavers,

Campbell, & Walter, 2016). I met with the six participants individually for the member checking follow-up appointment on another scheduled day. During the follow-up appointment, each participant reviewed my interpretations to ensure the responses were an accurate representation of their experiences. An interview protocol is a procedural guide for qualitative researchers to use during the interview process (Kallio, Pietilä, Johnson, & Kangasniemi, 2016). Researchers use an interview protocol as a guide to ensure procedures and general rules concerning conducting research are followed (Yin, 2018). An interview protocol could enhance the quality of data collection, validity, and reliability of the study (Castillo-Montoya, 2016; Dikko, 2016).

## Participants

Wilson et al. (2018) identified study criteria for researchers selecting participants by relying on an outline of qualifications and characteristics. Greiner (2015) suggested selecting study participants based on study criteria from a population of participants. I recruited my participants based on my study criteria of those who have developed strategies to reduce workplace accidents. I selected my population using purposive sampling. Participants in this study met the following eligibility criteria: (a) having been a manager for 12 months or longer in an industry, (b) having been a full-time employee with the organization, (c) having developed strategies to reduce workplace accidents, and (d) working at a company located in the central region of North Carolina.

Nkansah and Chimbwanda (2016) identified gaining access to participants as critical factors in promoting a positive research process. Cheung, Bartlett, Armour, Laba, and Saini (2018) and Dobbins (1996) suggested beginning the initial participant

recruitment process early to ensure adequate time to capture the diversity of participant experiences and build professional relationships before the individual interviews. Before IRB approval, I searched and created a list of potential organizations located in the central region of North Carolina from the local Chamber of Commerce directory online at www.faybiz.com. By using the map feature at the faybiz.com website, I visited potential organizations in person or by contacting the list of potential organizations by phone. After making contact, I spoke to organizational managers from potential organizations until I located one organizational manager who was willing to sign a letter of cooperation (see Appendix C) and who could provide me with a list of potential study participants. After obtaining IRB approval and after I receive a signed letter of cooperation from the potential organization, I requested a list of potential participants from the manager along with email addresses and direct phone numbers of participants who met the eligibility criteria. From the list of potential participants, I selected six participants and emailed invitations to participate (see Appendix C) along with informed consent forms to each individual explaining the purpose of the research. After receiving the signed informed consent form from the study participants, I contacted the selected organization and the organizational manager of the organization via email or telephone to schedule a face-to-face appointment with the potential participants. During the face-to-face appointment, I discussed the study in detail, formalized the research process, and obtained a verbal intent to participate agreement.

Purposive sampling and snowball sampling are two strategies to select participants for a study (Robinson, 2014). Purposive sampling is a technique used to

select participants who have the expertise relevant to the research topic (Etikan, Musa, & Alkassim, 2015). I used purposive sampling in identifying six potential participants meeting the study criteria to obtain quality data. A second recruitment strategy is snowball sampling. Snowball sampling, or chain-referral method, is for hard-to-reach populations not readily accessible to outsiders (Palinkas et al., 2015; Wohl et al., 2017). Snowball sampling is the recommendation of acquaintances who might qualify for participation leading to referral chains (Rosenthal, 2016). I used snowball sampling and purposive sampling to obtain the number of participants required to conduct my research.

Each participant had the option to participate by signing and returning the informed consent form to me. I explained via email the selection criteria for inclusion in the study enabling eligible participants the opportunity to decide whether to voluntarily engage in the study. I selected six participants from the list of potential participants willing to participate based on the invitation (see Appendix B). Von Thiele Schwarz et al. (2016) and Wiser (2018) stated researchers have a responsibility to maintain a professional relationship throughout the research process. I spoke with each selected participant on the phone and confirmed their knowledge of the topic and eligibility criteria aligned with my overarching research question. To qualify for the study, participants needed to meet the eligibility criteria of the study and have the background and experience to answer the interview questions. To ensure a successful interview session, I informed the selected participants of my expectations regarding the study before the interview process using the interview protocol (see Appendix A). During the

interview session, the study participants were cooperative, spoke openly about their experiences, and answered all the interview questions.

I used trust as the primary strategy to establish a working relationship with participants. To establish and maintain a working relationship throughout the research process, Kallio et al. (2016) recommended establishing and retaining a level of trust with the study participants. Building and maintaining trust is an important step in establishing a relationship when conducting the interview process with participants (Birchall, 2014; Quinney, Dwyer, & Chapman, 2016). To establish trust and rapport with the participants, I obtained written informed consent and emphasized to participants that their participation was voluntary, and they could withdraw from the study at any time without consequence. To garner trust with the study participants, I set up the interview times, dates, and location based on each participant's approval after IRB granted permission to conduct the data collection.

A second strategy I used to establish a working relationship with participants was professionalism. To ensure professionalism, Luther, Snook, Barron, and Lamb (2015) suggested maximizing the effectiveness of the interview by checking for poor sound quality and poor acoustics of the room, testing and preparing the recording equipment before the interviews, and ensuring the rules of communication were transparent between the participant and the researcher. Doody and Doody (2015) found scheduling time to conduct interviews places constraints on the capacity of completing the interviewing session. I scheduled an hour timeframe during the workweek for each semistructured

interview and extended the interview time if necessary. Participation was voluntary for the participants and I asked each participant five interview questions.

Petrova, Dewing, and Camilleri (2016) and Xu, Cenfetelli, and Aquino (2016) stated that researchers should provide confidentiality to their participants. I informed the participants there was no obligation to participate and they could withdraw at any stage of the interview process without consequence. To ensure the privacy and confidentiality of the participants, I used identification codes such as P1 and O1 to maintain participant and organization confidentiality. Before interviewing the participants, I sent the consent form via email to the participants. I protected the confidentiality of the organization and participants by storing the data, informing the participants of their rights, and properly destroying the collected data regarding the study.

## Research Method and Design

### Research Method

The three methods of research are qualitative, quantitative, and mixed methods. Qualitative researchers seek to gain an understanding of an individual's attitudes, opinions, or beliefs about a phenomenon (Percy, Kostere, & Kostere, 2015; Yin, 2018). Qualitative researchers investigate subjective experiences through the perspective of participants; raising additional issues through broad and open-ended questions; and, understanding behaviors related to values, beliefs, and assumptions (Almurshidi & Naser, 2017; Tonetto & Desmet, 2016). I selected a qualitative research method to gain an in-depth understanding of how some managers use strategies to reduce workplace accidents. Dempsey, Dowling, Larkin, and Murphy (2016) explained that the qualitative method

provides an opportunity for researchers to focus on the phenomenon when planning and conducting qualitative interviews. Haas and Hoebbel (2018) ascertained the qualitative research method involves the understanding of individual perceptions and insight on a phenomenon. Researchers use the qualitative research method to focus on *what*, *why*, and *how* questions to gain an understanding of the phenomenon being studied (Tonetto & Desmet, 2016).

Babones (2015) stated that researchers use the quantitative method to measure variables and test hypotheses. Onen (2016) asserted that quantitative researchers use statistical data to test a theory or examine causal interactions. Researchers use the quantitative method to determine the relationship between data variables in research (Makrakis & Kostoulas-Makrakis, 2016). The quantitative research method was not appropriate for my study as measuring variables and testing hypotheses would not have helped me address the research question.

The mixed method is most useful when one method does not provide a complete understanding of the study (Kukla et al., 2015). Researchers use mixed methods to gather data through quantitative and qualitative designs concurrently or sequentially (McKim, 2017; Ramlo, 2016). I did not need to gather data through the quantitative aspect of mixed methods to address my specific business problem; the mixed method approach was not appropriate for my study.

**Research Design**

Case study, ethnography, and phenomenological designs are three research designs I considered for this study. In a case study, a researcher explores an in-depth

program, event, activity, or process (Dumez, 2015). A case study has a defined time frame and is bounded by place (Fusch & Ness, 2017). Case study researchers attempt to learn more about a little known or poorly understood situation (Mills, Harrison, Franklin, & Birks, 2017). The structure of a case study should be the problem, the context, the issues, and the lessons learned (Neale, Thapa, & Boyce, 2006). Researchers use case study designs to make inquiries concerning an event, activity, group, or individual using a variety of data collection procedures (Yin, 2018). A case study was appropriate for this study since my focus was to explore an in-depth situation of a phenomenon bounded by time and place.

Draper (2015) discovered that researchers use ethnographic design to explore the process and product of describing cultural behavior. Morgan, Pullon, and McKinlay (2015) noted that ethnography involves extended exploration of a group culture. Ethnographic design was not applicable to the current study as the focus of my study was not based on cultural norms and behaviors or an extended exploration of groups' culture.

The focus of phenomenological research is to seek reality from individuals' lived experiences and feelings to produce in-depth descriptions of the phenomenon as the researcher attempts to understand the essence of the experience (Yüksel & Yildirim, 2015). Phenomenological researchers are in search of the underlying meaning of the experience and emphasize the intentionality of consciousness where experiences contain outward appearance and inward consciousness (Matua & Van Der Wal, 2015; VanScoy & Evenstad, 2015). The phenomenological approach was not appropriate for my study as

the focus of my study was not to explore individuals' lived experiences and perspectives regarding a concept or a phenomenon.

## Population and Sampling

The participants were six individuals who provided specific perspectives and experiences to answer the research question. Roy, Zvonkovic, Goldberg, Sharp, and LaRossa (2015) suggested practical guidance for determining sample sizes to conduct rigorous qualitative research. Case study sample size is satisfactory when further data collection yield repeated data (Trotter II, 2012). Marshall, Cardon, Poddar, and Fontenot (2013) found sample size is dependent upon the needs of the researcher. Galvin (2015) and Boddy (2016) argued 15 to 30 interviews in qualitative studies is the adequate number required for reliable results. Based on methodological considerations and previous single case studies, researchers recommended a sample size of 4 to 30 participants (Sim, Saunders, Waterfield, & Kingstone, 2018). I used a sample size of six participants for this case study from an organization in the central region of North Carolina.

Purposive sampling and snowball sampling are two strategies to select participants for a study (Robinson, 2014). Purposive sampling is a technique used to select participants who have the expertise relevant to the research topic of study (Etikan et al., 2015). The process of using purposive sampling allowed for the proper selection of knowledgeable participants suitable for my study (Van Hoeven, Janssen, Roes, & Koffijberg, 2015). Purposive sampling is selecting participants based on the study criteria, richness and relevance of information, and appropriate knowledge, experience,

and skills of the study participants (Gentles, Charles, Ploeg, & McKibbon, 2015; Yin, 2018). Purposive sampling is a popular choice for qualitative researchers to consider when selecting targeted participants for data collection (Palinkas et al., 2015). I selected six managers from one organization in the central region of North Carolina who had the requisite knowledge and skills to inform the research question and who met the additional eligibility criteria. Participants in this study met the following eligibility criteria: (a) having been a manager for 12 months or longer in an industry, (b) having been a full-time employee with the organization, (c) having developed strategies to reduce workplace accidents, and (d) working at a company located in the central region of North Carolina.

A second recruitment strategy is snowball sampling. Snowball sampling, or chain-referral method, is for hard-to-reach populations not readily accessible to outsiders (Palinkas et al., 2015; Wohl et al., 2017). Snowball sampling is the recommendation of acquaintances who might qualify for participation leading to referral chains (Rosenthal, 2016). I used snowball sampling and purposive sampling to obtain the number of participants required to conduct my research.

The data saturation process involves the identification of themes, thematic definitions, categories, and coding based on participant responses (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). Data saturation occurs when a researcher fails to identify any new themes, categories, insights, or perspectives for coding from each additional interview (Fusch & Ness, 2015; Kline, 2017). Data saturation in a single case study is achieved when no discovery of new evidence or information exists (Boddy, 2016; Kline, 2017). Researchers improve the probability of achieving data saturation with a smaller

sample size (Hammarberg, Kirkman, & De Lacey, 2016; Harf et al., 2015). Qualitative researchers could reach data saturation with fewer than six participants (Guest, Bunce, & Johnson, 2006). I interviewed six participants. I reviewed the participant responses and reviewed organizational documents until no new information was present. I reviewed organizational documents, which included the organization's emergency plan, worker safety surveys, safety memorandums, and the incident logs and reports to back up and provide clarity to the participant interviews.

## Ethical Research

Before beginning the interview process, I obtained permission from Walden University's IRB. Grady et al. (2017) explained the IRB is the research ethics committee responsible for protecting and overseeing the ethical standards for individuals participating in human subject research. I understood I could not visit the study organization and interview employees without receiving permission from an official in the organization. I had an email address specifically for communication between the selected participant within the organization and myself (workplacesafety2018@gmail.com). The introductory email had the informed consent form attached and included the willingness to participate with the option to discontinue as a participant at any time. Informed consent means informing the participants of their right to confidentiality, their right to withdraw from a research study, and any incentives for participation in the study (Grady et al., 2017). In the consent form, I explained the purpose and nature of the study, procedures, associated risks and benefits, participant privacy, freedom to withdraw from the study at any time, my contact information for

further question. Potential study participants needed to sign the consent form confirming their willingness to participate in the study and were free to ask any questions pertaining to the study before I proceeded with the interview. The potential study participants signed the informed consent form and I obtained a copy by email with the consent signature.

Crow, Wiles, Heath, and Charles (2006) stated participants have the right to withdraw from the study without consequences. Participants who chose to withdraw from the study could do so by sending an email, notifying me they no longer wished to participate. None of the participants withdrew during my data collection process, so I did not have to destroy any documents, shred any word files, or erase content from the audio recordings. Giles, Sniehotta, McColl, and Adams (2016) suggested offering participants shopping vouchers as a thank you for taking part in the study, which could broaden participation and increase feedback. Upon completion of the interviews and member checking, I expressed my gratitude towards the participants by giving each participant a $10 Visa gift card for their valuable time and information.

I followed the guidelines of the *Belmont Report* to conduct my research. I understood I might need to obtain approval for documents from community partner organizations such as the data use agreement or letters of cooperation before IRB approval. Johnson et al. (2016) indicated data use agreement outlines appropriate data usage and security standards and forbids efforts to identify individual participants or organizations. A letter of cooperation is a written agreement where a signatory official allows approval to recruit participants, access information, or conduct data collection (Loyola University Chicago Institutional Review Board, 2019). I had the letter of

cooperation signed before data collection began (see Appendix C). Embleton et al. (2015) and Protecting Human Research Participants (2019) insisted a researcher has an obligation to protect the well-being and the rights of the participants and practice the ethical principles of respect of persons, beneficence, and justice. I practiced respect of persons, beneficence, and justice to remain compliant with federal regulations and Walden University's policies.

To limit the probability of distractions, I conducted the semistructured interviews in a conference or interview room. I provided a comfortable setting to ask open-ended questions and for the study participant to respond to the open-ended questions. Kornbluh (2015) posited that ethical issues might surface in aspects of the research process, such as understanding the population, conveying the data analysis process, reconstructing data collection memories, being open to change, comparing themes, and incorporating member checks into the data analysis process. I did not use the participant's personal identifying information or the name of the study organization throughout the study. I assigned identification codes to each participant such as P1 and P2 and an identification code for the organization such as O1. Study participants who volunteered to participate in a study and the selected organization were not mentioned by name in the research (Allred, Findley, Nielson, & Sharman, 2017). To ensure the ethical protection of the study participants and organization, Baker, Loade, and Crone (2015) suggested securing and storing research data in an electronic format under password-protected files and in a combination safe maintaining the hard copies of the transcription forms for a period of five years. I stored the research data securely at my residence for 5 years to protect the

confidentiality of participants using the electronic format and a combination safe. After the 5-year timeframe, I will destroy the research documentation and raw data collected by erasing the computer data using the KillDisk software. The IRB approval number for this study was 08-23-19-0662688.

## Data Collection Instruments

In this qualitative single case study, I served as the primary data collection instrument to analyze and collect data (Fusch & Ness, 2015). I mitigated bias by ensuring the integrity of my data collection and analysis process. The focus of my study was to explore strategies some organizational managers use to reduce workplace accidents. Yin (2018) noted mitigating biases by being sensitive to conflicting evidence is a researcher's obligation to participants. Leichsenring et al. (2017) observed that biases might influence participant responses and researcher observations and interpretations. Yin acknowledged other sources could be used as data collection instruments in case study research.

Fusch and Ness (2015) mentioned qualitative data collection instruments could consist of interviews, documents, and direct observations. Yin (2018) stated documents should be the objective of data collection. Morse and McEvoy (2014) claimed direct observations create an opportunity for the researcher to view participants in their actual context and interviews provide explanations and personal views. Dikko (2016) acknowledged the selection of data collection instruments were pivotal in qualitative case studies as data are neither exact nor statistical. Brown, Lui, Robinson, and Boyle (2015)

stated interviews are the preferred method for the data collection on participant experiences and in-depth understanding of the phenomenon.

I used semistructured interviews and company documents as my data collection instruments and an interview protocol as my guide for the interview process. An interview protocol is a tool to guide the structure of the interviews of what the researcher will say before and after the interview, prompting the researcher to collect informed consent from participants, and serves as a procedural guide through the interview process (see Appendix A). Bengtsson (2016) stated qualitative researchers need to approach an interview session with an open mind. I approached the interview session with an open mind.

Kallio et al. (2016) noted semistructured interviews were essential in controlling and mitigating bias in qualitative research. Researchers select a semistructured interview to allow flexibility of the interviewer to improvise their questions based on individual responses and allow the participants versatility in expression and discussion (Kallio et al., 2016). To ensure a successful interview session, I informed the study participants of my expectations before the interview process using the interview protocol (see Appendix A). Some researchers use company documents and archival analysis as a data collection technique to support primary data (Jetzek, 2016). Researchers use existing company records to obtain a better understanding of how the company functions, company culture, company policies, and company changes (Ajagbe, Sholanke, Isiavwe, & Oke, 2015). I reviewed company documents, which included manuals, policy documents, company reports, procedure guides, and strategy documents to triangulate data and to reinforce the

evidence collected from the interviews. I conducted an electronic review of available company websites containing data on the organization's workplace safety initiatives and archival analysis as a data collection technique to support the primary data. Some qualitative researchers use multiple data sources in a case study to enhance the research reliability and validity of a study (Gergen, Josselson, & Freeman, 2015).

Interviews are the most common tool used for data collection in qualitative research (Janghorban, Roudsari, & Taghipour, 2014). Researchers could interview telephonically, via Skype, Facetime, etc. (Nichols, 2018). The most common method for conducting interviews is face-to-face (Mealer & Jones, 2014). Some benefits of face-to-face interviewing for a researcher include capturing a participant's emotions, beliefs, or behaviors; controlling the interview and guiding the participant towards interview completion; and, capturing verbal and non-verbal signals of the participant (Gratch et al., 2014). I conducted face-to-face semistructured interviews with all six of the participants.

To enhance the reliability and validity of the study, I used member checking. Member checking is a method of improving the accuracy of data analysis by contacting the participant for validation (Birt et al., 2016). Through member checking, researchers could acknowledge the use of correct language, verbiage, and word meaning upon completion of the study (Harvey, 2015; Simpson & Quigley, 2016; Thomas, 2017). Researchers restate or summarize information and then question the participants to determine accuracy (Harper & Cole, 2012). The participants either agree or disagree if the summaries reflect their views, feelings, and experiences, and if the participants affirm the accuracy, then the study is deemed to have credibility (Harper & Cole, 2012).

Through member checking, I compared the accuracy of my interpreted data to the participant for validation. Houghton, Murphy, Shaw, and Casey (2015) stated member checking involves the active process of asking the participant if the researcher's description of the interpretations is fair. Member checking also reduces the incidence of incorrect data and misinterpretation of data, with the primary goal of providing trustworthy findings (Houghton et al., 2015).

## Data Collection Technique

I collected data using an interview protocol (see Appendix A) as a guide for asking interview questions. I reviewed the company website for strategies managers use to reduce workplace accidents. Review of the company website allowed for the corroboration of data to assist in validating the data received from the interview process. Jetzek (2016) revealed that researchers could use the information provided on a company's website as a data collection technique to support the primary research question. Ang, Embi, and Md Yunus (2016) contended the use of multiple data sources in a qualitative case study enhances the research reliability and validity of a study. I relied on the semistructured interview technique and the use of research documentation as a means to satisfy the answer to the research question.

For documentation, I collected data for this study using electronic recordings, transcribed notes, a reflection journal, notecards, and charts. Upon obtaining verbal permission from the participant to digitally record face-to-face interviews, I used a Samsung Galaxy tablet for audio recording and a Samsung Galaxy Note 8 cellular phone as a backup in case of device failure. In recording face-to-face, each participant could

review my interpretations and note changes from the interview to ensure reliability and validity. I listened to the interview recordings and transcribed the recordings verbatim. Tran, Porcher, Tran, and Ravaud (2017) claimed researchers with participants who are comfortable in a recording session are able to make clarifications during the interview. A researcher is responsible for storing confidential data about participants for their protection (Yin, 2018). I stored the consent forms and written data in my locked office safe and stored the electronic data on my password-protected computer and password-protected external hard drive.

Pocock (2015) suggested researchers could alleviate bias by using a reflective journal. After completing the interviews and starting the data analysis for this study, I created a reflective journal. I wrote the detailed records of initial patterns, themes, and concepts that emerged from the interview transcriptions. Yin (2018) recommended using a reflective journal to record observations and notes while conducting interviews. I transcribed the handwritten reflective journal notes and stored them in the participant's electronic folder on my personal computer. I secured my research data such as recordings, transcribed notes, and the personal information about each participant using an electronic format and a combination safe.

MacQueen and Milstein (1999) suggested implementing computer technology when storing, retrieving, sorting, and analyzing data. Neale (2016) advised using a Microsoft Word document or Microsoft Excel spreadsheet to export the findings of themes and new information at the end of my qualitative analysis. I used a Microsoft Excel spreadsheet to export the findings of themes and new information for my

qualitative analysis. I created a participant spreadsheet using Microsoft Excel containing the identification codes, dates, and other important information related to the interviewees. For example, I labeled my research materials with identification numbers and codes to protect participant identity. By assigning identification codes, I could identify between participants and organization to label the data accurately. I transferred the information from the Excel spreadsheet into the NVivo software for coding. I plan to store the research data securely for 5 years using the electronic format and a combination safe. After the 5-year timeframe, I plan to destroy the research documentation and raw data collected by erasing the computer data using the KillDisk software.

Palinkas et al. (2015) suggested semistructured interviews as a source to collect case study data. Semistructured interviews have advantages and disadvantages. One advantage of semistructured interviews is the flexibility and ability of the researcher to ask questions to clarify participant responses (Hofisi, Hofisi, & Mago, 2014). Another advantage of semistructured interviews is the use of open-ended questions that could provide the researchers with the opportunity to share their views and participant data collection (Blandisi, Clow, & Ricciardelli, 2015). The third advantage of semistructured interviews is the informal atmosphere that could encourage the participant to be open and honest (Jong & Jung, 2015).

Pandey and Chawla (2016) implied one disadvantage of semistructured interviews is that interviews could be expensive and time-consuming. Another disadvantage is the prejudices, stereotypes, and assumptions of the interviewer, which might affect the interview outcomes (Hofisi et al., 2014). I conducted semistructured interviews

consisting of open-ended questions to encourage participants to share their experiences. The option to conduct a face-to-face or telephonic interview was not the only concern. Another concern was managing the sound quality and acoustics for privacy. The sound quality and acoustics could be an issue as conducting interviews outside of a participant's work area could cause the participant to become uncomfortable, which could distract the participant's way of thinking (Jacob & Furgerson, 2012; Radcliffe, 2013; Yin, 2018). Another concern in managing sound quality and acoustics was that nonparticipants could disrupt the interviews or could hear the interview through the walls (Beach et al., 2013). I mitigated privacy concerns by selecting a conference room, which was free of distractions and away from other nonparticipants.

To enhance the reliability and validity of the semistructured interviews, Yin (2018) stated using member checking as part of the follow-up during the study to confirm data captured by the researcher. I provided each participant with a summary and my interpretation of the interview and offered the opportunity for each participant to validate the accuracy and completeness of my interpretation of their responses. Birt et al. (2016) and Connelly (2016) mentioned using member checking to improve study participant credibility of results and review of the researcher’s interpretation of data. In the discovery of inaccuracies, the participant could correct, present, or explain new points to ensure the accuracy of my account of the interview. During member checking, I did not need to correct the interpretation errors for the participants. After conducting the interviews, I interpreted what the participant shared in each session and shared the interpretation with the participant for validation. The summary was a process for the participant to evaluate

interpretations and provide corrections before beginning the coding process. After coding, I interpreted what the participant shared and then shared the interpretation with the participant for validation.

## Data Organization Techniques

Noble and Smith (2015) and Majid (2016) suggested researchers use a reflective journal to minimize bias. Katz (2015) and Yin (2018) proposed the use of a reflective journal to record observations and notes while conducting interviews. Upon completion of the interview sessions, I transcribed the handwritten reflective journal notes and transferred the electronic data to a password-protected external thumb drive. I stored the handwritten reflective journal notes and electronic data in the participant's electronic folder on my personal computer. I stored the research data securely to protect the confidentiality of participants using the electronic format and a combination safe. After the 5-year timeframe, I plan to destroy the research documentation and raw data collected by erasing the computer data using the KillDisk software.

## Data Analysis

Lewis (2015) designated data analysis as a process of preparing and organizing data, categorizing them into themes or subthemes, and interpreting the results. I used methodological triangulation in my study. Methodological triangulation is the process of collecting data using more than one data collection technique (Makrakis & Kostoulas-Makrakis, 2016). Some researchers used methodological triangulation to limit bias by collecting data from multiple data sources (Overgaard, 2015; Yin, 2018). Researchers use methodological triangulation to study the same phenomenon for increasing study

credibility by collecting data from multiple methods (Hussein, 2015). Qualitative researchers used a methodological triangulation to allow the collection of different types of data related to the research topic and compiling for analysis and interpretation (Almalki, 2016). To mitigate bias and enhance study validity, I conducted semistructured interviews and reviewed company documents as my data collection instruments. I used the interview protocol as my guide for the interview process.

**Five-Phase Cycle**

Yin (2018) discussed a five-phase cycle as a specialized method to analyze qualitative data. The steps of the five-phase cycle are (a) compiling, (b) disassembling, (c) reassembling, (d) interpreting, and (e) concluding. Castillo-Montoya (2016) and Yazan (2015) suggested triangulating across data sources and analyzing the categories received through the coding process. I used the five steps to analyze the categories received from the coding process enabling the exploration of new information to answer my research question.

**Compiling.** Tuapawa (2017) noted the first phase in structuring data analysis is compiling data. Haines, Summers, Turnbull, Turnbull, and Palmer (2015) defined compiling as the process of organizing raw data for analysis. Organizing raw data begins with the creation of digital databases for interview notes, reflective journal entries, and transcriptions from the sessions (Cox & McLeod, 2014; Yin, 2018). To ensure the transcription of sessions and the prevention of lost information, I entered each participant's interview into a reflective journal and digital database on the same day. The

process of compiling raw data included the integrity of data analysis and the confidentiality of the participants.

**Disassembling.** The second phase in structuring data analysis is disassembling data (Tuapawa, 2017). I used disassembling as a traditional approach to encode data. To compile, import, and organize my data, I used the NVivo software. Tuapawa (2017) insisted researchers disassembled data into smaller categories for individual focus one category at a time. I identified themes and patterns by assigning individual groups or smaller category names.

**Reassembling.** The third phase in structuring data analysis is reassembling data (Tuapawa, 2017). Reassembling is the process of rearranging data (Cox & McLeod, 2014). Researchers have the option to rearrange data by similar coding into vertical columns and horizontal rows (Haines et al., 2015). I observed ideas and themes to prioritize each category by order of significance and developed understandings on the phenomenon to respond to my research question.

**Interpreting.** The fourth phase in structuring data analysis is interpreting data (Tuapawa, 2017). The goal of the interpreting phase is to become familiar with the meaning of the data (Castleberry, 2014; Cox & McLeod, 2014; Tuapawa, 2017). Interpretation is the extraction of meaning from and describing the implications of data (Haines et al., 2015). Researcher ability to extract meaning from data is an anticipated element of the 5-phase cycle (Yin, 2018). Upon completion of reviewing and summarizing the interpretations, each participant had the opportunity to review my

interpretations for accuracy. I used member checking to review for accuracy and editing of interpretations with the participants.

**Concluding.** Tuapawa (2017) noted the last phase in structuring data analysis is concluding data. Cox and McLeod (2014) explained researchers represented their findings and conclusions using the concluding step. Yin (2018) stated the use of the 5-phase helps impact the conclusion of the research. To draw conclusions, I provided readers with text and tables from my interpretations and examples from the data supporting my findings.

## Coding of Qualitative Software

Stuckey (2015) discussed coding as the process of organizing and sorting qualitative data into segments to manage data. Bernauer (2015) and Nelson and Cohn (2015) mentioned that qualitative researchers have the option of transforming interview data to promote authenticity and trustworthiness and to understand the meaning. Storer, Casey, and Herrenkohl (2017) advised transcribing and verifying interview recordings before organizing them. I used color coding to classify recurring themes and modified the transcript themes from the audio-recorded material. For example, I used the Microsoft Excel spreadsheet to code and identify the themes before transferring the information to a thumb drive. Ose (2016) explained a spreadsheet is a type of software that allows the modeling of many different processes. I transcribed the audio recordings and entered the transcriptions on a Microsoft Word document. I removed the pertinent information of the participants such as names, dates, consent form receipts, and completion of the interview process from the computer and transferred the information onto a thumb drive. I analyzed

the interview transcriptions until I discovered repeated themes. I highlighted words similar in meaning and documented the words onto a notecard and attached them to a chart to compare the findings. Researchers synthesize data and findings to add reliability regarding the research question (Percy et al., 2015). I labeled each code and used the theme of the code as a naming convention. The identification codes I used were P1, P2, P3, P4, P5, P6, and O1. To ensure the confidentiality of the participants, I protected the study participant identities, the organization, and all data collected.

I asked open-ended questions when collecting data. A primary method for analyzing data is NVivo to identify patterns and themes of unstructured data (Thistoll, Hooper, & Pauleen, 2016; Woods, Paulus, Atkins, & Macklin, 2016). Researchers use inductive analysis to focus on existing categories from patterns and themes related to the research topic (Percy et al., 2015). I used NVivo as the recommended software program. A researcher using NVivo could store, organize, and delete data, which saves time and expedites the analysis process. Boyd (2017) said one advantage of NVivo is the capability of the coding program to analyze, organize, and delete unstructured texts. I used seven steps of NVivo: classifications, clusters, consultations, models, nodes, reports, and sources (Aparicio, Bacao, & Oliveira, 2016). NVivo is beneficial in the understanding of an in-depth analysis by displaying the number of times a code appears throughout raw data (Thistoll et al., 2016). I used NVivo for the overview of each item by structuring the sources and categories. I compared coding to enable the arrival of new data using NVivo after classification. Aparicio et al. (2016) recommended the use of models, charts, and graphs to display relations between raw and analyzed data. In the

nodes phase, I created corresponding categories, which aligned with my research question. In the sources phase, I imported raw data into NVivo to assist in assigning category names or words to the segmented data.

## Reliability and Validity

McIntosh and Morse (2015) explained that qualitative reliability and validity could assist researchers to incorporate strategies for examining and establishing the discovery of similar results using a similar process. Noble and Smith (2015) stated that researchers focus on trustworthiness in their study to ensure integrity from their conclusions. Zhang and Wildemuth (2016) listed dependability, credibility, transferability, and confirmability as criteria to assess reliability, validity, soundness, and trustworthiness in research.

### Reliability

Noble and Smith (2015) defined reliability as the ability to obtain similar or comparable findings using methods dependent on an independent researcher's methods or procedures. Researchers seek reliability to help ensure the accuracy and consistency of their data (Sarma, 2015). I ensured reliability and trustworthiness by employing member checking and offering a one–or two–page summary of my interpretations for confirmation or revisions to the participants. Joslin and Müller (2016) identified methodological triangulation as the most commonly used multitriangulation, which could confirm the reliability of the data by comparing the data retrieved from participants. I used the methodological triangulation method. I used triangulation to obtain data from multiple sources of evidence. I followed the interview protocol to enhance the reliability

and dependability of this study. Dikko (2016) and Yin (2018) noted that researchers use an interview protocol as a guide to ensure adherence to the procedures and rules to conduct research.

**Dependability.** Dependability occurs when the findings of the research are consistent and repeatable (Matamonasa-Bennett, 2015). Researchers ensure dependability by providing research findings with stable results, consistent findings, and allow future researchers to follow a similar framework (Yin, 2018). To confirm dependability, I used member checking before coding. Member checking is the process, which involves the researcher giving the researcher's interpretation of participant responses to the interview questions back to the participant for confirmation and validation (Birt et al., 2016). The member checking follow-up interview could help the researcher reach data saturation by obtaining in-depth information and enhancing academic rigor (Carr & Worth, 2001; Hibbler & Shinew, 2002). Participants might clarify, confirm, and or correct their responses before a researcher proceeds with data analysis, which helps with trustworthiness with the participant and effectiveness of the research process (Simpson & Quigley, 2016; Thomas, 2017). I provided each participant with an interpretation of the interview and offered the opportunity for each participant to validate the accuracy and completeness of my interpretation of their responses. Based on participant feedback, I corrected the interpretation errors and reengaged in member checking with the affected participants.

## Validity

Qualitative validity is the determination of whether the findings in a study are accurate from the viewpoint of the researcher, the participant, or the reader (Mariotto, Zanni, & Moraes, 2014). I used triangulation to prevent potential threats to my findings. Leung (2015) argued researchers sought validity in qualitative research to identify associations between the suggested use of data collection tools and the ability to use results to make decisions. Kornbluh (2015) proclaimed researchers increase trustworthiness by employing effective methods and strategies for qualitative case studies worthy of consideration by readers. Lub (2015) suggested qualitative researchers use validity procedures aimed at promoting the accuracy of their research, which researchers use to unite different worldviews explaining the phenomenon. Rajendran, Hodgkinson, and Rayman (2015) determined using triangulation when obtaining data from multiple sources helps to ensure validity. Hammarberg et al. (2016) explained researchers who sought validity in qualitative research centered on the credibility and transferability of the research findings.

**Credibility.** Credibility is how confident the qualitative researcher is in the truth of the research study findings (Anney, 2014). Credibility criteria involves establishing that the results of qualitative research are credible or believable from the viewpoint of the study participants in the research (Driessen, Van Der Vleuten, Schuwirth, Van Tartwijk, & Vermunt, 2005). Researchers use credibility following data collection practices, which are of value and acceptance across the academic and practitioner community (Sarma, 2015). To ensure credibility and the completeness and conciseness of my research

member checking, I provided a copy of my interpretation of the study participant responses to the interview questions to each participant for validation. Upon the participant validation, I used the participant validation to check my transcription credibility.

**Transferability.** Transferability is how the qualitative researcher demonstrates that the research study findings are applicable to a similar situation, similar population, or similar phenomenon (Sarma, 2015). For example, a qualitative researcher could decide whether the findings of one study are applicable to another similar situation. Transferability is the responsibility of the researcher (Sarma, 2015). To address transferability, I provided rich descriptions of the research procedure used under the discussed phenomenon. Gelling (2016) contended a reader should be able to take the research and its collection method and compare it to a similar situation obtaining similar results in another setting. The person transferring the results to a different context decided how sensible the transfer was. Qualitative researchers could use a thick description to show that the research study findings could be applied to other contexts, circumstances, and situations (Jouhari, Haghani, & Changiz, 2015). To enhance transferability, I provided detailed descriptions of the findings from the study as readers and researchers could see opportunities for transferability of the findings for future research.

**Confirmability.** Confirmability refers to the degree findings could be confirmed or corroborated by others based on participant responses and not on the bias or personal motivations of the researcher (Anney, 2014). One strategy to enhance confirmability was to ensure that researcher bias did not alter the interpretation of the research participant

responses to fit a certain narrative. Kallio et al. (2016) suggested the use of semistructured interviews to avoid potential bias, resulting in expanded research confirmability. Another strategy to establish confirmability is using a reflective journal, which could highlight every step of data analysis made to provide a rationale for the decisions made (Van Rensburg & Ukpere, 2014). The reflective journal established my research study findings accurately portrayed participant responses. I used the reflective journal to document the procedures for checking and rechecking the data throughout the study. A researcher could actively search for and describe any negative instances that disagree with prior observations.

**Data Saturation.** Kallio et al. (2016) defined data saturation as the flexibility and versatility to provide researchers with sufficient data necessary for responding to the research question. Fusch and Ness (2015) professed that achieving data saturation occurred when no new evidence or no new themes emerge. Achieving data saturation in a single case study is present when there is no discovery of new evidence or information related to the research question (Boddy, 2016). I asked each participant five questions and compared their responses along with documentation until no new information was present. If I did not reach data saturation within my current sample size, I referred back to my population to select more participants.

## Transition and Summary

In Section 2, I reviewed the purpose statement, the role of the researcher, study participants, research method and design, population and sampling, ethical research, data collection, data analysis, data organization techniques, reliability, and validity. In Section

3, I provided (a) presentation of my findings, (b) discussion of my findings application to professional practice, (c) implications for social change, (d) recommendations for action, and (e) recommendations for further research. I discussed the implications of social change, provided suggestions for future research addressing a deficit in business practice, and offered strategies relevant to manager practices used for improving workplace safety within an organization. I concluded Section 3 with reflections of my experiences as a DBA doctoral student.

Section 3: Application to Professional Practice and Implications for Change

## Introduction

The purpose of this qualitative single case study was to explore strategies some organizational managers used to reduce workplace accidents. The research findings revealed that safety management system practices could create a safer and more productive workplace starting at the strategic level. The selected participants confirmed that an organizational manager could positively influence employees and impact the organization, which was consistent with the research findings from my review of the extant literature. From the results of the study on creating a safer workplace, organizational managers could implement effective safety programs enforcing the organization's safety standards; develop attainable organizational safety goals; create a formal system of risk identification, mitigation, and reduction before each specified task; and conduct a risk assessment on the probability of each potential risk or hazard. In addition, the findings revealed that risk identification and mitigation are key steps in a workplace safety improvement program.

## Presentation of the Findings

The overarching research question for this study was: What workplace safety strategies do managers use to reduce workplace accidents? From the research question, I presented five predetermined open-ended interview questions to participants on workplace accidents. Participants consisted of six managers from one organization who have overseen safety issues at one organization and developed strategies to reduce workplace accidents. Each participant was identified with a code such as Participant 1

(P1), Participant 2 (P2), Participant 3 (P3), etc. to protect each participant's identity and for presenting evidence from participants' responses in support of the themes. Based on the data analysis, participant responses to open-ended interview questions formed the basis of the research findings and revealed the emergence of four major themes: (a) the need for safety training, (b) a culture for safety awareness, (c) the implementation of company-wide safety policies, and (d) the creation of safety teams.

**Theme 1: Enforcing the Need for Safety Training**

The first theme to emerge from data analysis and coded data was enforcing the need for safety training. All participants identified the need for safety training to reduce accidents in the workplace. P4 emphasized the importance of mandatory safety training and the importance of managerial involvement in the process. P4's strategy was supported by Menger et al. (2016) who posited that increased rates of work-related injuries and illnesses indicated an urgent need for safety training that will promote safe practices among workers. P4 provided one strategy aligned with Jitwasinkul et al.'s (2016) assertion that improving safety in the workplace helps ensure worker confidence regarding safety and safety training. The company documents, which included annual reports, policy documents, and occupational safety and health (OSH) procedure manuals, indicated that mandated safety training could ensure workers feel confident regarding safety practices within the workplace. The strategic policy documents available through the company website included building a safe work environment through employee engagement and targeted safety training.

Although videos have been a popular method of safety training, participants communicated that videos do not sufficiently meet safety training needs. When discussing methods for training employees, P3 and P5 indicated the use of video and training modules are tools each one uses to train employees on safety procedures. P3 asserted, “We utilize a lot of our resources from the safety learning modules by videos showing them the correct safety preventative measures on what’s right and what’s wrong.” While P5 indicated the use of video and training modules, P5 added, “So we have a video that we give, a computer-generated media test that they have to do but you know, a lot of people are like me I learned this in the process.” P5's assertion that learning the process through action is beneficial and supported by the results of Feng et al.’s (2016) study that employee safety knowledge might increase but knowledge of safety behavior might not. Liu et al. (2015) indicated that safety knowledge is associated with a safety climate and safety behavior, while Toppazzini and Wiener (2017) noted that employees lacking in safety knowledge pose a greater risk to workplace accidents and injuries.

Study participants communicated that safety training should address the specific habits and practices of workers and therefore needs to be more extensive than introductory videos and trainings. According to P1, ensuring that all employees understand appropriate safety procedures involves formal and informal training. P1 shared the need to, “identify your outlying associates and then have one-off conversations to get them to completely understand the programs and or understand the change in the way that I want the programs ran and [touch base with them] daily.”

P1's strategy aligned with Jonathan and Mbogo's (2016) assertion that safety training is important to ensure employees are safe in the workplace. P2 used a similar strategy and admitted to examining safety issues month-to-month and explained,

> I look at the training report that we have that tells us 'How many issues we identified the cert department?' So, if I identified six issues in the lumber department and I keep identifying the same six, I have somebody that I have not reached out to and trained.

Study participants emphasized the importance of ongoing correction of worker safety practices. According to P2, it is imperative that in a building with over 150 employees that each employee knows they can count on the people behind them, which requires ensuring the "SM [store management] staff, the department supervisor staff, and the store manager on what safety is supposed to look like." The assertion aligned with Unnikrishnan et al. (2015) who identified the importance of the development and sustainment of safety training in improving workplace safety and reducing workplace accidents. P6 asserted that the correction of an associate could also serve as part of safety training. P6 explained further in the following example:

> I saw someone get up on a piece of machinery without the little belt used to tie himself as it goes up. I let him know the safety risks of not putting it on. If I go back and see that same person doing the same thing, maybe I didn't say something correctly or maybe they didn't understand what I said. So then, I let him know, [it's] the second time I'm seeing you without a belt on [and] you can fall.

P6's response highlights the importance of ongoing safety training for employees and supported Liu et al.'s (2015) assertion that safety training is crucial for managers who want to enhance safety knowledge and safety behaviors within the organization.

In the development of domino theory, Heinrich (1959) identified a lack of knowledge or skill as one of the four reasons why individuals commit dangerous acts in the workplace. HDT theory was supported by participant responses regarding the importance of ensuring each associate receives adequate safety training. Although participants conveyed different preferences regarding the best way to ensure employees have the knowledge necessary to maintain a safe work environment, they each identified a need for training beyond watching videos and taking tests, indicating the need for real-life teaching and coaching on appropriate safety procedures.

P1, P3, P4, and P6 indicated the need for and benefit of safety programs to reduce workplace accidents. For example, P1 explained, "A key component of the safety program requires every associate that works in my entire building to do a safety walk in the morning." P3 suggested a safety routine where every morning the associates conduct a safety check by walking the area and searching for safety issues. As a manager, P3 mentioned the checks had to be complete by 12 p.m. so P3 could confirm completion and document safety checks, as noted on a review of the company's strategic policy documents. P3's safety routine involved important information sharing to ensure continued safety awareness throughout the day. P1 and P3's responses aligned with BBS as an effective approach toward improving workplace safety (Choudhry, 2014). The responses of P1 and P3 aligned with the company's safety plans and goals for each

quarter, indicating a strong interest in safety, but admitting more training need to be extended.

The responses of P1 and P3 supported previous research. Campione and Famolaro (2018) determined that implementing safety initiatives and programs will improve an organization's culture of safety. Cabral et al. (2016) posited the use of a safety checklist to improve employee communication and enhance a culture of safety. A safety checklist was supported by P3 and P6. P3 explained, "We use a safety checklist through our computer system. If our computer system's down, there is a printout that you can use for each area that we give out." P6 and employees used a safety application to enhance their safety routine. "Every day we have someone walk the store identifying safety issues or violations and put them into the application. Then we have to follow up with our associates to make sure those get done." P6 continued, "I also go back through that area where they saw a safety issue to ensure that there are no other safety issues." P6, added the application has the benefit of providing the user with a plan for correcting issues they were unable to address previously. P3 and P6's safety routines included the implementation of existing safety procedures, which Cabral et al. (2016) asserted would improve the culture of safety in the workplace.

Researchers have indicated the benefits of implementing programs based on the clear indicators regarding safety performance. Yuan and Wang (2012) asserted using the BBS card-issuing system will help managers successfully evaluate the safety behavior of employees. Yuan and Wang (2012) discussed the use of green and yellow cards to indicate successes and failures. Like the program studied by Yuan and Wang (2012), P4

described a program that has worked within the organization, “The company actually rolled out another program and it's basically safety shrink knowledge for the associates. It is a little competitive. You get points, but you have to make sure that you are actually taking the courses and taking the tests.” P4 finished describing the process by saying, “that just creates more awareness.” The program aligned with Bavafa et al.’s (2018) assertion that the prevention of unacceptable behavior, detection of improper behavior, and obtaining proper documentation of accidents are important safety objectives. Bavafa et al. found SMSCM could underscore the need for safety programs for organizational managers and employees, which the participant responses supported. Although managers and workers play important roles with respect to enhancing the culture of safety in the workplace, workplace safety also depends on the policies implemented by the company.

**Theme 2: Creating a Culture for Safety Awareness**

The second theme to emerge from data analysis and coded data was creating a culture for safety awareness. All participants identified the need for safety awareness to reduce accidents in the workplace. Hughes et al. (2015) noted organizational managers have used SMSCM to promote safety awareness in the workplace. Heinrich (1959) explained managers could use SMSCM to inspire employees via expectations, perceptions, and safety awareness to work toward the safety goals of the organization. P1 supported the daily recording of missed safety issues in the workplace indicating,

> It doesn’t negatively impact us. It is about changing the mindset [of employees]. Getting them to understand that as long as you record it and fix it, then we're doing what we're supposed to be doing by keeping each other safe.

P1 indicated the change in mindset required around increasing safety awareness in the workplace, "the biggest negative stigma is the fear that if employees say something about safety issues, then that means they are calling someone else out for not doing something." P1 asserted:

> When employees say something about it, they are actually doing the right thing, because they are helping prevent accidents and injuries. So once you get that cultural shift regarding how employees think about it and look at [saying something], makes keeping a workplace safe extremely easy.

P1's responses supported the study conducted by Hofmann et al. (2017) who indicated employees need to be comfortable working with managers to increase safety awareness to ensure personal safety.

The participant responses indicated that employees should take ownership of safety awareness. P2 explained the role complacency has in safety awareness,

> Now, it's probably a complacency thing because you see it every day now. It's big and you get complacent with it. So that's why it's vital to pay attention to actually talk to the people … [and develop] if you see it correct it, behaviors.

While P3 stated that safety awareness requires

> … regularly walking the floor and constantly looking for objects that may be in the way. One of those things is where a lot of people would walk right by a safety issue versus stopping to correct it or notify the safety team.

P4 asserted that making employees aware of the safety issues is what leads to a safer environment and shared how managers might address employees:

> Hey throughout the day, let us be cognizant of the things that are around us and be aware of your surroundings. Examples include like if you see an empty pallet on the ground, go ahead and pick it up, and take it to the bullpen where it belongs. If you have a pallet jack that is not in use, make sure it is tucked under a bag or inside of a pallet so that no one way trips over it.

P4 further explained that repetition is essential, "We said it yesterday, we're going to say it today, and we're going to say it tomorrow, because we want to make sure that everybody walks out the way they walked in." Each of these responses aligned with the concept of BBS, as Jasiulewicz-Kaczmarek et al. (2015) stated hazard identification helps decrease accidents in the workplace.

To increase hazard identification, participants indicated the need of managers to actively participate in the process through paying attention to the actions of employees in relation to workplace safety. Both P5 and P6 identified the need to actively watch employees to ensure each one is using the equipment properly as a key to safety awareness. P5 shared that managerial awareness involves not only seeing hazards, but paying attention to those employees creating hazards, "I have repeat offenders. So with the repeat offenders, I'm acutely aware of and I know the issues that they're dealing with and I know why no one's doing it out of spite." P6 conveyed, "I'm always watching. I'm constantly pacing the floors." P6 continued, "I never understood safety until I got on the management team. You have to constantly have meetings. So that way, the associates can understand [safety] procedures and continue increasing our current number of days without an accident." The statements of P5 and P6 aligned with Stubbé et al. (2017) who

asserted understanding how an organization's employees acquire and disseminate new knowledge will help managers to increase safety awareness.

P1, P3, P5, and P6 indicated the necessity of increasing safety awareness among employees, which begins with management identifying unsafe acts in the workplace. The participants acknowledged that workplace managers could not overlook increasing safety awareness by addressing unsafe acts when they occur. P6 pointed out the importance of making "on the spot corrections and not ignoring a safety violation that will not be as effectively addressed three to five hours later when the associate has forgotten about it." P6's response supported the importance of safety awareness among the entire organization's employees and aligned with Heinrich's (1959) SMSCM that unsafe acts and conditions cause safety accidents in the workplace. Heinrich revealed through HDT that workplace accidents result from a chain of sequential events based on unsafe conditions or acts in the workplace. P1 asserted that it is the responsibility of managers to "look for blockages that may impede traffic, ensure ladders are chained down, and to make sure that every piece of power equipment is powered down properly." P1's assertion aligned with HDT that if all employees follow the expectations of safety behaviors then accidents might be limited.

Aligning with identification of unsafe acts is the need for continuous discussion regarding safety and unsafety in the workplace. P2 suggested one reason employees might fail to follow safety routines is that "safety takes a little bit longer to do." P5 proposed one way managers could address the issue is to acknowledge unsafe acts when

they occur and to discuss with the employee safety and the dangers of an unsafe environment,

> …when I see associates committing a safety violation, I give them the why and I explain why the associate's action was a safety violation. So, what I like to do is give someone a visual. I explain why it is important to be safe first and a lot of times my explanation is graphic. Once they understand the [potential] consequences everything they do is different. Every person that I know in this business who has been involved in an accident or has seen an accident has a completely different perspective on safety routines and protocols.

P6 shared a similar response regarding how to initially address unsafe acts in the workplace, stating that it is likely, "… the individual was probably unaware of the safety violation policy. I would tell them hey, you can't do that because this is what it can lead to … You have to really sit down with someone and get them to understand safety. I enforce learning if they understand how important it is." As a manager, P6 explained,

> … [I am] always looking up and down for safety issues. For example, are there any pallets not shrink wrapped correctly or are all pegs secured and I do this every day with my area and I walk through other areas ensuring that everything is free of safety issues and I walk through other assistance areas to just make sure that we didn't miss anything.

The responses of P5 and P6 aligned with Lay et al. (2017) who asserted that enhancing the safety climate in the workplace could eliminate unsafe conditions, thereby reducing incidents. P5 and P6 responses aligned with the company's goals outlined in the quarterly

safety plans and the goal of identifying the need to increase meetings to ensure all employees understand safety policies and procedures.

Shuen and Wahab (2016) found 88% of accidents were a direct result of unsafe human behavior and 10% were a direct result of an unsafe physical environment, leaving only 2% of accidents caused by human error. P2 shared an experience with a previous manager who used to say, "we had to slow down to go faster, because once you slow down you understand, why we're doing what we're doing, you start to get into a rhythm and you go faster at doing it," which will potentially eliminate accidents resulting from unsafe behaviors and unsafe physical environments. In contrast, P3 indicated that sometimes people do not know how to fix the issues. When employees were engaging in unsafe acts, P3 would point out the behavior and show how to adjust their actions. P3 would teach employees what to do in order to eliminate future instances of unsafe human behavior or unsafe physical environments.

The literature and the participant responses indicated the need to identify unsafe acts and to discuss safety measures for ensuring a safe working environment. The resulting information related to the theme of creating a culture for safety awareness supported the conceptual framework of this study. Heinrich (1959) developed SMSCM to focus on altering unsafe worker behaviors and acts that result in accidents in industry-based workplaces (Amorim & Pereira, 2015). The results of additional research indicated that workplace accidents occur through inadequate supervision, safety, training, or working in unsafe environments (Osibanjo et al., 2015).

**Theme 3: Implementing Company-wide Safety Policies**

The third theme to emerge from data analysis and coded data was implementing company-wide safety policies. During the semistructured interviews, P1, P2, P4, P5, and P6 identified the importance of implementing company-wide safety policies. As P1 shared, "For us it's about just a cultural change, identify it, record it, fix it," indicating that to reduce safety related accidents a cultural change must occur. To create the necessary cultural change, P1 implemented a system focused on ensuring a safe working environment and addressing employees who were failing to resolve safety risks. P1 explained the system worked as follows:

> [Each day,] I walk the store once everyone has recorded all [pertinent] safety information to see if I can find any safety issues still existing. Then, I go back to those particular areas in the report and see if they were notated. If the safety issues were not notated, I have a follow-up conversation with the associate who indicated that safety issue was addressed, ensuring that they know that it was not addressed fully and make sure that they understand that those are issues.

The system P1 developed included manager verification regarding whether safety issues were addressed and communicating with the associates who failed to eradicate the safety risks.

P2 indicated the use of a similar system and stated, "… we have a document that we use daily. It's a daily running document you can add and remove [safety issues] at any point in time." P2 shared an example of how the document is used related to top stock,

> … the document that we use regarding top stock includes what's acceptable, what's not acceptable. It explains how to deal with racking, what to do if something is damaged and how to replace it, how to address damaged racking, and instructions for reporting accidents as well.

Rebelo et al. (2016) claimed SMSCM is a method organizational managers could use to develop a plan for safety policies, processes, and procedures. The responses of P1 and P2 regarding strategies for improving safety policies and measures in the workplace aligned with Heinrich's SMSCM. P1 and P2's responses aligned with Jasiulewicz-Kaczmarek et al. (2015) who posited that SMSCM might be used to assist in the development of policies through an examination of BBS. The information from P1 and P2 were consistent with the strategic policy documents found on company websites concerning a safe work environment. The safety documents were posted on numerous company webpages along with the availability of mandated safety training.

Without the implementation of safety policies, P5 asserted, "...there will be different views regarding what safety looks like, resulting in the increased likelihood that workplace injuries will occur." P5 added,

> … everybody has a different perception of what safety looks like. For example, the manager of one particular department was standing with me as we watched an associate commit a safety violation as he was driving a forklift. The other manager's perspective was that although there was a minor safety violation it was for the good of the customer the associate was serving. Whereas my perspective

> was simply that it was a safety violation and we need to address the violation. The different perspectives result in employees getting mixed messages.

This viewpoint was reiterated by P6 who stated,

> I think safety is the responsibility [of the team] as a whole, but how are they going to understand the safety policies unless we implement completely. So, it is up to the leaders who are in this role because we are responsible for teaching them the safety policies and procedures of the company.

P6 concluded that managers need to take full responsibility for the teaching and training of employees by implementing company-wide safety policies and systems. P2 agreed with P6 and shared what occurred with a vacancy in the management position responsible for implementing safety policies,

> There wasn't anybody in my position for at least six to eight months. So that left a void and because every manager enforces certain parts of the job with no one responsible for safety, employees were just doing whatever they felt like doing.

Kim et al. (2016) indicated SMSCM could be used to ensure safety policies and procedures are in place to reduce workplace accidents. P2 and P6 emphasized the importance of establishing safety policies and procedures within the organization. P2 and P6's responses specified the importance of assigning a specific individual with the responsibility of implementing safety systems throughout an organization. The responses of P2 and P6 revealed the need for clearly designed safety systems that include company-wide safety policies and stressed the importance of revising each safety system when the systems are not working.

**Theme 4: Creating Safety Teams**

The fourth theme to emerge from data analysis and coded data was creating safety teams. The importance of creating safety teams, aligned with the creation or revision of company-wide safety policies. Safety management is key to advocating and promoting safety culture in the workplace (Berta et al., 2015). P1, P2, P4, and P6 identified the creation of safety teams as components of reducing workplace accidents and aligned with SMSCM. Workplace environments are complex and have multifaceted factors contributing to the occurrence of workplace accidents, and observation is not enough to develop a thorough understanding of the issue (Li & Yu, 2015). P2 shared the following regarding the importance of creating safety teams,

> I have a safety team that drives the adherence to safety rules and guidelines among the employees. We meet once a month to discuss what is going on in the store. [During this meeting] we cover a topic determined by corporate and discuss how this topic is occurring in our store.

P2 asserted the use of a team rather than a manager alone increases the likelihood that safety issues will be addressed. P2 shared the importance of understanding that a manager could not address the entire needs of an organization regarding safety,

> I have an overnight team; I have a receiving stocking team. As a manager there are a lot of employees I don't interact with because I'm working during the business hours. I'm not as available during off-peak hours, so I have to make sure that the person behind me is trained.

P2 continued to explain strategies for implementing a safety team, “I had to get people involved. I had to get the people that I felt would make the most impact.” The safety team P2 developed included co-captains responsible for identifying safety issues and explaining to their colleagues how to address the issue. As P2 shared,

> Developing a team and getting them out there was the first step. So, I chose [co-captains] who must have courage enough to walk over to the employee committing the safety violation and explain what was wrong and why it was not safe, as well as how to adjust it.

P2's strategy aligned with research from the Federal Aviation Administration (2019), which stated that the use of safety management systems provides a systematic approach to managing safety risks and assuring the effectiveness of safety risk controls.

Menger et al. (2016) explained that to ensure a safety-centered mindset, organizational managers must contribute to increased safety by hiring likeminded managers. P6's response regarding experiences as both an associate and a manager supported the need for safety teams within organizations,

> I've always [a proponent] of a safety team. Why? Because I did not really understand the importance of safety until I became a manager. As an associate, you think like, ‘Oh, they get hurt, the company will take care of it,’ without fully understanding the responsibilities of the manager, the impact of that incident, and how our current safety strategies failed to prevent the accident.

P4 endorsed the use of safety teams and indicated the necessity of dedicated time to address safety issues saying, “The safety team has a monthly meeting to review incidents and determine the root cause of the incident and how to prevent it in the future.”

In order to ensure all employees develop a safety mindset, P1 shared that as part of the safety team managers must “… go back in and validate that it's been done.” P1, P2, P4, and P6 shared how the use of safety teams are a strategy for reducing workplace accidents, which was verified through the company’s procedure guides. The participants indicated the importance of spreading safety information to other teams within the organization is to ensure that safety precautions are taken when senior management is away. Kaynak et al. (2016) stated that health and safety policy and procedures are a part of efficient health and safety management framework. In line with the results of this study, organizations seeking to modify safety policies and procedures using SMSCM, HDT, and BBS could apply the findings of this study as a blueprint for creating safety team policies and procedures. Based on SMSCM, new organizational strategies used to initiate safety team practices could be referred to while senior management is not present or further reinforced when senior management is present and participating in safety team procedures.

## Applications to Professional Practice

Reducing accidents in the workplace is essential to ensuring the safety and financial security of business stakeholders. In 2017, there were 2,811,500 reported and recordable cases of work-related injuries and illnesses (U.S. Bureau of Labor Statistics, 2018). All study participants indicated the necessity of putting consistent policies and

procedures in place to ensure workplace safety and reduce workplace accidents. The strategies identified in this study might provide other managers with a framework for implementing policies and procedures to decrease accidents in the workplace.

Organizations seeking to modify safety policies and procedures using SMSCM, HDT, and BBS could apply findings of this study as a blueprint for application. The specific examples of strategies used by managers to increase safety in the workplace might help other managers outline new policies and procedures for safety within an organization. To ensure that policies and procedures are effective and long-lasting, Akter et al. (2016) and Chughtai (2015) indicated that workplace safety occurs at the strategy level. Participant strategies included the use of safety teams in conjunctions with safety training and routines to help organizational managers create or revise company-wide safety policies. The revision of policies to include safety strategies might provide organizations with systems to help increase safety behavior and reduce workplace accidents. Although safety strategies are applicable to a variety of organizations, the strategies might not apply to organizations in specific fields. Using strategies from this study might help organizational managers place the safety agenda at the center of attention for employees and keep them informed about proper safety protocols within an organization. Safety in the workplace has been an increasing concern for managers and employees (Wei et al., 2015). Workplace safety is critical for increasing the efficiency and effectiveness of the organization (Jitwasinkul et al., 2016). Managers could use safety awareness to help limit revenue losses (Mansour, 2016) and reduce work-related accidents (Rathi & Lee, 2015).

## Implications for Social Change

The results of this study might contribute to positive social change by encouraging employees to improve safety practices and encourage managers to address policies and procedures concerning workplace accidents for the health and safety of the community. Employees could also use learned skills for increasing safety in the workplace and to assist community organizations in developing policies for eliminating workplace accidents. Improving workplace safety and reducing workplace accidents could increase organizational sustainment, create job opportunities in the local community, and strengthen the economy. The findings and recommendations of this study could assist managers in implementing safety in the workplace environment, which benefits the health of local communities by keeping members safe, healthy, and able to participate in community level activities and could sustain employment for the benefit of the local economy.

## Recommendations for Action

The results presented in this study could assist organizational managers in reducing accidents in the workplace. Managers could reduce workplace accidents by incorporating SMSCM, HDT, and BBS into the blueprints for safety policies and procedures, providing safety training, increasing safety awareness, and creating or revising company-wide safety policies. Organizational managers should consider the following recommendations:

- Adopt the SMSCM framework, HDT, and BBS into the development of organization safety policies and procedures;

- Ensure organizational safety training includes discussion regarding unsafe acts and the use of proper protective equipment and equipment care;
- Make certain, through the creation of safety teams and safety programs, that the organization's employees have an awareness of safety policies and procedures;
- Include repercussions for unsafe behavior and safety violations and incentives for appropriate adherence to organizational safety policies and procedures.

To encourage the use of the strategies indicated above, I will provide each participant with a summary of the findings after my study has been published in ProQuest. I will also share a summary of the findings with the senior managers at safety management meetings, conferences, workshops, and or safety training seminars. After printing the safety information, I will distribute the materials to organizational managers when visiting these locations and strive to make presentations in work environments where job-related accidents are more common.

## Recommendations for Further Research

Organizational manager perspectives and practices are important to study (Bavafa et al., 2018). The knowledge regarding the strategies some organizational managers used to reduce workplace accidents that arose from this study contributed to addressing a gap in the understanding of effective business practices related to the risk of employee injuries, fatalities, business downtime, absenteeism, and financial loss. The findings of this study confirmed previous research regarding accidents in the workplace. Based on the limitations of this qualitative single case study, I have identified areas for further research. One limitation was the participants' lack of consistent work schedules. This

study included six organizational managers from one organization. Conducting further research using quantitative method to include more than one organization and a larger sample size of participants working the same schedules within different organizations could reveal further strategies applicable to workplace safety. A second limitation is the workplace culture and the need for a broader survey of management strategies for reducing workplace accidents. I recommend further research on multiple organizations or workplace cultures, which could alleviate the concern that workplace specificity influenced participant responses. A geographical area outside the central region of North Carolina with a larger population could help to address the third limitation regarding the lack of transferability to other businesses.

Data regarding safety teams and the lack of scholarly research on safety teams indicated the need for research regarding the use of safety teams. Information is lacking regarding the importance of proper protective equipment and equipment care in previous research studies, but participant responses indicated equipment care and safety is an essential component of reducing accidents in the workplace. Future researchers could address potential drawbacks of competitive safety programs as participants mentioned programs in their responses, yet researchers have not examined or gleaned information from participant responses regarding how these programs fail. Finally, based on limited information for the literature review and participant responses, researchers might benefit from studying the use of incentives for adhering to safety policies. Researchers could use the quantitative method or mixed methods approach to examine the relationship between employee accidents, productivity, absenteeism, and financial loss. Generating a larger

data set in a greater variety of businesses could reveal even more effective strategies for reducing workplace accidents and injuries and contribute to increasing generalizability. Researchers could use the quantitative method or mixed methods to gain new insights, which could help reduce workplace accidents.

## Reflections

I began the journey of pursuing a Doctor of Business Administration (DBA) and have gained a profound sense of accomplishment. In this pursuit, I set high personal and professional goals for myself and felt challenged in prioritizing and balancing my time and responsibilities among family, school, and work. Patience and time management was key throughout the entire process. The DBA learning process provided me with available resources enabling me to improve my writing skills. One challenge for the study was preventing my personal biases from affecting the results of the research. I set aside my initial thoughts and beliefs that could limit alternative perspectives about the exploration of safety management system strategies for increasing workplace safety and reducing workplace accidents. Before I started research on workplace safety accidents, I believed that senior organizational managers were solely responsible for actions in the workplace. Yet, after reading and analyzing over 300 articles on workplace safety, I learned that organizational managers and employees are held responsible and key components of reducing workplace accidents begin with the safety training with knowledge of new employees for that organization. Organizational managers and employees need to realize that safety is a collective task within an organization. I learned incorporating safety management practices could affect social change throughout the workplace where each

individual is responsible for completing safety training and practicing safety awareness each time. In conducting this doctoral research study, I realized developing safety applications specifically for an organization increased organization safety management practices and decreased workplace accidents.

On collecting data to support this research, I initially underestimated time consumption and the challenge of recruiting participants who met criteria eligibility. Despite the sample size, participants shared sufficient information on the topic leading to achieving data saturation and completing the data collection process. My goal from the start of my academic journey was to never quit and to continue to the very end. Along my doctoral journey, I have encountered changes in leadership, upgrades to tools and equipment from technological advances, and experienced horrific life-changing natural disasters. As I reflected on the work I have done, I realized my enthusiasm to finish was centered around the three D's for success that I have been blessed to display throughout this academic journey as determination, dedication, and discipline.

## Conclusion

Accidents in the workplace resulting from employee oversight have caused injury to employees and customers (Krishnan et al., 2017). Organizational managers face the challenge of ensuring each employee adheres to safety policies and procedures to reduce accidents in the workplace (Menger et al., 2016). The purpose of this qualitative single case study was to explore strategies used by managers to increase safety and reduce accidents in the workplace. The targeted population included six managers who noted safety issues at one organization in the central region of North Carolina who have

developed strategies to reduce workplace accidents. During data analysis, I focused on themes pertinent to the central research question and the conceptual framework. The data analysis revealed the four major themes. The study findings confirmed with existing literature and knowledge regarding strategies to reduce workplace accidents. Increasing knowledge regarding successful strategies for reducing accidents in the workplace might provide managers with methods each one could use in an organization. The workplace strategies considered in this study might also provide managers within other organizations with tools for creating effective policies and procedures to reduce accidents in the workplace.

# References

Aarseth, W., Ahola, T., Aaltonen, K., Økland, A., & Andersen, B. (2017). Project sustainability strategies: A systematic literature review. *International Journal of Project Management, 35,* 1071-1083. doi:10.1016/j.ijproman.2016.11.006

Ahn, J. J., Kim, Y., Corley, E. A., & Scheufele, D. A. (2016). Laboratory safety and nanotechnology workers: An analysis of current guidelines in the USA. *NanoEthics, 10*(1)*,* 5-23. doi:10.1007/s11569-016-0250-9

Aitsi-Selmi, A., & Murray, V. (2016). The Chernobyl disaster and beyond: Implications of the Sendai framework for disaster risk reduction 2015–2030. *PLoS Medicine, 13,* 1-4. doi:10.1371/journal.pmed.1002017

Ajagbe, A. M., Sholanke, A. B., Isiavwe, D. T., & Oke, A. O. (2015). Qualitative inquiry for social sciences. *Proceeding of Covenant University International Conference of African Development Issues, CU-ICADI-2015*. Retrieved from http://www.eprints.covenantuniversity.edu.ng/id/eprint/5293

Akter, S., Wamba, S. F., Gunasekaran, A., Dubey, R., & Childe, S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics, 182,* 113-131. doi:10.1016/j.ijpe.2016.08.018

Alarcón, L. F., Acuña, D., Diethelm, S., & Pellicer, E. (2016). Strategies for improving safety performance in construction firms. *Accident Analysis & Prevention, 94,* 107-118. doi:10.1016/j.aap.2016.05.021

Alase, A. (2017). The interpretative phenomenological analysis (IPA): A guide to a good

qualitative research approach. *International Journal of Education & Literacy Studies, 5,* 9-19. doi:10.7575/aiac.ijels.v.5n.2p.9

Alaswad, S., & Xiang, Y. (2017). A review on condition-based maintenance optimization models for stochastically deteriorating system. *Reliability Engineering & System Safety, 157,* 54-63. doi:10.1016/j.ress.2016.08.009

Albliwi, S. A., Antony, J., & Lim, S. A. H. (2015). A systematic review of Lean Six Sigma for the manufacturing industry. *Business Process Management Journal, 21,* 665-691. doi:10.1108/BPMJ-03-2014-0019

Al-Dhaafri, H. S., Al-Swidi, A. K., & Yusoff, R. Z. B. (2016). The mediating role of Total Quality Management between the entrepreneurial orientation and the organizational performance. *The TQM Journal, 28*(1)*,* 89-111. doi:10.1108/TQM-03-2014-0033

Alegre, I., Mas-Machuca, M., & Berbegal-Mirabent, J. (2016). Antecedents of employee job satisfaction: Do they matter? *Journal of Business Research, 69,* 1390-1395. doi:10.1016/j.jbusres.2015.10.113

Allred, B. B., Findley, M. G., Nielson, D., & Sharman, J. C. (2017). Anonymous shell companies: A global audit study and field experiment in 176 countries. *Journal of International Business Studies, 48,* 596-619. doi:10.1057/s41267-017-0135-3

Almalki, S. (2016). Integrating quantitative and qualitative data in mixed methods research – Challenges and benefits. *Journal of Education and Learning, 5,* 288-296. doi:10.5539/jel.v5n3p288

Almurshidi, S. H., & Naser, S. S. A. (2017). Design and development of diabetes

intelligent tutoring system. *European Academic Research, 4,* 8117-8128. Retrieved from http://www.euacedmic.org

Álvarez-Santos, J., Miguel-Dávila, J. Á., Herrera, L., & Nieto, M. (2018). Safety management system in TQM environments. *Safety Science, 101,* 135-143. doi:10.1016/j.ssci.2017.08.019

American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) (2015). *Death on the job: The toll of neglect*. Retrieved from http://www.aflcio.org

Amorim, A. G., & Pereira, C. M. (2015). Improvisation at workplace and accident causation-an exploratory study. *Procedia Manufacturing, 3,* 1804-1811. doi:10.1016/j.promfg.2015.07.219

Ang, C. K., Embi, M. A., & Md Yunus, M. (2016). Enhancing the quality of the findings of a longitudinal case study: Reviewing trustworthiness via ATLAS.ti. *The Qualitative Report, 21*(10)*,* 1855-1867. Retrieved from http://www.nsuworks.nova.edu

Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies, 5,* 272-281. Retrieved from http://www. jeteraps.scholarlinkresearch.com

Aparicio, M., Bacao, F., & Oliveira, T. (2016). An e-learning theoretical framework. *Educational Technology and Society, 19*(1)*,* 292-307. Retrieved from http://www.run.unl.pt

Asanka, W. A., & Ranasinghe, M. (2015, December). Study on the impact of accidents on construction projects. In *6th International Conference on Structural Engineering and Construction Management, 58-67*. Retrieved from http://www.pdfs.semanticscholar.org

Awal, Z. I., & Hasegawa, K. (2017). A study on accident theories and application to maritime accidents. *Procedia Engineering, 194,* 298-306. doi:10.1016/j.proeng.2017.08.149

Babiceanu, R. F., & Seker, R. (2016). Big data and virtualization for manufacturing cyber-physical systems: A survey of the current status and future outlook. *Computers in Industry, 81,* 128-137. doi:10.1016/j.compind.2016.02.004

Babones, S. (2015). Interpretive quantitative methods for the social sciences. *Sociology, 50,* 453-469. doi:10.1177/0038038515583637

Bahrami, N., Soleimani, M., Yaghoabzodeh, A., & Ranjbar, H. (2016). Researcher as an instrument in qualitative research: Challenges and opportunities. *Advances in Nursing & Midwifery, 25,* 27-37. doi:10.22037/sbmunm.v25i90.11584

Bailey, C., Madden, A., Alfes, K., & Fletcher, L. (2017). The meaning, antecedents and outcomes of employee engagement: A narrative synthesis. *International Journal of Management Reviews, 19*(1)*,* 31-53. doi:10.1111/ijmr.12077

Bajaj, S., Garg, R., & Sethi, M. (2018). Total Quality Management: A critical literature review using Pareto analysis. *International Journal of Productivity and Performance Management, 67*(1)*,* 128-154. doi:10.1108/IJPPM-07-2016-0146

Baker, C., Loade, C. L., & Crone, D. (2015). Awareness of automated external

defibrillators in the community: A local study. *British Journal of Cardiac Nursing, 10,* 444-451. doi:10.12968/bjca.2015.10.9.444

Bavafa, A., Mahdiyar, A., & Marsono, A. K. (2018). Identifying and assessing the critical factors for effective implementation of safety programs in construction projects. *Safety Science, 106,* 47-56. doi:10.1016/j.ssci.2018.02.025

Beach, M. C., Roter, D., Korthuis, P. T., Epstein, R. M., Sharp, V., Ratanawongsa, N., & Saha, S. (2013). A multicenter study of physician mindfulness and health care quality. *Annals of Family Medicine, 11,* 421-428. doi:10.1370/afm.1507

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open, 2,* 8-14. doi:10.1016/j.npls.2016.01.001

Berkowitz, D., & Hedayati, H. (2017). OSHA severe injury data from 29 states: 27 workers a day suffer amputation or hospitalization. *National Employment Law Project,*1-7. Retrieved from http://www.nelp.org

Bernauer, J. A. (2015). Opening the ears that science closed: Transforming qualitative data using oral coding. *The Qualitative Report, 20,* 406-415. Retrieved from http://www.nova.edu

Berta, W., Cranley, L., Dearing, J. W., Dogherty, E. J., Squires, J. E., & Estabrooks, C. A. (2015). Why (we think) facilitation works: Insights from organizational learning theory. *Implementation Science, 10*(1)*,* 141-154. doi:10.1186/s13012-015-0323-0

Beus, J. M., McCord, M. A., & Zohar, D. (2016). Workplace safety: A review and research synthesis. *Organizational Psychology Review, 6,* 352–381.

doi:10.1177/2041386615626243

Birchall, J. (2014). Qualitative inquiry as a method to extract personal narratives: Approach to research into organizational climate change mitigation. *Qualitative Report, 19*(38)*,* 1-18. Retrieved from http://www.nsuworks.nova.edu

Bird, F. E. (1974). *Management guide to loss control management*. Atlanta, Georgia: Division of International Loss Control Institute.

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research, 26,* 1802-1811. doi:10.1177/1049732316654870

Blakey, S. M., & Abramowitz, J. S. (2016). The effects of safety behaviors during exposure therapy for anxiety: Critical analysis from an inhibitory learning perspective. *Clinical Psychology Review, 49,* 1-15. doi:10.1016/j.cpr.2016.07.002

Blandisi, I. M., Clow, K. A., & Ricciardelli, R. (2015). Public perceptions of the stigmatization of wrongly convicted individuals: Findings from semi-structured interviews. *The Qualitative Report, 20*, 1881-1904. Retrieved from http://www.nsuworks.nova.edu

Blatter, M., Muehlemann, S., Schenker, S., & Wolter, S. C. (2015). Hiring costs for skilled workers and the supply of firm-provided training. *Oxford Economic Papers, 68*(1)*,* 238-257. doi:10.1093/oep/gpv050

doi:10.1177 /1049732313502128

Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research*: *An International Journal, 19,* 426-432. doi:10.1108/QMR-06-2016-0053

Bohme, S. R. (2015). EPA's proposed worker protection standard and the burdens of the past. *International Journal of Occupational and Environmental Health, 21,* 161-165. doi:10.1179/2049396714Y.0000000099

Boyd, J. J. (2017). *Voluntary employee turnover: Retaining high-performing healthcare employees*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 10606525)

Brown, N. M., Lui, C. W., Robinson, P. C., & Boyle, F. M. (2015). Supportive care needs and preferences of lung cancer patients: A semistructured qualitative interview study. *Supportive Care in Cancer, 23,* 1533-1539. doi:10.1007/s00520-014-2508-5

Burk, J., & Hendry, J. (2014, September 9). Shop floor safety effectiveness. *American Society of Safety Engineers, 60,* 75-82. Retrieved from http://www.onepetro.org

Cabral, R. A., Eggenberger, T., Keller, K., Gallison, B. S., & Newman, D. (2016). Use of a surgical safety checklist to improve team communication: The official voice of perioperative nursing the official voice of perioperative nursing. *AORN Journal, 104,* 206-216. doi:10.1016/j.aorn.2016.06.019

Campione, J., & Famolaro, T. (2018). Promising practices for improving hospital patient safety culture. *The Joint Commission Journal on Quality and Patient Safety, 44*(1)*,* 23-32. doi:10.1016/j.jcjq.2017.09.001

Carayon, P., Hancock, P., Leveson, N., Noy, I., Sznelwar, L., & Van Hootegem, G. (2015). Advancing a sociotechnical systems approach to workplace safety – developing the conceptual framework. *Ergonomics, 58,* 548-564.

doi:10.1080/00140139.2015.1015623

Carr, E. C., & Worth, A. (2001). The use of the telephone interview for research. *NT Research, 6*(1)*,* 511-524. doi:10.1177/136140960100600107

Castillo-Montoya, M. (2016). Preparing for interview research: The interview protocol refinement framework. *The Qualitative Report, 21*(5)*,* 811-831. Retrieved from http://www.nsuworks.nova.edu

Castleberry, A. (2014). NVivo 10 [Software program]. Version 10. QSR International; 2012. *American Journal of Pharmaceutical Education, 78*(1)*,* 25. doi:10.5688/ajpe78125

Cechini, M., Bedini, R., Mosetti, D., Marino, S., & Stasi, S. (2018). Safety knowledge and changing behavior in agricultural workers: An assessment model applied in Central Italy. *Safety and Health at Work, 9,* 164-171. doi:10.1016/j.shaw.2017.07.009

Chadwick, I. C., & Raver, J. L. (2015). Motivating organizations to learn: Goal orientation and its influence on organizational learning. *Journal of Management, 41,* 957-986. doi:10.1177/0149206312443558

Chen, D., & Tian, H. (2012). Behavior based safety for accidents prevention and positive study in China construction project. *Procedia Engineering, 43,* 528-534. doi:10.1016/j.proeng.2012.08.092

Cherrafi, A., Elfezazi, S., Chiarini, A., Mokhlis, A., & Benhida, K. (2016). The integration of lean manufacturing, Six Sigma and sustainability: A literature

review and future research directions for developing a specific model. *Journal of Cleaner Production, 139,* 828-846. doi:10.1016/j.jclepro.2016.08.101

Cheung, J. M., Bartlett, D. J., Armour, C. L., Laba, T. L., & Saini, B. (2018). To drug or not to drug: A qualitative study of patients' decision-making processes for managing insomnia. *Behavioral Sleep Medicine, 16*(1)*,* 1-26. doi:10.1080/15402002.2016.1163702

Chikono, N. N. (2017). *Leadership practices that improve the workplace safety environment* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 10259015)

Chinniah, Y. (2015). Analysis and prevention of serious and fatal accidents related to moving parts of machinery. *Safety Science, 75,* 163-173. doi:10.1016/j.ssci.2015.02.004

Choudhry, R. M. (2014). Behavior-based safety on construction sites: A case study. *Accident Analysis & Prevention, 70,* 14-23. doi:10.1016/j.aap.2014.03.007

Chughtai, A. A. (2015). Creating safer workplaces: The role of ethical leadership. *Safety Science, 73,* 92-98. doi:10.1016/j.ssci.2014.11.016

Connelly, L. M. (2016). Trustworthiness in qualitative research. *Medsurg Nursing, 25*(6)*,* 435-436. Retrieved from http://www.ijmsn.ir

Cox, D. D., & McLeod, S. (2014). Social media marketing and communications strategies for school superintendents. *Journal of Educational Administration, 52,* 850-868. doi:10.1108/JEA-11-2012-0117

Crow, G., Wiles, R., Heath, S., & Charles, V. (2006). Research ethics and data quality:

The implications of informed consent. *International Journal of Social Research Methodology, 6,* 83-95. doi:10.1080/13645570600595231

Dasborough, M., Lamb, P., & Suseno, Y. (2015). Understanding emotions in higher education change management. *Journal of Organizational Change Management, 28,* 579-590. doi:10.1108/JOCM-11-2013-0235

De Camp, W., & Herskovitz, K. (2015). The theories of accident causation. In *Security Supervision and Management, (4th ed.).* 71-78. doi:10.1016/B978-0-12-800113-4.00005-5

De Cordova, P. B., Bradford, M. A., & Stone, P. W. (2016). Increased errors and reduced performance at night: A systematic review of the evidence concerning shift work and quality. *Work, 53,* 825-834. doi:10.3233/WOR-16225

Dempsey, L., Dowling, M., Larkin, P., & Murphy, K. (2016). Sensitive interviewing in qualitative research. *Research in Nursing & Health, 39,* 480-490. doi:10.1002/nur.21743

DePasquale, J. P., & Geller, E. S. (1999). Critical success factors for behavior-based safety: A study of twenty industry-wide applications. *Journal of Safety Research, 30,* 237-249. Retrieved from http://158.132.155.107/posh97/private/behavioral-safety/critical-factors-DePasquale.pdf

Dikko, M. (2016). Establishing construct validity and reliability: Pilot testing of a qualitative interview for research in takaful (Islamic insurance). *The Qualitative Report, 21,* 521-528. Retrieved from http://www.nsuworks.nova.edu/tqr/vol21/iss3/6

Dobbins, R. (1996). The practicum: A learning journey. *Waikato Journal of Education, 2,* 59-72. doi:10.15663/wje.v2i1.508

Doody, O., & Doody, C. M. (2015). Conducting a pilot study: Case study of a novice researcher. *British Journal of Nursing, 24,* 1074-1078. doi:10.12968/bjon.2015.24.21.1074

Dragano, N., Lunau, T., Eikemo, T. A., Toch-Marquardt, M., van der Wel, K. A., & Bambra, C. (2015). Who knows the risk? A multilevel study of systematic variations in work-related safety knowledge in the European workforce. *Occup Environ Med, 72,* 553-559. doi:10.1136/oemed-2014-102402

Draper, J. (2015). Ethnography: Principles, practice and potential. *Nursing Standard, 29,* 36-41. doi:10.7748/ns.29.36.36.e8937

Driessen, E., Van Der Vleuten, C., Schuwirth, L., Van Tartwijk, J., & Vermunt, J. D. H. M. (2005). The use of qualitative research criteria for portfolio assessment as an alternative to reliability evaluation: A case study. *Medical Education, 39,* 214-220. doi:10.1111/j.1365-2929.2004.02059.x

Drudi, D. (2015). The quest for meaningful and accurate occupational health and safety statistics. *Monthly Labor Review*, *138*, 1-19. Retrieved from http://www.bls.gov

Dumez, H. (2015). What is a case, and what is a case study? *Bulletin of Sociological Methodology, 127*(1)*,* 43–57. doi:10.1177/0759106315582200

Embleton, L., Ott, M. A., Wachira, J., Naanyu, V., Kamanda, A., Makori, D., ... & Braitstein, P. (2015). Adapting ethical guidelines for adolescent health research to street-connected children and youth in low-and middle-income countries: A case

study from western Kenya. *BMC Medical Ethics, 16*(1)*,* 1-11. doi:10.1186/s12910-015-0084-y

Ergai, A., Cohen, T., Sharp, J., Wiegmann, D., Gramopadhye, A., & Shappell, S. (2016). Assessment of the human factors analysis and classification system (HFACS): Intra-rater and inter-rater reliability. *Safety Science, 82,* 393-398. Retrieved from http://www.tigerprints.clemson.edu

Etikan, I., Musa, S. A., & Alkassim, R. S. (2015). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1)*, 1*-4. doi:10.11648/j.ajtas.20160501.11

Fang, D., Wu, C., & Wu, H. (2015). Impact of the supervisor on worker safety behavior in construction projects. *Journal of Management in Engineering, 31,* 04015001-04015001-12. doi:10.1061/(ASCE)ME.1943-5479.0000355

Federal Aviation Administration. (2019). *Safety management system,* What is a safety management system (SMS)? Retrieved from http://www.faa.gov/about/initiatives/sms

Feng, Y., Bruhn, C., & Marx, D. (2016). Evaluation of different food safety education interventions. *British Food Journal, 118,* 762-776. doi:10.1108/BFJ-10-2015-0372

Feng, Y., Zhang, S., & Wu, P. (2015). Factors influencing workplace accident costs of building projects. *Safety Science, 72,* 97-104. doi:10.1016/j.ssci.2014.08.008

Ferrell, R. (1977). *Proceedings of the art conference in safety management concepts*. Washington, DC: The National Safety Management Society Washington.

Fujimoto, Y., & EJ Härtel, C. (2017). Organizational diversity learning framework: Going beyond diversity training programs. *Personnel Review, 46*(6)*,* 1120-1141. Retrieved from http://www.eprints.sunway.edu

Fusch, G. E., & Ness, L. R. (2017). How to conduct a mini-ethnographic case study: A guide for novice researchers. *The Qualitative Report, 22*(3)*,* 923-941. Retrieved from http://www.nsuworks.nova.edu

Fusch, P., & Ness, L. (2015). Are we there yet? Data saturation in qualitative research. *Qualitative Report, 20,* 1394-1407. Retrieved from http://www.tqr.nova.edu

Galvin, R. (2015). How many interviews are enough? Do qualitative interviews in building energy consumption research produce reliable knowledge? *Journal of Building Engineering, 1,* 2-12. doi:10.1016/j.jobe.2014.12.001

Gehman, J., Glaser, V. L., Eisenhardt, K. M., Gioia, D., Langley, A., & Corley, K. G. (2018). Finding theory-method fit: A comparison of three qualitative approaches to theory building. *Journal of Management Inquiry*. doi:10.1177/1056492617706029

Geller, E. S. (2005). Behavior-based safety and occupational risk management. *Behavior Modification, 29,* 539-561. doi:10.1177/0145445504273287

Gelling, L. (2016). Qualitative research. *Nursing Standards, 29,* 43-47. doi:10.7748/ns.29.30.43.e9749

Gentles, S. J., Charles, C., Ploeg, J., & McKibbon, K. A. (2015). Sampling in qualitative research: Insights from an overview of the methods literature. *The Qualitative Report, 20*(11)*,* 1772-1789. Retrieved from http://www.nsuworks.nova.edu

Gergen, K. J., Josselson, R., & Freeman, M. (2015). The promises of qualitative inquiry. *American Psychologist, 70*(1)*,* 1-9. doi:10.1037/a0038597

Gianni, M., & Gotzamani, K. (2015). Management systems integration: Lessons from an abandonment case. *Journal of Cleaner Production, 86,* 265-276. doi:10.1016/j.jclepro.2014.08.023

Giles, E. L., Sniehotta, F. F., McColl, E., & Adams, J. (2016). Acceptability of financial incentives for health behaviour change to public health policymakers: A qualitative study. *BMC Public Health, 16*(1)*,* 989-1000. doi:10.1186/s12889-016-3646-0

Goldstein, T., Gray, J., Salisbury, J., & Snell, P. (2014). When qualitative research meets theater: The complexities of performed ethnography and research-informed theater project design. *Qualitative Inquiry, 20,* 674-685. doi:10.1177/1077800413513738

Goode, N., Salmon, P. M., Lenné, M. G., & Finch, C. F. (2015). Looking beyond people, equipment and environment: Is a systems theory model of accident causation required to understand injuries and near misses during outdoor activities? *Procedia Manufacturing, 3,* 1125-1131. doi:10.1016/j.promfg.2015.07.188

Gorichanaz, T., & Latham, K. F. (2016). Document phenomenology: A framework for holistic analysis. *Journal of Documentation, 72,* 1114-1133. doi:10.1108/JD-01-2016-0007

Grady, D. C., Cummings, S. R., Rowbotham, M. C., McConnell, M. V., Phil, D., &

Kang, G. (2017). Informed consent. *New England Journal of Medicine, 376,* 856-867. doi:10.1056/nejmra1603773

Gratch, J., Artstein, R., Lucas, G. M., Stratou, G., Scherer, S., Nazarian, A., ... & Traum, D. R. (2014, May). The distress analysis interview corpus of human and computer interviews. *LREC,* 3123-3128. Retrieved from http://www.citeseerx.ist.psu.edu

Gravina, N., Cummins, B., & Austin, J. (2017). Leadership's role in process safety: An understanding of behavioral science among managers and executives is needed. *Journal of Organizational Behavior Management, 37,* 316-331. doi:10.1080/01608061.2017.1340925

Greiner, B. (2015). Subject pool recruitment procedures: organizing experiments with ORSEE. *Journal of the Economic Science Association, 1*(1)*,* 114-125. doi:10.1007/s40881-015-0004-4

Griffin, M., & Curcuruto, M. (2016). Safety climate in organizations. *The Annual Review of Organizational Psychology and Organizational Behavior, 3*(1)*,* 191-212. Retrieved from http://www.leedbeckett.ac.uk

Grossoehme, D. (2014). Research methodology: Overview of qualitative research. *Journal of Health Care Chaplaincy, 20,* 109-122. doi:10.1080/08854726.2014.925660

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1)*,* 59-82. doi:10.1177/1525822X05279903

Guo, B. H., Goh, Y. M., & Wong, K. L. X. (2018). A system dynamics view of a

behavior-based safety program in the construction industry. *Safety Science, 104,* 202-215. doi:10.1016/j.ssci.2018.01.014

Guo, B. H., Yiu, T. W., & González, V. A. (2016). Predicting safety behavior in the construction industry: Development and test of an integrative model. *Safety Science, 84,* 1-11. doi:10.1016/j.ssci.2015.11.020

Gyunka, B. A., & Christiana, A. O. (2017). Analysis of human factors in cyber security: A case study of anonymous attack on Hbgary. *Computing & Information Systems, 21*(2)*,* 10-18. Retrieved from www.researchgate.net

Haas, E. J., & Hoebbel, C. L. (2018). *Filling in the "Whys" of Quantitative Data: The Roles of Non-Research and Reflexivity in Applied Safety Climate Research*. SAGE Publications.

Haider, M., Rasli, A., Akhtar, S., Yusoff, R., Malik, O., Aamir, A., ... & Tariq, F. (2015). The impact of human resource practices on employee retention in the telecom sector. *International Journal of Economics and Financial Issues, 5*(1S)*,* 63-69. Retrieved from http://www.econjournals.com

Haines, S. J., Summers, J. A., Turnbull, A. P., Turnbull, H. R., & Palmer, S. (2015). Fostering Habib's engagement and self-regulation a case study of a child from a refugee family at home and preschool. *Topics in Early Childhood Special Education, 35*(1)*,* 28-39. doi:10.1177/0271121414552905

Hale, A., Borys, D., & Adams, M. (2015). Safety regulation: The lessons of workplace safety rule management for managing the regulatory burden. *Safety Science, 71,* 112-122. doi:10.1016/j.ssci.2013.11.012

Hammarberg, K., Kirkman, M., & De Lacey, S. (2016). Qualitative research methods: When to use them and how to judge them. *Human Reproduction, 31,* 498-501. doi:10.1093/humrep/dev334

Hanaysha, J. (2016). Testing the effects of employee empowerment, teamwork, and employee training on employee productivity in higher education sector. *International Journal of Learning and Development, 6*(1)*,* 164-178. doi:10.5296/ ijld.v6i1.9200

Harf, A., Skandrani, S., Sibeoni, J., Pontvert, C., Revah-Levy, A., & Moro, M. R. (2015). Cultural identity and internationally adopted children: Qualitative approach to parental representations. *PloS One, 10,* 11963-11963. doi:10.1371/journal.pone.0119635

Harper, M., & Cole, P. (2012). Member checking: Can benefits be gained similar to group therapy? *The Qualitative Report, 17*(2)*,* 510-517. Retrieved from http://www.nsuworks.nova.edu

Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. *Quality Social Research, 18*(1)*,* 1-17. doi:10.17169/fqs-18.1.2655

Harvey, L. (2015). Beyond member-checking: A dialogic approach to the research interview. *International Journal of Research & Method in Education, 38*(1)*,* 23-38. doi:10.1080/1743727X.2014.914487

Hassan, S. (2016). Impact of HRM practices on employee's performance. *International Journal of Academic Research in Accounting, Finance and Management*

*Sciences, 6*(1)*,* 15-22. doi:10.6007/IJARAFMS/v6-i1/195

Hedlund, A., Gummesson, K., Rydell, A., & Andresson, I. M. (2015). Safety motivation at work: Evaluation of changes from six interventions. *Safety Science, 82,* 155-163. doi:10.1016/j.ssci.2015.09.006

Heinrich, H. W. (1931). *Industrial accident prevention: A scientific approach.* 1st ed. New York, NY: McGraw-Hill.

Heinrich, H. W. (1959). *Industrial accident prevention: A scientific approach.* 4th ed. New York, NY: McGraw-Hill.

Heinrich, H. W., Petersen, D., & Roos, N. R. (1980). Industrial accident prevention: A safety management approach*. Journal of Safety Research, 39*(5)*,1409-1507.* New York, NY: McGraw-Hill.

Helleno, A. L., de Moraes, A. J. I., & Simon, A. T. (2017). Integrating sustainability indicators and lean manufacturing to assess manufacturing processes: Application case studies in Brazilian industry. *Journal of Cleaner Production, 153,* 405-416. doi:10.1016/j.jclepro.2016.12.072

Henriksen, R. C., Jr., Polonyi, M. A., Bornsheuer-Boswell, J. N., Greger, R. G., & Watts, R. E. (2015). Counseling students' perceptions of religious/spiritual counseling training: A qualitative study. *Journal of Counseling & Development, 93*(1)*,* 59-69. doi:10.1002/j.1556-6676.2015.00181.x

Herrero, S. G., Saldaña, M. A. M., del Campo, M. A. M., & Ritzel, D. O. (2002). From the traditional concept of safety management to safety integrated with quality. *Journal of Safety Research, 33,* 1-20. Retrieved from

http://158.132.155.107/posh97/private/culture/integrated-Herrero.pdf

Hersey, R. (1932). Worker's emotions in shop and home. Philadelphia, PA: University of Pennsylvania Press.

Hibbler, D. K., & Shinew, K. J. (2002). Interracial couples' experience of leisure: A social network approach. *Journal of Leisure Research, 34*(2)*,* 135-156. Retrieved from http://www.via.library.depaul.edu

Hofisi, C., Hofisi, M., & Mago, S. (2014). Critiquing interviewing as a data collection method. *Mediterranean Journal of Social Sciences, 6,* 60-64. doi:10.5901/mjss.2014.v5nn16p60

Hofmann, D. A., Burke, M. J., & Zohar, D. (2017). 100 years of occupational safety research: From basic protections and work analysis to a multilevel view of workplace safety and risk. *Journal of Applied Psychology, 102,* 375-388. doi:10.1037/apl0000114

Holizki, T., McDonald, R., & Gagnon, F. (2015). Patterns of underlying causes of work-related traumatic fatalities–Comparison between small and larger companies in British Columbia. *Safety Science, 71,* 197-204. doi:10.1016/j.ssci.2014.06.008

Hollenbeck, K. (2015). *Promoting retention or reemployment of workers after a significant injury or illness*. Washington, DC: Mathematica Policy Research.

Honarpour, A., Jusoh, A., & Md Nor, K. (2018). Total quality management, knowledge management, and innovation: An empirical study in R&D units. *Total Quality Management & Business Excellence, 29*(7-8)*,* 798-816. doi:10.1080/14783363.2016.1238760

Hosseinian, S. S., & Torghabeh, Z. J. (2012). Major theories of construction accident causation models: A literature review. *International Journal of Advances in Engineering & Technology, 4*(2)*,* 53-66. Retrieved from www.researchgate.net

Houghton, C., Murphy, K., Shaw, D., & Casey, D. (2015). Qualitative case study data analysis: An example from practice. *Nurse Researcher, 22*(5)*,* 8-12. Retrieved from http://www. journals.rcni.com

Howton, J., Keifer, E., Murphy, C. A., Sirsat, S. A., O'Bryan, C. A., Ricke, S. C., ... & Neal, J. A. (2016). A comparison of food safety programs using the customizable tool for online training evaluation. *Food Control, 59,* 82-87. doi:10.1016/j.foodcont.2015.04.034

Hoyme, K. (2015). Let's ID and nurture systems thinkers. *Biomedical Instrumentation & Technology, 49,* 144. doi:10.2345/0899-8205-49.2.144

Huang, Y. H., Lee, J., McFadden, A. C., Murphy, L. A., Robertson, M. M., Cheung, J. H., ... & Zohar, D. (2016). Beyond safety outcomes: An investigation of the impact of safety climate on job satisfaction, employee engagement and turnover using social exchange theory as the theoretical framework. *Applied Ergonomics, 55,* 248-257. doi:10.1016/j.apergo.2015.10.007

Hubbard, S. M., & Lopp, D. (2015). An integrated framework for fostering human factor sustainability and increased safety in aviation ramp operations. *Journal of Aviation Technology and Engineering, 5*(1)*,* 44-52. doi:10.7771/2159-6670.1113

Hughes, B. P., Newstead, S., Anund, A., Shu, C. C., & Falkmer, T. (2015). A review of models relevant to road safety. *Accident Analysis & Prevention, 74,* 250-270.

doi:10.1016/j.aap.2014.06.003

Hussein, A. (2015). The use of triangulation in social sciences research: May qualitative and quantitative methods be combined? *Journal of Comparative Social Work, 4*(1)*,* 1-12. Retrieved from http://www.journal.uia.no

Jaca, C., & Psomas, E. (2015). Total Quality Management practices and performance outcomes in Spanish service companies. *Total Quality Management & Business Excellence, 26*(9-10)*,* 958-970. doi:10.1080/14783363.2015.1068588

Jacob, S. A., & Furgerson, S. P. (2012). Writing interview protocols and conducting interviews: Tips for students new to the field of qualitative research. *Qualitative Report, 17*(6)*,* 1-10. Retrieved from http://www.nova.edu

Jacobs, B. W., Swink, M., & Linderman, K. (2015). Performance effects of early and late Six Sigma adoptions. *Journal of Operations Management, 36,* 244-257. doi:10.1016/j.jom.2015.01.002

Jain, A. K., & Moreno, A. (2015). Organizational learning, knowledge management practices and firm's performance: An empirical study of a heavy engineering firm in India. *The Learning Organization, 22*(1)*,* 14-39. doi:10.1108/TLO-05-2013-0024

Janghorban, R., Roudsari, R. L., & Taghipour, A. (2014). Skype interviewing: The new generation of online synchronous interview in qualitative research. *International Journal of Qualitative Studies on Health and Well-Being, 9*(1)*,* 1-4. doi:10.3402/qhw.v9.24152

Jasiulewicz-Kaczmarek, M., Szwedzka, K., & Szczuka, M. (2015). Behaviour based

intervention for occupational safety–case study. *Procedia Manufacturing, 3,* 4876- 4883. doi:10.1016/j.promfg.2015.07.615

Javaid, M. U., Isha, A. S. N., Ghazali, Z., & Langove, N. (2016). Psychosocial stressors in relation to unsafe acts. *International Review of Management and Marketing, 6*(4S)*,* 108-113. Retrieved from www.econjournals.com

Jazayeri, E., & Dadi, G. B. (2017). Construction safety management systems and methods of safety performance measurement: A review. *Journal of Safety Engineering, 6,* 15-28. doi:10.5923/j.safety.20170602.01

Jehanzeb, K., Hamid, A. B. A., & Rasheed, A. (2015). What is the role of training and job satisfaction on turnover intentions? *International Business Research, 8,* 208-220. doi:10.5539/ibr.v8n3p20

Jetzek, T. (2016). Managing complexity across multiple dimensions of liquid open data: The case of the Danish basic data program. *Government Information Quarterly, 33*(1)*,* 89-104. doi:10.1016/j.giq.2015.11.003

Jitwasinkul, B., Hadikusumo, B. H., & Memon, A. Q. (2016). A Bayesian belief network model of organizational factors for improving safe work behaviors in Thai construction industry. *Safety Science, 82,* 264-273. doi:10.1016/j.ssci.2015.09.027

Johnson, A. E., Pollard, T. J., Shen, L., Li-wei, H. L., Feng, M., Ghassemi, M., ... & Mark, R. G. (2016). MIMIC-III, a freely accessible critical care database. *Scientific Data, 3,* 1-9. doi:10.1038/sdata.2016.35

Jonathan, G. K., & Mbogo, R. W. (2016). Maintaining health and safety at workplace: Employee and employer's role in ensuring a safe working environment. *Journal of*

*Education and Practice, 7*(29)*,* 1-7. Retrieved from http://www.iiste.org

Jong, Y. O., & Jung, C. K. (2015). The development of interview techniques in language studies: Facilitating the researcher's views on interactive encounters. *English Language Teaching, 8,* 30-39. doi:10.5539/elt.v8n7p30

Joslin, R., & Müller, R. (2016). Identifying interesting project phenomena using philosophical and methodological triangulation. *International Journal of Project Management, 34,* 1043-1056. doi:10.1016/j.ijproman.2016.05.005

Jouhari, Z., Haghani, F., & Changiz, T. (2015). Factors affecting self-regulated learning in medical students: A qualitative study. *Medical Education Online, 20*(1)*,* 1-9. doi:10.3402/meo.v20.28694

Kabir, Q. S., Watson, K., & Somaratna, T. (2018). Workplace safety events and firm performance. *Journal of Manufacturing Technology Management, 29*(1)*,* 104-120. doi:10.1108/JMTM-07-2017-0133

Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing, 72,* 2954-2965. doi:10.1111/jan.13031

Karatepe, O. M. (2015). Do personal resources mediate the effect of perceived organizational support on emotional exhaustion and job outcomes? *International Journal of Contemporary Hospitality Management, 27*(1)*,* 4-26. doi:10.1108/IJCHM-09-2013-0417

Kark, R., Katz-Navon, T., & Delegach, M. (2015). The dual effects of leading for safety:

The mediating role of employee regulatory focus. *Journal of Applied Psychology, 100,* 1332-1348. doi:10.1037/a0038818

Katz, J. (2015) A theory of qualitative methodology: The social system of analytic fieldwork. *African Review of Social Sciences Methodology, 1*(1-2)*,* 131-146. doi:10.1080/23754745.2015.1017282

Kaynak, R., Alci, M., Toklu, A., & Toklu, I. T. (2016). Effects of occupational health and safety practices on organizational commitment, work alienation, and job performance: Using the PLS-SEM approach. *International Journal of Business and Management, 11,* 146-166. doi:10.5539/ijbm.v11n5p146

Kellogg, P. U. (1909). *The Pittsburgh survey*. New York, NY: Russell Sage Foundation.

Kemparaj, V. M., Panchmal, G. S., Jayakumar, H. L., & Kadalur, U. G. (2016). Qualitative assessment of ethical issues in dental practice: An expert opinion. *Journal of Education and Ethics in Dentistry, 6*(1)*,* 20-26. Retrieved from http://www.jeed.in

Khanam, S., Siddiqui, J., & Talib, F. (2016). Role of information technology in Total Quality Management: A literature review. *International Journal of Advanced Research in Computer Engineering & Technology, 2*(8)*,* 2433-2445. Retrieved from http://www.ijarcet.org

Kim, W. K., Park, S. J., Lim, H. S., & Cho, H. H. (2017). Safety climate and occupational stress according to occupational accidents experience and employment type in shipbuilding industry of Korea. *Safety and Health at Work, 8,* 290-295. doi:10.1016/j.shaw.2017.08.002

Kim, Y., Park, J., & Park, M. (2016). Creating a culture of prevention in occupational safety and health practice. *Safety and Health at Work, 7,* 89-96. doi:10.1016/j.shaw.2016.02.002

Klement, P. (2018). Error management in the German armed forces' military aviation. In Hagen J. (eds.). *How Could This Happen?* (pp. 211-231). Palgrave Macmillan, Cham.

Kline, T. J. B. (2017). Sample issues, methodological implications, and best practices. *Canadian Journal of Behavioural Science, 49,* 71-77. doi:10.1037/cbs0000054

Koehn, E. E., & Datta, N. K. (2003). Quality, environmental, and health and safety management systems for construction engineering. *Journal of Construction Engineering and Management, 129,* 562-569. doi:10.1061/(ASCE)0733-9364(2003)129:5(562)

Kornbluh, M. (2015). Combatting challenges to establishing trustworthiness in qualitative research. *Qualitative Research in Psychology, 12,* 397-414. doi:10.1080/14780887.2015.1021941

Kouabenan, D. R., Ngueutsa, R., & Mbaye, S. (2015). Safety climate, perceived risk, and involvement in safety management. *Safety Science, 77,* 72-79. doi:10.1016/j.ssci.2015.03.009

Krishnan, S., Hizam, S. M., Saffian, A. K. M., Baharun, N. A. Z., & Azman, N. (2017). Safety at workplace enhance productivity. *Human Resource Management Research, 7*(1)*,* 33-37. doi:10.5923/j.hrmr.20170701.04

Kristensen, S., Hammer, A., Bartels, P., Suñol, R., Groene, O., Thompson, C. A., ... & Wagner, C. (2015). Quality management and perceptions of teamwork and safety climate in European hospitals. *International Journal for Quality in Health Care, 27,* 499-506. doi:10.1093/intqhc/mzv079

Kukla, M., Rattray, N. A., & Salyers, M. P. (2015). Mixed methods study examining work reintegration experiences from perspectives of Veterans with mental health disorders. *Journal of Rehabilitation Research & Development, 52,* 477- 490. doi:10.1682/JRRD.2014.11.0289

Kumar, P., Gupta, S., Agarwal, M., & Singh, U. (2016). Categorization and standardization of accidental risk-criticality levels of human error to develop risk and safety management policy. *Safety Science, 85,* 88-98. doi:10.1016/j.ssci.2016.01.007

Kunyk, D., Craig-Broadwith, M., Morris, H., Diaz, R., Reisdorfer, E., & Wang, J. (2016). Employers' perceptions and attitudes toward the Canadian national standard on psychological health and safety in the workplace: A qualitative study *International Journal of Law and Psychiatry, 44,* 41-47. doi:10.1016/j.ijlp.2015.08.030

Kvalheim, S. A., & Dahl, O. (2016). Safety compliance and safety climate: A repeated cross-sectional study in the oil and gas industry. *Journal of Safety Research, 59,* 33-41. doi:10.1016/j.jsr.2016.10.006

Lay, A. M., Saunders, R., Lifshen, M., Breslin, F. C., LaMontagne, A. D., Tompa, E., & Smith, P. M. (2017). The relationship between occupational health and safety

vulnerability and workplace injury. *Safety Science, 94,* 85-93. doi:10.1016/j.ssci.2016.12.021

Legg, S. J., Olsen, K. B., Laird, I. S., & Hasle, P. (2015). Managing safety in small and medium enterprises. *Safety Science, 71,* 189-196. doi:10.1016/j.ssci.2014.11.007

Leichsenring, F., Abbass, A., Hilsenroth, M. J., Leweke, F., Luyten, P., Keefe, J. R., . . . Steinert, C. (2017). Biases in research: Risk factors for non-replicability in psychotherapy and pharmacotherapy research. *Psychological Medicine, 47,* 1000-1011. doi:10.1017/S003329171600324X

Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care, 4,* 324-327. doi:10.4103/2249-4863.161306

Leveson, N. (2015). A systems approach to risk management through leading safety indicators. *Reliability Engineering & System Safety, 136,* 17-34. doi:10.1016/j.ress.2014.10.008

Lewis, R. (2016). Radon in the workplace: The occupational safety and health administration (OSHA) ionizing radiation standard. *Health Physics, 111,* 374–380. doi:10.1097/HP.0000000000000553

Lewis, S. (2015). Qualitative inquiry and research design: Choosing among five approaches. *Health Promotion Practice, 16,* 473-475. doi:10.1177/1524839915580941

Li, J., & Yu, L. (2015). Reward and punishment mechanism in a vertical safety regulation System: A transferred prisoner's dilemma. *Modern Economy, 6,* 552-562.

doi:10.4236/me.2015.65054

Li, Lu, Hsu, Gray, & Huang (2015). Proactive behavior-based safety management for construction safety improvement. *Safety Science, 75,* 107-117. doi:10.1016/j.ssci.2015.01.013

Li, W., Zhang, L., & Liang, W. (2017). An accident causation analysis and taxonomy (ACAT) model of complex industrial system from both system safety and control theory perspectives. *Safety Science, 92,* 94-103. doi:10.1016/j.ssci.2016.10.001

Liberty Mutual Research Institute for Safety Index. (2017). *Liberty mutual workplace safety index.* Retrieved from http://www.libertymutualgroup.com/about-liberty-mutual-site/news-site/Pages/2017-Liberty-Mutual-Workplace-Safety-Index.aspx

Liepė, Ž., & Sakalas, A. (2015). The three-loop learning model appliance in new product development. *Engineering Economics, 58*(3)*,* 73-80. Retrieved from http://www.inzeko.ktu.lt

Linderman, K., Schroeder, R. G., Zaheer, S., & Choo, A. S. (2003). Six Sigma: A goal-theoretic perspective. *Journal of Operations Management, 21,* 193-203. doi:10.1016/S0272-6963(02)00087-6

Liu, X., Huang, G., Huang, H., Wang, S., Xiao, Y., & Chen, W. (2015). Safety climate, safety behavior, and worker injuries in the Chinese manufacturing industry. *Safety Science, 78,* 173-178. doi:10.1016/j.ssci.2015.04.023

Lo, C. K., Pagell, M., Fan, D., Wiengarten, F., & Yeung, A. C. (2014). OHSAS 18001 certification and operating performance: The role of complexity and coupling. *Journal of Operations Management, 32,* 268-280. doi:10.1016/j.jom.2014.04.004

Loyola University Chicago Institutional Review Board. (2019). *Letters of Cooperation, Requirements for Letters of Cooperation*. Retrieved from http://www.luc.edu

Lub, V. (2015). Validity in qualitative evaluation: Linking purposes, paradigms, and perspectives. *International Journal of Qualitative Methods, 14,* 1-8. doi:10.1177/1609406915621406

Luther, K., Snook, B., Barron, T., & Lamb, M. E. (2015). Child interviewing practices in Canada: A box score from field observations. *Journal of Police and Criminal Psychology, 30,* 204-212. doi:10.1007/s11896-014-9149-y

Lyndon, A., Johnson, M. C., Bingham, D., Napolitano, P. G., Joseph, G., Maxfield, D. G., & O'Keeffe, D. F. (2015). Transforming communication and safety culture in intrapartum care: A multi-organization blueprint. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 44,341-349.* doi:10.1111/jmwh.12235

Lyu, S., Hon, C., Chan, A., Wong, F., & Javed, A. (2018). Relationships among safety climate, safety behavior, and safety outcomes for ethnic minority construction workers. *International Journal of Environmental Research and Public Health, 15,* 484-500. doi:10.3390/ijerph15030484

MacQueen, K. M., & Milstein, B. (1999). A systems approach to qualitative data management and analysis. *Field Methods, 11*(1)*,* 27-39. doi:10-1177/1525822X9901100103

Majid, F. A. (2016). The use of reflective journals in outcome-based education during the teaching practicum. *Malaysian Journal of ELT Research, 4*(1)*,* 32-42. Retrieved from http://www.melta.org.my

Makrakis, V., & Kostoulas-Makrakis, N. (2016). Bridging the qualitative–quantitative divide: Experiences from conducting a mixed methods evaluation in the RUCAS programme. *Evaluation and Program Planning, 54,* 144–151. doi:10.1016/j.evalprogplan.2015.07.008

Mansour, M. (2016). Quantifying the intangible costs related to non-ergonomic work conditions and work injuries based on the stress level among employees. *Safety Science, 82,* 283-288. doi:10.1016/j.ssci.2015.09.007

Mariotto, F. L., Zanni, P. P., & Moraes, G. H. S. (2014). What is the use of a single-case study in management research? *Revista de Administração de Empresas, 54,* 358-369. doi:10.1590/S0034-759020140402

Marshall, B., Cardon, P., Poddar, A., & Fontenot, R. (2013). Does sampling size matter in qualitative research? A review of qualitative interviews in IS research. *Journal of Computer Information Systems, 54*(1)*,* 11-22. Retrieved from http://www.iacis.org

Martin, A., Karanika-Murray, M., Biron, C., & Sanderson, K. (2016). The psychosocial work environment, employee mental health and organizational interventions: Improving research and practice by taking a multilevel approach. *Stress and Health, 32,* 201-215. doi:10.1002/smi.2593

Mashi, M. S., Subramaniama, C., & Johari, J. (2016). The effect of safety training and workers involvement on healthcare workers safety behavior: The moderating role of consideration of future safety consequences. *International Journal of Business Management (IJBM), 1*(2)*,* 46-81. Retrieved from http://www.researchgate.net

Matamonasa-Bennett, A. (2015). A disease of the outside people: Native American men's perceptions of intimate partner violence. *Psychology of Women Quarterly, 39*(1)*,* 20-36. doi:10.1177/0361684314543783

Matua, G. A., & Van Der Wal, D. M. (2015). Differentiating between descriptive and interpretive phenomenological research approaches. *Nurse Researcher, 22,* 22-27. doi:10.7748/nr.22.6.22.e1344

McClymer, J. F. (1974). The Pittsburgh Survey, 1907-1914: Forging an ideology in the steel district. *Pennsylvania History, 41*(2)*,* 169-187. Retrieved from http://www.journals.psu.edu

McGregor, K. A., Hensel, D. J., Waltz, A. C., Molnar, E. E., & Ott, M. A. (2017). Adolescent sexual behavior research: Perspectives of investigators, IRB members, and IRB staff about risk categorization and IRB approval. *IRB, 39*(4)*, 17-20*. Retrieved from http://www.ncbi.nlm.nih.gov

McIntosh, M. J., & Morse, J. M. (2015). Situating and constructing diversity in semi-structured interviews. *Global Qualitative Nursing Research, 2,* 1-12. doi:10.1177/2333393615597674

McKim, C. A. (2017). The value of mixed methods research: A mixed methods study. *Journal of Mixed Methods Research, 11,* 202-222. doi:10.1177/1558689815607096

Mcknight, P. A. (2018). *Strategies small construction business managers use to reduce safety incidents in their organization*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 10844456)

Mealer, M., & Jones, J. (2014). Methodological and ethical issues related to qualitative telephone interviews on sensitive topics. *Nurse Researcher, 21,* 32–37. doi:10.7748/nr2014.03.21.4.32.e1229

Menger, L., Rosecrance, J., Stallones, L., & Roman-Muniz, I. (2016). A guide to the design of occupational safety and health training for immigrant, Latino/a dairy workers. *Frontiers in Public Health, 4,* 1-11. doi:10.3389/fpubh.2016.00282

Mills, J., Harrison, H., Franklin, R., & Birks, M. (2017). Case study research: Foundations and methodological orientations. *Qualitative Social Research, 18*(1), 1-17. doi:10.17169/fqs-18.1.2655

Moatari-Kazerouni, A., Chinniah, Y., & Agard, B. (2015). A proposed occupational health and safety risk estimation tool for manufacturing systems. *International Journal of Production Research, 53,* 4459-4475. doi:10.1080/00207543.2014.942005

Mohammadfam, I., Ghasemi, F., Kalatpour, O., & Moghimbeigi, A. (2017). Constructing a Bayesian network model for improving safety behavior of employees at workplaces. *Applied Ergonomics, 58,* 35-47. doi:10.1016/j.apergo.2016.05.006

Morgan, S., Pullon, S., & McKinlay, E. (2015). Observation of interprofessional collaborative practice in primary care teams: An integrative literature review. *International Journal of Nursing Studies, 52,* 1217-1230. doi:10.1016/j.ijnurstu.2015.03.008

Morse, A. L., & McEvoy, C. D. (2014). Qualitative research in sport management: Case study as a methodological approach. *The Qualitative Report, 19,* 1-13. Retrieved

from http://www.nsuworks.nova.edu

Moshabela, M., Sips, I., & Barten, F. (2015). Needs assessment for home-based care and the strengthening of social support networks: The role of community care workers in rural South Africa. *Global Health Action, 8*(1)*,* 1-10. doi:10.3402/gha.v8.29265

Moura, R., Beer, M., Patelli, E., Lewis, J., & Knoll, F. (2016). Learning from major accidents to improve system design. *Safety Science, 84,* 37-45. Retrieved from http://www.core.ac.uk

Moussu, C., & Ohana, S. (2016). Do leveraged firms underinvest in corporate social responsibility? Evidence from health and safety programs in US firms. *Journal of Business Ethics, 135,* 715-729. doi:10.1007/s10551-014-2493-0

Münsterberg, H. (1913). *Psychology and industrial efficiency*. Boston, MA: Houghton Mifflin Company.

Namian, M., Albert, A., Zuluaga, C. M., & Jaselskis, E. J. (2016). Improving hazard-recognition performance and safety training outcomes: Integrating strategies for training transfer. *Journal of Construction Engineering and Management, 142,* 1-11. doi:10.1061/(ASCE)CO.1943-7862.0001160

National Institute for Occupational Safety and Health (NIOSH) (2018). *Publications & Products, 2018*. Retrieved from http://www.cdc.gov

National Safety Council. (2018). *Workplace injuries report, 2018*. Retrieved from http://www.nsc.org

Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and

group levels. *Journal of Applied Psychology, 91,* 946-953. doi:10.1037/0021-9010.91.4.946

Neale, J. (2016). Iterative categorization (IC): A systematic technique for analysing qualitative data. *Addiction, 111,* 1096-1106. doi:10.1111/add.13314

Neale, P., Thapa, S., & Boyce, C. (2006). *Preparing a case study: A guide for designing and conducting a case study for evaluation input*. Watertown, MA: Pathfinder International.

Nelson, A. C., & Cohn, S. (2015). Data collection methods for evaluating museum programs and exhibitions. *Journal of Museum Education, 40*(1)*,* 27-36. doi:10.1080/10598650.2015.11510830

Nenonen, S., Kivistö-Rahnasto, J., & Vasara, J. (2015). Safety considerations during different stages of a project life cycle in the manufacturing industry. *Human Factors and Ergonomics in Manufacturing & Service Industries, 25*(1)*,* 12-27. doi:10.1002/hfm.20531

Nichols, V. (2018). *The impact of performance anxiety on student nurses in simulation settings.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 10977037)

Nkansah, L. A., & Chimbwanda, V. (2016). Interdisciplinary approach to legal scholarship: A blend from the qualitative paradigm. *Asian Journal of Legal Education, 3*(1)*,* 55-71. doi:10.1177/2322005815607135

Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence-Based Nursing, 18,* 34-35. doi:10.1136/eb-2015-102054

Nordlöf, H., Wiitavaara, B., Winblad, U., Wijk, K., & Westerling, R. (2015). Safety culture and reasons for risk-taking at a large steel-manufacturing company: Investigating the worker perspective. *Safety Science, 73,* 126-135. doi:10.1016/j.ssci.2014.11.020

Nunu, W. N., Kativhu, T., & Moyo, P. (2018). An evaluation of the effectiveness of the behaviour based safety initiative card system at a cement manufacturing company in Zimbabwe. *Safety and Health at Work, 9,* 308-313. doi:10.1016/j.shaw.2017.09.002

Oah, S., Na, R., & Moon, K. (2018). The influence of safety climate, safety leadership, workload, and accident experiences on risk perception: A study of Korean manufacturing workers. *Safety and Health at Work, 9,* 427-433. doi:10.1016/j.shaw.2018.01.008

Ocampo, L., & Clark, E. (2015). A sustainable manufacturing strategy decision framework in the context of multi-criteria decision-making. *Jordan Journal of Mechanical & Industrial Engineering, 9*(3)*,* 177-186. Retrieved from http://www.researchgate.net

Okun, A. H., Guerin, R. J., & Schulte, P. A. (2016). Foundational workplace safety and health competencies for the emerging workforce. *Journal of Safety Research, 59,* 43-51. doi:10.1016/j.jsr.2016.09.004

O'Neill, P., Sohal, A., & Teng, C. W. (2016). Quality management approaches and their impact on firms′ financial performance–an Australian study. *International Journal of Production Economics, 171,* 381-393. doi:10.1016/j.ijpe.2015.07.015

Onen, D. (2016). Appropriate conceptualisation: The foundation of any solid quantitative research. *Electronic Journal of Business Research Methods, 14*(1)*,* 28-38. Retrieved from http://www.ejbrm.com

Orogbu, L. O., Onyeizugbe, C. U., & Chukwuma, E. (2018). Safety practice and employee productivity in selected mining firms in Ebonyi State, Nigeria. *Journal of Research in Business, Economics and Management, 10*(3)*,* 1964-1970. Retrieved from http://www.scitecresearch.com

Ose, S. O. (2016). Using Excel and Word to structure qualitative data. *Journal of Applied Social Science, 10,* 147-162. doi:10.1177/1936724416664948

Osibanjo, A. O., Gberevbie, D. E., Adeniji, A. A., & Oludayo, A. O. (2015). Relationship modeling between work environment, employee productivity, and supervision in the Nigerian public sector. *American Journal of Management, 15*(2)*,* 9-23. Retrieved from http://t.www.na-businesspress.com

Overgaard, S. (2015). How to do things with brackets: The epoche explained. *Continental Philosophy Review, 43,* 179-195. doi:10.1007/s11007-015-9322-8

Padilla-Diaz, M. (2015). Phenomenology in educational qualitative research: Philosophy as science or philosophical science*? International Journal of Educational Excellence, 1*(2)*,* 101-110. Retrieved from www.suagm.edu/umet/ijee/pdf/1_2/padilla_diaz_ijee_1_2_101-110.pdf

Palali, A., & van Ours, J. C. (2017). Workplace accidents and workplace safety: On under-reporting and Generation Y jobs. *Labor, 31*(1)*,* 1–14. doi:10.1111/labr.12088

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research, 42,* 533-544. doi:10.1007/s10488-013-0528-y

Pandey, S., & Chawla, D. (2016). Using qualitative research for establishing content validity of e-lifestyle and website quality constructs. *Qualitative Market Research, 19,* 339-356. doi:10.1108/QMR-05-2015-0033

Paradis, E., O'Brien, B., Nimmon, L., Bandiera, G., & Martimianakis, M. A. (2016). Design: Selection of data collection methods. *Journal of Graduate Medical Education, 8,* 263-264. doi:10.4300/jgme-d-16-00098.1

Passmore, J., Krauesslar, V., & Avery, R. (2015). Safety coaching: A literature review of coaching in high hazard industries. *Industrial and Commercial Training, 47,* 195-200. doi:10.1108/ICT-12-2014-0080

Pekovic, S. (2015). Quality and environmental management practices: Their linkages with safety performance. *Production Planning & Control, 26,* 895-909. doi:10.1080/09537287.2014.996623

Percy, W. H., Kostere, K., & Kostere, S. (2015). Generic qualitative research in psychology. *The Qualitative Report, 20*(2)*,* 76-85. Retrieved from http://www.nsiworks.nova.edu

Perez, E. F. (2016). Personality types and level of organizational stress of women managers in big four accounting firms in Vietnam. *International Journal of Business and Information, 11*(1)*,* 92-110. Retrieved from

http://www.ijbi.org

Peterson, D. (1982). *Human error-reduction and safety management*. New York, NY: STPM Press

Petrova, E., Dewing, J., & Camilleri, M. (2016). Confidentiality in participatory research: Challenges from one study. *Nursing Ethics, 23,* 442-454. doi:10.1177/0969733014564909

Phillips, W. J., Fletcher, J. M., Marks, A. G., & Hine, D. W. (2016). Thinking styles and decision making: A meta-analysis. *Psychological Bulletin, 142,* 260-290. doi:10.1037/bul0000027

Pilbeam, C., Doherty, N., Davidson, R., & Denyer, D. (2016). Safety leadership practices for organizational safety compliance: Developing a research agenda from a review of the literature. *Safety Science, 86,* 110-121. doi:10.1016/j.ssci.2016.02.015

Pillay, M. (2015). Accident causation, prevention, and safety management: A review of the state-of-the-art. *Procedia Manufacturing, 3,* 1838-1845. doi:10.1016/j.promfg.2015.07.224

Pocock, N. (2015). Emotional entanglements in tourism research. *Annals of Tourism Research, 53,* 31-45. doi:10.1016/j.annals.2015.04.005

Pordanjani, T. R., & Ebrahimi, M. (2015). Safety motivation and work pressure as predictors of occupational accidents in the petrochemical industry. *Health Scope, 4,* 20-24. doi:10.17795/jhealthscope-26492

Porteous, A. H., Rammohan, S. V., & Lee, H. L. (2015). Carrots or sticks? Improving

social and environmental compliance at suppliers through incentives and penalties. *Production & Operations Management, 24,* 1402-1413. doi:10.1111/poms.12376

Powell, T. C. (1995). Total quality management as competitive advantage: A review and empirical study. *Strategic Management Journal, 16*(1)*,* 15-37. Retrieved from http://www.thomaspowell.co.uk

Probst, T. M. (2015). Organizational safety climate and supervisor safety enforcement: Multilevel explorations of the causes of accident underreporting. *Journal of Applied Psychology, 100,* 1899-1907. doi:10.1037/a0039195

Proctor, R. W., & Chen, J. (2015). The role of human factors/ergonomics in the science of security: Decision making and action selection in cyberspace. *Human Factors, 57,* 721-727. doi:10.1177/0018720815585906

Protecting Human Research Participants. (2019). *NIH Office of Extramural Research.* Retrieved from http://www.phrp.nihtraining.com

Quinney, L., Dwyer, T., & Chapman, Y. (2016). Who, where, and how of interviewing peers: Implications for a phenomenological study. *Sage Open Journal, 6,* 1-10. doi:10.1177/21582440116659688

Radcliffe, L. (2013). Qualitative diaries: Uncovering the complexities of work-life decision-making. *Qualitative Research in Organizations and Management, 8,* 163-180. doi:10.1108/QROM-04-2012-1058

Rafii, M., & Andri, S. (2015). The influence of employee recruitment and placement on employee performance on PT. Bank Riaukepri Pekanbaru. *Online Journal of*

*Indonesia Faculty of Social and Political Sciences, 2*(1)*,* 1-12. Retrieved from http://www.icspi.ui.ac.id

Rajendran, R., Hodgkinson, D., & Rayman, G. (2015). Patients with diabetes requiring emergency department care for hypoglycaemia: Characteristics and long-term outcomes determined from multiple data sources. *Postgraduate Medical Journal, 91,* 65-71. doi:10.1136/postgradmedj-2014-132926

Ramesh, C., Manickam, C., & Prasanna, S. C. (2016). Lean Six Sigma approach to improve overall equipment effectiveness performance: A case study in the Indian small manufacturing firm. *Asian Journal of Research in Social Sciences and Humanities, 6,* 1063-1072. doi:10.5958/2249-7315.2016.01349.6

Ramesh, N., & Ravi, A. (2013). TQM tools and techniques in promoting team working culture in the manufacturing organisations. *International Journal of Productivity and Quality Management, 12*(4)*,* 466-479. Retrieved from http://www.researchgate.net

Ramlo, S. (2016). Mixed method lessons learned from 80 years of Q methodology. *Journal of Mixed Methods Research, 10*(1)*,* 28-45. doi:10.1177/1558689815610998

Rappin, C. L., Wuellner, S. E., & Bonauto, D. K. (2016). Employer reasons for failing to report eligible workers' compensation claims in the BLS survey of occupational injuries and illnesses. *American Journal of Industrial Medicine, 59,* 343-356. doi:10.1002/ajim.22582

Rathi, N., & Lee, K. (2015). Retaining talent by enhancing organizational prestige: An

hrm strategy for employees working in the retail sector. *Personnel Review, 44,* 454-469. doi:10.1108/PR-05-2013-0070

Reader, T., Mearns, K., Lopes, C., & Kuha, J. (2016). Organizational support for the workforce and employee safety citizenship behaviors: A social exchange relationship. *Human Relations, 70*(3)*,* 362-385. Retrieved from http://www.eprints.lse.ac.uk

Reason, J. (2016). *Managing the risks of organizational accidents*. doi:10.4324/9781315543543

Rebelo, M. F., Santos, G., & Silva, R. (2016). Integration of management systems: Towards a sustained success and development of organizations. *Journal of Cleaner Production, 127,* 96-111. doi:10.1016/j.jclepro.2016.04.011

Reichelt, M., & Haas, A. (2015). *Commuting farther and earning more? How employment density moderates workers' commuting distance* (No. 33/2015). IAB-Discussion Paper. Retrieved from http://www.hdl.handle.net

Rezvani, A., Chang, A., Wiewiora, A., Ashkanasy, N. M., Jordan, P. J., & Zolin, R. (2016). Manager emotional intelligence and project success: The mediating role of job satisfaction and trust. *International Journal of Project Management, 34,* 1112-1122. doi:10.1016/j.ijproman.2016.05.012

Robinson, O. C. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology, 11*(1)*,* 25-41. doi:10.1080/14780887.2013.801543

Rohani, J. M., & Zahraee, S. M. (2015). Production line analysis via value stream

mapping: A lean manufacturing process of color industry. *Procedia Manufacturing, 2,* 6-10. doi:10.1016/j.promfg.2015.07.002

Rosenthal, M. (2016). Qualitative research methods: Why, when, and how to conduct interviews and focus groups in pharmacy research. *Currents in Pharmacy Teaching and Learning, 8,* 509-516. doi:10.1016/j.cptl.2016.03.021

Roy, K., Zvonkovic, A., Goldberg, A., Sharp, E., & LaRossa, R. (2015). Sampling richness and qualitative integrity: Challenges for research with families. *Journal of Marriage and Family, 77*(1)*,* 243-260. doi:10.1111/jomf.12147

Rybicka, J., Tiwari, A., Del Campo, P. A., & Howarth, J. (2015). Capturing composites manufacturing waste flows through process mapping. *Journal of Cleaner Production, 91,* 251-261. doi:10.1016/j.jclepro.2014.12.033

Sabran, A. S. H. (2016). Knowledge management in human error in accident prevention. *Proceedings of the 2016 International Conference on Industrial Engineering and Operations Management.* Kuala Lumpur, Malaysia: Society International.

Saifullah, N., Alam, M., Zafar, M., & Humayon, A. (2015). Job satisfaction: A contest between human and human and organizational behavior. *International Journal of Economic Research, 6*(1)*,* 45-51. Retrieved from http://www.ijeronline.com

Salmon, P. M., Stanton, N. A., Lenné, M., Jenkins, D. P., Rafferty, L., & Walker, G. H. (2017). Accidents, accident causation models and accident analysis methods. In *Human Factors Methods and Accident Analysis* (1st ed.). (pp. 23-28). Boca Raton, FL: Taylor & Francis Group, LLC.

Sarma, S. K. (2015). Qualitative research: Examining the misconceptions. *South Asian*

*Journal of Management, 22*(3)*,* 176-191. Retrieved from http://www.sajm-amdisa.org

Schorn, T. J. (2017). Assessing the root cause of foundry injuries. *American Foundry Society, 17,* 1-7. Retrieved from http://www.mcls.gov.ir

Schulte, P. A., Guerin, R. J., Schill, A. L., Bhattacharya, A., Cunningham, T. R., Pandalai, S. P., ... & Stephenson, C. M. (2015). Considerations for incorporating "well-being" in public policy for workers and workplaces. *American Journal of Public Health, 105,* 31-44. doi:10.2105/AJPH.2015.302616

Seabury, S. A., Terp, S., & Boden, L. I. (2017). Racial and ethnic differences in the frequency of workplace injuries and prevalence of work-related disability. *Health Affairs, 36,* 266-273. doi:10.1377/hlthaff.2016.1185

Searcy, C., Dixon, S. M., & Neumann, W. P. (2016). The use of work environment performance indicators in corporate social responsibility reporting. *Journal of Cleaner Production, 112,* 2907-2921. doi:10.1016/j.jclepro.2015.10.081

Sekar, B., & Siddiqui, N. A. (2015). A study on behavior-based safety in refinery. *International Journal on Occupational Health & Safety, Fire & Environment, 6*(1)*,* 7-13. Retrieved from http://www.ohsfejournal.com

Seo, H. C., Lee, Y. S., Kim, J. J., & Jee, N. Y. (2015). Analyzing safety behaviors of temporary construction workers using structural equation modeling. *Safety Science, 77,* 160-168. doi:10.1016/j.ssci.2015.03.010

Shappell, S., Detwiler, C., Holcomb, K., Hackworth, C., Boquet, A., & Wiegmann, D. A. (2007). In Human error and commercial aviation accidents: An analysis using the

human factors analysis and classification system. *The Journal of the Human Factors and Ergonomics Society,49,* 227-242. doi:10.1518/001872007X312469

Sharma, A. K., & Sharma, S. (2015). The influence of human resource practices on productivity in developing countries- review of innovative HR practices. *International Journal of Multidisciplinary Approach & Studies*, *2*(3), 116-120. Retrieved from http://www.ijmas.com

Sharma, R., Gupta, P., & Saini, V. (2018). Six Sigma DMAIC methodology implementation in automobile industry: A case study. *Journal of Manufacturing Engineering, 13*(1)*,* 42-50. Retrieved from http://www.smenec.org

Sheehan, C., Donohue, R., Shea, T., Cooper, B., & De Cieri, H. (2016). Leading and lagging indicators of occupational health and safety: The moderating role of safety leadership. *Accident Analysis & Prevention, 92,* 130-138. doi:10.1016/j.aap.2016.03.018

Shendell, D. G., Milich, L. J., Apostolico, A. A., Patti, A. A., & Kelly, S. (2017). Comparing online and in-person delivery formats of the OSHA 10-hour general industry health and safety training for young workers. *New Solutions: A Journal of Environmental and Occupational Health Policy, 27*(1)*,* 92-106. doi:10.1177/1048291117697109

Shin, D. P., Gwak, H. S., & Lee, D. E. (2015). Modeling the predictors of safety behavior in construction workers. *International Journal of Occupational Safety and Ergonomics, 21,* 298-311. doi:10.1080/10803548.2015.1085164

Shuen, Y. S., & Wahab, S. R. A. (2016). The relationship between safety communication

and human factor accident at the workplace-a conceptual framework. *Jurnal Kemanusiaan, 14*(3)*,* 1-17. Retrieved from http://www.jurnalkemanusiaan.utm

Sim, J., Saunders, B., Waterfield, J., & Kingstone, T. (2018, March). Can sample size in qualitative research be determined a priori? *International Journal of Social Research Methodology, 21,* 619-634. doi:10.1080/13645579.2018.1454643

Simpson, A., & Quigley, C. F. (2016). Member checking process with adolescent students: Not just reading a transcript. *The Qualitative Report, 21*(2)*,* 376-392. Retrieved from http://www.nsuworks.nova.edu

Sin, A. B., Zailani, S., Iranmanesh, M., & Ramayah, T. (2015). Structural equation modelling on knowledge creation in Six Sigma DMAIC project and its impact on organizational performance. *International Journal of Production Economics, 168,* 105-117. doi:10.1016/j.ijpe.2015.06.007

Sinelnikov, S., Inouye, J., & Kerper, S. (2015). Using leading indicators to measure occupational health and safety performance. *Safety Science, 72,* 240-248. doi:10.1016/j.ssci.2014.09.010

Singh, M., James, P. S., & Ganguli, S. (2018). Managing employees with chronic illness. *Human Resource Management International Digest, 26*(1)*,* 7-10. doi:10.1108/HRMID-06-2017-0101

Srinivasan, S., Ikuma, L. H., Shakouri, M., Nahmens, I., & Harvey, C. (2016). 5S impact on safety climate of manufacturing workers. *Journal of Manufacturing Technology Management, 27,* 364-378. doi:10.1108/JMTM-07-2015-0053

Storer, H. L., Casey, E. A., & Herrenkohl, T. I. (2017). Developing “whole school”

bystander interventions: The role of school-settings in influencing adolescents responses to dating violence and bullying. *Children and Youth Services Review, 74,* 87-95. doi:10.1016/j.childyouth.2017.01.018

Stubbé, H. E., Van Emmerik, M. L., & Kerstholt, J. H. (2017). Helping behavior in a virtual crisis situation: Effects of safety awareness and crisis communication. *Journal of Risk Research, 20,* 433-444. doi:10.1080/13669877.2015.1071865

Stuckey, H. L. (2015). The second step in data analysis: Coding qualitative research data. *Journal of Social Health and Diabetes, 3*(1)*,* 7-10. doi:10.4103/2321-0656.140875

Subramaniam, C., Mohd Shamsudin, F., Mohd Zin, M. L., Sri Ramalu, S., & Hassan, Z. (2016). Safety management practices and safety compliance in small medium enterprises: Mediating role of safety participation. *Asia-Pacific Journal of Business Administration, 8,* 226-244. doi:10.1108/APJBA-02-2016-0029

Swuste, P., Theunissen, J., Schmitz, P., Reniers, G., & Blokland, P. (2016). Process safety indicators, a review of literature. *Journal of Loss Prevention in the Process Industries, 40,* 162-173. doi:10.1016/J.JLP.2015.12.020

Takala, J., Hamalainen, P., Nenonen, N., Takahashi, K., Chimed-ochir, O., & Rantanen, J. (2017). Comparative analysis of the burden of injury and illness at work in selected countries and regions. *Central European Journal of Occupational and Environmental Medicine, 23,* 6-31. Retrieved from http://www.icohweb.org

Tappura, S., Sievänen, M., Heikkilä, J., Jussila, A., & Nenonen, N. (2015). A management accounting perspective on safety. *Safety Science, 71,* 151-159.

doi:10.1016/j.ssci.2014.01.011

Taufek, F. H. B. M., Zulkifle, Z. B., & Kadir, S. Z. B. A. (2016). Safety and health practices and injury management in manufacturing industry. *Procedia Economics and Finance, 35,* 705-712. doi:10.1016/S2212-5671(16)00088-5

Taylor, E. (2015). Safety benefits of mandatory OSHA 10 h training. *Safety Science, 77,* 66-71. doi:10.1016/j.ssci.2015.03.003

Thai, V., & Jie, F. (2018). The impact of Total Quality Management and supply chain integration on firm performance of container shipping companies in Singapore. *Asia Pacific Journal of Marketing and Logistics, 30,* 605-626. doi:10.1108/APJML-09-2017-0202

Thistoll, T., Hooper, V., & Pauleen, D. J. (2016). Acquiring and developing theoretical sensitivity through undertaking a grounded preliminary literature review. *Quality & Quantity, 50,* 619-636. doi:10.1007/s11135-015-0167-3

Thomas, D. R. (2017). Feedback from research participants: Are member checks useful in qualitative research? *Qualitative Research in Psychology, 14*(1)*,* 23-41. doi:10.1080/14780887.2016.1219435

Thompson, C. A. (2016). New OSHA document reviews hazardous-drug safety for employees. *American Journal of Health-System Pharmacy: AJHP: Official Journal of the American Society of Health-System Pharmacists, 73,* 1204-1205. doi:10.2146/news160050

Thompson, N. (2015). *People skills*. New York, NY: Palgrave

Tonetto, L. M., & Desmet, P. M. (2016). Why we love or hate cars: A qualitative

approach to the development of a quantitative user experience survey. *Applied Ergonomics, 56,* 68-74. doi:10.1016/j.apergo.2016.03.008

Toole, T. M., Gambatese, J. A., & Abowitz, D. A. (2016). Owners' role in facilitating prevention through design. *Journal of Professional Issues in Engineering Education and Practice, 143*(1)*,*1-30. Retrieved from http://www.researchgate.com

Toppazzini, M. A., & Wiener, K. K. (2017). Making workplaces safer: The influence of organisational climate and individual differences on safety behaviour. *Heliyon, 3,* 1-16. doi:10.1016/j.heliyon.2017.e00334

Tran, V. T., Porcher, R., Tran, V. C., & Ravaud, P. (2017). Predicting data saturation in qualitative surveys with mathematical models from ecological research. *Journal of Clinical Epidemiology, 82,* 71-78. doi:10.1016/j.jclinepi.2016.10.001

Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the Longwall method of coal-getting: An examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system. *Human Relations, 4*(1)*,* 3-38. doi:10.1177/001872675100400101

Trotter, R. T., II. (2012). Qualitative research sample design and sample size: Resolving and unresolved issues and inferential imperatives. *Preventive Medicine, 55,* 398-400. doi:10.1016/j.ypmed.2012.07.003

Tsai, C. Y., Horng, J. S., Liu, C. H., & Hu, D. C. (2015). Work environment and atmosphere: The role of organizational support in the creativity performance of

tourism and hospitality organizations. *International Journal of Hospitality Management, 46,* 26-35. doi:10.1016/j.ijhm.2015.01.009

Tuapawa, K. (2017). Interpreting experiences of students using educational online technologies to interact with teachers in blended tertiary environments: A phenomenological study. *Australasian Journal of Educational Technology, 33*(1)*,* 163-175. doi:10.14742/ajet.2964

Tyagi, S., Choudhary, A., Cai, X., & Yang, K. (2015). Value stream mapping to reduce the lead-time of a product development process. *International Journal of Production Economics, 160,* 202-212. doi:10.1016/j.ijpe.2014.11.002

Unnikrishnan, S., Iqbal, R., Singh, A., & Nimkar, I. M. (2015). Safety management practices in small and medium enterprises in India. *Safety and Health at Work, 6*(1)*,* 46-55. doi:10.1016/j.shaw.2014.10.006

U.S. Bureau of Labor Statistics (2018). *Injuries, illnesses, and fatalities: Nonfatal injuries and illnesses, private industry, Occupational injuries and illnesses industry data, 2014 forward*. Retrieved from http://www.data.bls.gov/timeseries/ISU00000000061100

U.S. Department of Health & Human Services. (2016). *The Belmont Report: Ethical principles and guidelines for the protection of human subjects of research.* Retrieved from http://www.hhs.gov

Vaismoradi, M., Jones, J., Turunen, H., & Snelgrove, S. (2016). Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice, 6*(5)*,* 100-110. Retrieved from http://www.jnep.sciedupress.com

Valmohammadi, C., & Roshanzamir, S. (2015). The guidelines of improvement: Relations among organizational culture, TQM and performance. *International Journal of Production Economics, 164,* 167-178. doi:10.1016/j.ijpe.2014.12.028

Van Hoeven, L. R., Janssen, M. P., Roes, K. C., & Koffijberg, H. (2015). Aiming for a representative sample: Simulating random versus purposive strategies for hospital selection. *BMC Medical Research Methodology, 15*(1)*,* 90-98. doi:10.1186/s12874-015-0089-8

Van Rensburg, A. J., & Ukpere, W. I. (2014). Application of grounded theory in career research reviewed. *Mediterranean Journal of Social Sciences, 5,* 543-556. doi:10.5901/mjss.2014.v5n4p543

VanScoy, A., & Evenstad, S. B. (2015). Interpretative phenomenological analysis for LIS research. *Journal of Documentation, 71,* 338-357. doi:10.1108/JD-09-2013-0118

Von Thiele Schwarz, U., Hasson, H., & Tafvelin, S. (2016). Leadership training as an occupational health intervention: Improved safety and sustained productivity. *Safety Science, 81,* 35-45. doi:10.1016/j.ssci.2015.07.020

Wachter, J. K., & Yorio, P. L. (2014). A system of safety management practices and worker engagement for reducing and preventing accidents: An empirical and theoretical investigation. *Accident Analysis & Prevention, 68,* 117-130. doi:10.1016/j.aap.2013.07.029

Wang, Y., & Griffis, F. (2018). The theory of zero incident safety management. *Journal of Civil, Construction and Environmental Engineering, 3,* 83-98. doi:10.11648/j.jccee.20180303.15

Webb, M., & Morancie, A. (2015). Food safety knowledge of foodservice workers at a university campus by education level, experience, and food safety training. *Food Control, 50,* 259-264. doi:10.1016/j.foodcont.2014.09.002

Wei, J., Zhou, L., Wang, F., & Wu, D. (2015). Work safety evaluation in mainland China using grey theory. *Applied Mathematical Modelling, 39,* 924-933. doi:10.1016/j.apm.2014.06.017

White, G. R., & Cicmil, S. (2016). Knowledge acquisition through process mapping: Factors affecting the performance of work-based activity. *International Journal of Productivity and Performance Management, 65,* 302-323. doi:10.1108/IJPPM-01-2014-0007

Wiengarten, F., & Longoni, A. (2018). How does uncertainty affect workplace accidents? Exploring the role of information sharing in manufacturing networks. *International Journal of Operations & Production Management, 38*(1)*,* 295-310. doi:10.1108/IJOPM-07-2015-0431

Williams, J. H. (2005, June). Using behavioral safety to improve safety culture. *ASSE Professional Development Conference and Exposition*. New Orleans, Louisiana: American Society of Safety Engineers.

Wilson, H., Dashiell-Aje, E., Anatchkova, M., Coyne, K., Hareendran, A., Leidy, N. K., & Wyrwich, K. (2018). Beyond study participants: A framework for engaging patients in the selection or development of clinical outcome assessments for evaluating the benefits of treatment in medical product development. *Quality of Life Research, 27*(1)*,* 5-16. doi:10.1007/s11136-017-1577-6

Wiser, M. C. (2018). Opportunities to interpret: A methodological discussion of insider research, perceptions of the researcher, and knowledge production. *Sport in Society, 21,* 215-225. doi:10.1080/17430437.2016.1221927

Wohl, A. R., Ludwig-Barron, N., Dierst-Davies, R., Kulkarni, S., Bendetson, J., Jordan, W., & Pérez, M. J. (2017). Project engage: Snowball sampling and direct recruitment to identify and link hard-to-reach-in HIV infected persons who are out of care. *JAIDS Journal of Acquired Immune Deficiency Syndromes, 75,* 190-197. doi:10.1097/QAI.0000000000001312

Wohlin, C., & Aurum, A. (2015). Towards a decision-making structure for selecting a research design in empirical software engineering. *Empirical Software Engineering, 20,* 1427-1455. doi:10.1007/s10664-014-9319-7

Wold, T., & Laumann, K. (2015). Safety management systems as communication in an oil and gas producing company. *Safety Science, 72,* 23-30. doi:10.1016/j.ssci.2014.08.004

Woods, D. T., McMurtrey, M. E., & Griffin, K. (2016). Six Sigma vs. performance solutions by Milliken. *Journal of Strategic Innovation and Sustainability, 11,* 81-86. Retrieved from http://www.na-businesspress.com

Woods, M., Paulus, T., Atkins, D. P., & Macklin, R. (2016). Advancing qualitative research using qualitative data analysis software (QDAS)? Reviewing potential versus practice in published studies using ATLAS.ti and NVivo, 1994–2013. *Social Science Computer Review, 34,* 597-617. doi:10.1177/0894439315596311

Wu, C., Song, X., Wang, T., & Fang, D. (2015). Core dimensions of the construction

safety climate for a standardized safety-climate measurement. *Journal of Construction Engineering and Management, 141,*1-12. doi:10.1061/ (ASCE)CO.1943-7862.0000996

Xu, J. D., Cenfetelli, R. T., & Aquino, K. (2016). Do different kinds of trust matter? An examination of the three trusting beliefs on satisfaction and purchase behavior in the buyer–seller context. *The Journal of Strategic Information Systems, 25*(1)*,* 15-31. doi:10.1016/j.jsis.2015.10.004

Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *The Qualitative Report, 20*(2)*,* 134-152. Retrieved from http://www.nsuworks.nova.edu

Ye, Q., Wang, D., & Li, X. (2018). Promoting employees' learning from errors by inclusive leadership: Do positive mood and gender matter? *Baltic Journal of Management, 13*(1)*,* 125-142. doi:10.1108/BJM-05-2017-0160

Yin, R. K. (2018). *Case study research: Design and methods*. (6th ed.). Thousand Oaks, CA: Sage Publications Inc.

Yuan, X., & Wang, K. (2012). Study on safety management of small and medium-sized enterprises based on BBS. *Procedia Engineering, 45,* 208-213. doi:10.1016/j.proeng.2012.08.145

Yüksel, P., & Yildirim, S. (2015). Theoretical frameworks, methods, and procedures for conducting phenomenological studies in educational settings. *Turkish Online Journal of Qualitative Inquiry, 6*(1)*,* 1-20. doi:10.17569/tojqi.59813

Zhang, S., Boukamp, F., & Teizer, J. (2015). Ontology-based semantic modeling of

construction safety knowledge: Towards automated safety planning for job hazard analysis (JHA). *Automation in Construction, 52,* 29-41. doi:10.1016/j.autcon.2015.02.005

Zhang, Y., & Wildemuth, B. M. (2016). Qualitative analysis of content. *Applications of social research methods to questions in information and library science*. Santa Barbara, CA: Libraries Unlimited.

Zhou, J. L., & Lei, Y. (2017). Paths between latent and active errors: Analysis of 407 railway accidents/incidents' causes in China. *Safety Science,110,* 47-58. doi:10.1016/j.ssci.2017.12.027

Zhou, Q., Fang, D., & Wang, X. (2008). A method to identify strategies for the improvement of human safety behavior by considering safety climate and personal experience. *Safety Science, 46,* 1406-1419. doi:10.1016/j.ssci.2007.10.005

Appendix A: Interview Protocol

| **Interview Protocol** | |
|---|---|
| **WHAT TO DO** | **WHAT TO SAY - SCRIPT** |
| 1. Introduction of the interview | I would like to take time out to thank you for allowing me to interview you today. This interview and data collected is for an assignment called a doctoral study, which is a graduation requirement. I would like you to know that your participation in this education assignment is to try to find strategies to improve voluntary employee turnover, which will help businesses to increase profitability. I will interview you and no less than 4 other managers to gather information to find solutions to reduce workplace accidents.<br>First, I would like to begin by letting you know that your participation is voluntary. If there is any question that I ask, that you do not feel comfortable with you do not have to answer it or if you want to stop the interview at any time feel free to do so. Also, as I told you before I am going to audiotape this interview and I am going to take notes as well, is that OK with you?<br>When your interview is complete, within 72 hours I am going to email you a one or two page summary of my interpretations. If I misrepresented you in any way and if there is any information that you would like to add or take away just let me know. To ensure confidentiality, I plan to protect your identity, the name of your organization, and all data collected. I have set aside one hour for the interview and extended up to 30 minutes, if necessary. |

| | |
|---|---|
| 2. Watch for non-verbal queues<br><br>3. Paraphrase as needed<br><br>4. Ask follow-up probing questions to get more in-depth information | The overarching research question used for this qualitative case study is the following: What workplace safety strategies do managers use to reduce workplace accidents? |
| | **Interview Questions**<br>1. What strategies do you use to increase workplace safety?<br>2. How have you measured the effectiveness of your strategies to reduce workplace accidents?<br>3. What were the key barriers to implementing your workplace safety strategies?<br>4. How did you address the key challenges to implement your strategies to reduce workplace accidents?<br>5. What other information would you like to share regarding the strategies you have used to increase workplace safety? |
| 5. Bring the interview to a close by thanking the participant | Again, I want to thank you for taking the time to allow me to interview you. This concludes the interview. |

| | |
|---|---|
| 6. Schedule member checking appointment | I want to reiterate that I will email you a copy of my notes so that you can review them to ensure that I did not misrepresent you in any way. Also, to see if there is anything that you would like to add you can do so at that time. What would be a good time for you to meet for a follow up member checking interview next week? Looking forward to seeing you then. |
| **Follow-Up Member Checking Interview** | |
| 7. Introduction of the follow-up interview | I would like to take time out to thank you for your participation in this study and sharing your insight and documents related to reducing workplace accidents. Were you able to review my notes from the interview? |
| 8. Share a copy of the brief synthesis for each individual question | I have recorded the following evidence from your interview session and have summarized my understanding as per my transcription and I wish to verify with you any gaps, missing sections, or hard to understand responses. Reviewing of the summary of the interview responses to ensure accuracy will take approximately 30-45 minutes. |
| | |

| | |
|---|---|
| 9. At the close of each interview, I will thank each participant for taking the time out to participate in the study and give them a $10 Visa gift card | **Interview Questions**<br>1. What strategies do you use to increase workplace safety?<br>2. How have you measured the effectiveness of your strategies to reduce workplace accidents?<br>3. What were the key barriers to implementing your workplace safety strategies?<br>4. How did you address the key challenges to implement your strategies to reduce workplace accidents?<br>5. What other information would you like to share regarding the strategies you have used to increase workplace safety? |
| | |

# Appendix B: Invitation to Participate

<Date>

<Address Block>

Dear Sir/Madam,

As part of my doctoral study research at Walden University, I would like to invite you to participate in a research study I am conducting to explore strategies some organizational managers use to reduce workplace accidents. Your participation in the research study is voluntary and will be confidential. Please ask any questions you may have before accepting the invitation to participate. To achieve the objectives of the research study, your participation depends on satisfying certain criteria. Participants in this study included the following eligibility criteria (a) having been a manager for 12 months or longer in an industry, (b) having been a full-time employee with the organization, (c) having developed strategies to reduce workplace accidents, and (d) working at a company located in the central region of North Carolina.

If you satisfy these criteria and agree to participate in the study, please notify me via the contact information. I will contact you again to set up the interview. I will provide a copy of the consent form for your signing at the interview. The initial interview will be completed within one hour from start time and extended up to 30 minutes, if necessary. The follow-up interview will between 30-45 minutes. The interviews will be audio-recorded and participants will have the opportunity to review the summaries for accuracy before the inclusion of the study. I appreciate your valuable time.

Sincerely, Bryan Vaiagae

# Appendix C: Letter of Cooperation

**Date: 2 July 2019**

**Managers Name:** [redacted]

**Company Name:** [redacted]

**Company Address:** [redacted]

**Dear Bryan Vaiagae,**

Based on a review of your invitation to participate, I give permission for you to conduct the study entitled **Workplace Safety Strategies Used by Managers to Reduce Workplace Accidents** within [redacted] located in [redacted]. As part of this study, I authorize you to conduct recruitment of participants, for face-to-face interviews, collect archival data, which includes company policies and practices in workplace safety, verify the transcribed interview with the participant, and disseminate a summary of the final research results to the participants of the study. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include providing access to potential participants and access to review any workplace safety policies or practices that our company has implemented. In addition, we reserve the right to withdraw from the study at any time for any reason.

I understand that the study will not name our organization in the doctoral project report that is published in ProQuest.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the individual and organizational identities will remain confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Authorizing Official Signature [redacted]

Printed name: [redacted]

Title: [redacted]

Phone number: [redacted]

Email address: [redacted]