Addis Ababa University

College of Education and Behavioral Studies

School of Psychology

Safety Climate Perception and its contribution for the Prediction of Actual Work Place Injuries among Workers of Kombolcha Textile Factory

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Abstract

Textile industry is characterized by a high existence of many potential hazards that can easily inflict occupational injuries among workers. Recent years have witnessed the link between the concepts of safety climate with variety of safety outcomes including accidents and injuries .Yet, safety climate measures are rarely addressed in Ethiopia. Therefore, the objective of this study was to explore the role of employees' safety climate perception with regard to predicting occurrence occupational injuries. Moreover, the study also examines the difference in safety climate perception based on demographic factors to aid a greater understanding of the many dynamics in predicting injuries among respondents. A cross sectional study design was conducted on 255 employees' from the three production deportments (spinning, weaving and finishing) of kombolcha textile factory. A pre tested safety climate scale which was originally developed by Cox and Cheyne (2000) was employed in order to assess the prevalent safety climate in the factory. This tool has 43 items within nine dimensions. The prevalence rate of injuries in the factory was 294 per 1000 exposed workers per year. Fingers and hands were the most affected body parts. Workers gender, age and length of service duration also appeared as significant predictors of occupational injuries. Findings from this study show, when all the nine dimensions of the safety climate tool were considered as independent variable and injuries as dependent variable, safety climate perception of employees were significant in predicting occupational injuries. The study also showed certain safety climate dimensions were more salient in predicting injuries. Finally the study implies, by using safety climate surveys as a proactive indicator of safety, organizations can modify their safety condition trough intervening to certain aspects of safety climate dimensions that are linked with injuries.

Key words**:** Employees, demographic factors, Safety Climate Perception, dimension of safety climate, injury,

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Acronyms

ARSBOLSA Amhara Regional State Bureau of Labor and Social Affairs

KTF Kombolcha Textile Factory

ILO International Labor Organization

OSH Occupational Safety and Health

SCAT Safety Climate Assessment Tool

SPSS Statistical Package for Social Science

WHO World Health Organization

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CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Workers exposure to various sources of hazards and the actual occurrences of work related injuries are bigger than it is believed earlier. As an estimate made by the World Health Organization (1999) asserted, there are about 350 000 fatal and 264 million cases of non-fatal injuries occurred each year on the general working population worldwide. According to Gyekye (2008) substantial decline in work place accidents and injuries was seen in the developed nations between the periods of 1912-2003. Unfortunately, the reverse is true for workers in the developing nations where occupational injuries are still on the rise. Due to absence of proper recording and notification systems, obtaining reliable and comprehensive information on occupational injuries is difficult in the developing countries. As a report by International Labor Organization (cited on Hamalainen, Takala and Saarela, 2005) figures of occupational fatal and non-fatal accidents in developing countries were greatly underestimated.

Estimate made by the WHO (1999) indicated each year over 120 million nonfatal and 200,000 fatal industrial accidents occur in developing countries. The report also showed, though, 80% of the world's labor force is from this area, only 5–10% of the work force have an access to professional and effective safety management initiatives and programs. In sub Saharan African countries alone, 42 million work related accidents and 54 000 fatal injuries happened annually. The fatality rate of the region is 21 per 100 000 workers and the accident rate per 100 000 workers is 16 000 (WHO, 1999).

The case in Ethiopia is not different from the above fact as indicated by Tadesse and Kumie (2007) nowadays, with the existing rapid expansion of various small and large scale factories and industries within the country, it is resulting in significant occurrence of occupational accidents and injuries. Another report by Seblework (2006) also showed, during the years 1993-2004 a total of 101 fatal and 44,903 non-fatal work place injuries were recorded. According to this report, looking at statistics by industry, in the year 200l-2002 alone, most occupational injuries and accidents were on the manufacturing sector with 86.6%, followed by agriculture and fishing which comprises 7.5% of the total occupational injury.

Previously, a considerable emphasis was given by occupational health related researchers on the engineering approach to improve occupational safety performance of organizations (Antonson, 2009). However, as referred by Yule (2003) in this modern era, especially in the last three decades, there has been an increased interest in trying to understand primarily how certain management practices and other organizational factors impact workplace safety. As indicated by Flin, Mearns, O'Connor, and Bryden (2000) organizations are focusing in using more predictive measures of safety. They also added safety management and injury prevention research are continually suggesting the role of human behavior role in preventing injuries or fatalities.

Safety climate is originated from the psychological approach towards organizational safety and as Yule (2003) indicated more specifically it appears in organizational, social and behavioral psychology literatures in the 1980's. The term safety climate was first coined by Zohar (1980 p. 96) in his empirical investigation of safety attitudes in Israeli manufacturing sector, and he conceptualized it as 'a summary of molar perceptions that employee's share about their work environment'.

Similarly, a more recent definition of safety climate was given by Neal and Griffin (2004) as the perception of workers about the value and importance given to safety in their work environment. Current understanding of work place safety also incorporate the role of management commitment to safety, early assessment of risks and the role of training and safety based proposals as pointed by Cohen and Cleveland (2003). It has been argued that occupational injuries are basically originated from the lesser attitude and focus given towards occupational health and safety by the management body of organizations (Jonson, 1982; Zohar, 1980).

Safety climate, or employees' perceptions of organizational safety policies, procedures, and practices plays a paramount role in keeping workers health and safety at their workplaces (Zohar, 2003). It is also considered as proactive and predictive measure of occupational safety as mentioned by Clarke (1998). It is also suggested by Mearns , et al.,(1998) safety climate as a proactive and leading indicator of safety measures , generate information to organizations to respond to changing circumstances and take necessarily actions that is shown as a gap in variety of safety dimensions. Safety climate based studies tried to demonstrate how employees perceive their managers, supervisors and co-workers in relation to the value they give towards safety issues (Neal & Griffin, 2004).

A study by Zohar (1980) suggested managerial safety attitude can influence employees' safety attitude and actual involvement towards safety related behaviors. Previous studies (Zohar, 1980, 2003; Neal & Griffin, 2004) showed safety climate perception of workers within organizations can significantly predict safety related outcomes, such as accidents or injuries. To put this in another way, work related accidents and injuries could be prevented if counter measures are taken to address areas of safety climate that pointed to specific accident related variables that required primary attention and consideration.

The textile industry is said to be the largest employers of labor and characterized by heavy involvement of several machineries and equipment throughout the world (Zuskin, Mustajbegovic ,Schachter, Budak & Godwic-cvar,1998). Major manufacturing processes of this industry consist of spinning, weaving, processing and finishing, which involves several technological activities some of which are new within the textile industry. According to Zuskin et al. (1998) workers in textile industry encounter various types of hazards on their job setting that lead them to be at high risk of various occupational injuries.

1.2. *Statement of the Problem*

It is obvious that occupational injuries are a source of huge human and economic cost. The burden is not only for the individual worker but also for the organization, community and societal level at large. Work related Injuries have been known in causing various personal sufferings and in diminishing the morale of workers (Mearns, et al., 1998). As suggested bySeo, Torabi, Blair, and Ellis (2004) though, work-related injuries are common in every kind of job in various part of the world; this burden is high especially in developing countries. This is primarily due to the very minimal attention given to occupational health and safety in those countries.

All the factors responsible for work related injuries and safety problems cannot be certainly identified. However, as Yule (2003) pointed employees perception of the importance assigned to safety at their organization (safety climate) have been playing critical role in accident and injury involvement of workers. As indicated by Yule (2003) safety climate is a set of attitudes and behaviors as expressed at a particular time. Given the critical importance of workers perception of their safety in their work environment, over the last decades, safety climate has been rigorously studied in various industrial settings.

As pointed by Gyekye (2008), the link between employees' safety climate perception with safety outcomes have been studied in the manufacturing sector, in the health care setting, in the construction sites among others. In addition to that, safety climate based comparative studies have been conducted between workers involved and not involved in injury, between high and low injury rate plants and units.

Various studies (Adutwum, 2010; Brown & Holmes, 1986; Zohar, 2003) have highlighted safety climate perception of workers as a leading indicator of and accidents and safety performance within an organization. Besides, OHS researchers (Brown & Holmes, 1986; Guldenmund, 2000; Seo et al., 2004) considered safety climate is a construct with many dimensions and certain dimensions of this construct were found to be strong in predicting various safety outcomes. In developing countries like Ethiopia, efforts to overcome the burden of work place injuries have been hampered by limited resources. Due to this, as indicted by Gyekye (2008) organizations in such nations should engage in proactive measures to prevent work place injuries. Assessing safety climate provide early and proactive data for organizations to design and facilitate efficient and successful safety measures and actions.

Ethiopia signed many conventions of ILO since the country joined the organization in 1923. However, Seblework (2006) reported the absence of occupational health and safety policy at a national level. Furthermore, Seblework (2006) also noted despite the burgeoning problem of occupational accidents and injuries in Ethiopia, yet, very limited attention has been given in terms of research effort yand early prevention measures. Enormous Study results in other countries (Adutwum, 2010; Gyekye, 2008; Srinivasan, 2010) are suggesting sound evidences for using safety climate surveys as proactive indicator of organizational safety.

Regrettably, safety climate surveys gain little attention in Ethiopia. All the scant studies conducted in Ethiopia focused only in investigating the mere prevalence of accidents and injuries among workers with little attention in exploring the link between employees' attitude and perception of safety. For that matter, there is also no systematized recording and reporting of occupational injuries and very limited attempts had been made to identify work-related injuries and their determinant even among large industrial workers (Seblework, 2006; Tadesse & Kumie, 2007). It is therefore, in light of this, the current study was primarily designed to respond that call and feel this gap by finding role to safety climate in predicting organizational safety performance. In addition to that, the current research endeavor incorporated the role employee demographics in understanding safety climate to aid a greater understanding of the many dynamics that have impact on the work place.

1.3 Research Questions

In view of the above gaps, the present study sought to investigate employees' safety climate perception in relation to predicting occupational injuries based on a self-reported data from employees' of Kombolcha Textile Factory. Specific research questions that were addressed in this study are listed below;

1. What was the prevalence, types and nature of occupational injuries in the factory in the past 12 months?
2. What is the prevailing safety climate perception of workers in the factory?
3. Is there a significant difference on the safety climate perception level of employees based on their demographic factors?

4. Does a significant association exist between employees safety climate perceptions alongside with their demographics in predicting the likelihood of an injury that would be reported?
5. To what extent the various dimensions of safety climate when considered independently, explained the variance in safety performance among workers?

1.4 *Significance of the Study*

The current study was designed to assess employee's safety climate perception as a predictor of kombolcha textile workers in predicting occupational injuries. Unlike to other studies that focused only on injuries and accident data, this study also encompasses safety climate measures which is considered as leading indicators of safety performance and precursor to the occurrence of injuries among workers.

Given the limited resources that organizations in our country has, safety climate surveys can help to redirect and focus this limited resources efficiently to reduce work place injuries. Hence, the finding from this study was helpful to identify and distinguish certain characteristics that differentiate workers who involved and not involved in injuries the factory. The data from this study would also important to supply information to guide the management of the factory to initiate successful climate-driven initiatives and programs alongside other behavioral change intervention strategies.

The factory, which this study was conducted, consist multiple production departments which pose injuries on workers. Therefore, the finding would also stimulate making valid comparison of work environment safety across departments from the perspective of employees.

The last but not the least, to the researcher's knowledge, there is no published study which is conducted to assess the role of safety climate in predicting occupational accidents and injuries

in any sector in Ethiopia. Hence, the current study would also serve as base line information to undertake studies on similar setting.

1.5 *Delimitation of the Study*

This study was delimited basically in terms of content in investigating the role of safety climate perception along with some selected individual variables of worker's in predicting occupational injuries. Safety climate perceptions of respondents were measured on the nine dimensions of safety climate assessment tool which was developed by Cox and Cheyne (2000). And in terms of sample and geographical location, the study was delimited on the three production process departments' of kombolcha textile factory. Workers, who were not directly involved in the production processing departments such as management and administrative staffs were not incorporated in the current study, because, by virtue of their occupation they were not exposed to occupational injuries this sector has.

1.6 *Definition of Terms*

- **Employee:** operationally defined for purposes of this study as any hourly wage worker in kombolcha textile factory that function within spinning, weaving and finishing department of the production process.
- **Occupational injuries**: defined throughout this study as any physical injury (e.g. laceration, fracture) reported by workers in the factory in connection with their performance.
- **Working department:** One of the three manufacturing process units (spinning, weaving and finishing) in the factory.

- **Safety Climate:** for the purpose of this study safety climate was operationalzed as defined by Zohar (1980), the collective attitudes and behaviors associated with the state of safety at a particular moment.
- **Positive or good safety climate** is indicated as higher score on the 43 items of the safety climate tool.

CHAPTER TWO

2 REVIEW OF RELATED LITERATURES

In this chapter, under the various sections numerous research studies have been reviewed which were conducted on occupational health and safety aspect in the textile industry all over the world with respect to my research objectives. The current review is an attempt to provide a comprehensive a draft of research reports that show the role of safety climate in relation to occurrence work related injuries.

2.1. *Safety Climate: Its origin and Definitions*

Previously, as Antonson (2009) mentioned, organizations have assessed their safety based on records of fatal and non-fatal injuries and accident rates among their workers. Such approaches are known as lagging and reactive indictors of safety within the organization. In addition to that, huge emphasis was given only on the physical, technical and engineering elements in preventing work place accidents and sufferings. However, for the last three decades, as pointed by Zohar (2003) increased interest and focus has been given by occupational health and safety researchers in encompassing workers shared safety perception as well as organizational approach to manage various work place hazards, accidents and injuries.

A distinction can be made between psychologies driven researches versus engineering oriented approaches as far as safety in an organization is concerned. As illustrated by Antonson, (2009) the psychological approach towards organizational safety usually concentrate more specifically on the attitude, feeling, perception and behavior of workers regarding safety in their work environment. Whereas the engineering based approach is more concerned towards improving organizational safety through practical, formal managerial aspects and safety systems.

Safety climate originated from the psychological approach towards organizational safety and as Yule, (2003) indicated more specifically it appears in organizational, social and behavioral psychology literatures especially in the 1980's. The term safety climate was first coined by Zohar, (1980) in his empirical investigation of safety attitudes in Israeli manufacturing sector, and he conceptualized it as a summary of molar perceptions that employee's share about their work environment.

Safety climate was also defined by Mearns, et al. (1998) as workers perception, attitudes and beliefs regarding safety and risks in their work place. Additionally, safety climate was also conceptualized by Cabrera, Isla and Vilela (1997) as organizational members' shared perceptions about their work environments, policies, practices that organizations impose. Similarly, a more recent definition of safety climate was given by Neal and Griffin (2004) as the perception of workers about the value and importance given to safety in their work environment.

Generally, though it is too difficult to provide a single and universally accepted definition of safety climate, fairly broad agreement exist between scholars (Mearns, et al., 1998; O'Connor, et al., 2000; Zohar, 1980) management support and actual involvement towards safety and the overall perception of workers on importance given towards safety by the organization as a paramount and key aspect of safety climate.

For several years, the safety climate and safety cultures were treated interchangeably; however, Neal and Griffin (2004) pointed the distinct nature of safety climate and safety culture though they are closely related. Safety climate was presented by Guldenmund (2000) as the temporal reflection of safety whereas safety culture is more deep and implicit core convictions among workers which can be expressed through safety climate among others.

An interesting comparison between the two concepts was made by Mearns et al, (1998). They regarded safety climate as an organisations mood, on the other hand safety culture as personality of an organisation. According to them, as momentary snapshot of safety at organizations, safety climate measures might be indicatives of the deep personality of the organization (culture).

Safety climate and safety culture measures also employed different methods. Zohar (1980) indicated qualitative methods such as interview, focus group discussions have been used to measure safety culture, quantitative methods were not regarded as efficient to grasp the deep underlying culture within organizations, and on the contrary, safety climate measures have been conducted by quantitative methods such as questionnaires which are convenient to address the momentary states of safety at a particular time.

2.2 *Safety Climate: Common Themes and Empirical Development*

As indicated by Gyekye (2008) safety climate has been rigorously studied especially in the last three decades in all work settings including in health care settings, in the manufacturing sector, and in construction sites. However, Zohar (1980) asserted, the absence of standardized tool for measuring the construct made it difficult to make generalizations and replicate studies within different domains. He also added, due to their useful nature of asking large numbers of people about their opinions in a relatively time - and cost-effective manner, quantitative methods, especially cross-sectional questionnaires, have been frequently employed in measuring safety climate. Safety climate is a multidimensional construct which lacks consensus on the whole elements that make up it among scholars. As considered earlier, Zohar (1980) was the pioneer to develop and administer a questionnaire to identify certain characteristics and factors

that differentiate industries with high versus low industrial accidents rates among workers. After him, enormous amount of questionnaires have been developed and employed widely by various scholars throughout the world as pointed by Seo et al. (2004).

Neal and Griffin (2004) identified issues pertaining to the attitude, commitment and actual involvement of management, safety communication, the importance placed on safety training, the efficiency and effectiveness of safety systems within the organization as major aspect of safety climate measures. According to Zohar, (1980) the most important prerequisite to improve safety within industries is highly relying on the effectiveness of safety initiatives and commitment taken by the management. Therefore, it seems appealing that the role of management was the most frequently measured theme of previous safety climate studies. Similarly, it was also supported by a thematic analysis of safety climate made by Mearns et al. (1998) found that almost 72% of past safety climate studies assessed the role of management.

Another frequently cited dimension on safety climate studies is supervisory factors. Studies by Thompson, Hilton and Witt, (1998, cited on Yule, 2003) also dictating that organizations that have strong management support for safety was also found to have considerable and positive supervisory support. Oliver, Cheyne, Tomás, & Cox, (2000) were also reported the important role of supervisory factors in prevention of accidents by down warding safety climate elements towards the workers.

Management concern, management activity and workers risk perception were the three dimensions that were supported on a study done by Brown and Holmes, (1986) among manufacturing workers in North America. Another research by Dedobbeleer and Béland (1991)

also confirmed management commitment and worker involvement as more appropriate dimensions to measure safety climate.

Safety climate has been also frequently mentioned in associations with non-human factors like safety communications, safety trainings, safety policies, practices and equipment's. Safety communication was also included as one of the dimensions of the broad psychological safety climate. A study by Koys, and DeCotiis, (1991) also reported positive and effective safety communications within industries was associated with increased employee's knowledge and consequent behaviour towards safety.

On the whole, as it is stated earlier, there is no consensus among researchers on the exact constructs of safety climate. However, a review made by Seo, et al. (2004) on 16 occupational safety climate scales and questionnaires revel that the attitude and commitment by management, the role of supervisors, co-workers and colleagues safety support and, workers participation in decision related to safety were the most common dimensions and reoccurred themes of safety climate surveys.

2.3. Theories on Safety Climate –Injury Relationship

Over the past years, various scholars have tried to show the link between safety climate and certain safety outcomes such as injuries and accidents among industrial workers. To begin this, it is wise to deal briefly the theoretical model that drives the link between safety climate and variety of safety outcomes.

Although various research reports are dictating the empirical evidence on the predicting role of safety climate and occupational injury rates, it was suggested by Zohar, (2003) that, the link between safety climate and organizational safety records should also be supported by a

theoretical model. He illustrated, safety climate perception of workers within a particular organization affect safety records in such manner: (a) Safety climate perceptions of workers influence behavior-outcome expectancies; (b) Employees expectancies can influence prevalence of work related safety behaviors; and consequently, (c) employees behavioral safety influences company safety records. Even though safety climate is usually regarded as precursor of occupational injuries, according Zohar, (1980, 2003) since injuries also affect climate perceptions, occupational injuries are also considered to have a role in predicting of safety climate (See Figure 1). This is because when work place injuries occur; they are the primary signals about the underlying safety climate found in that particular organization.

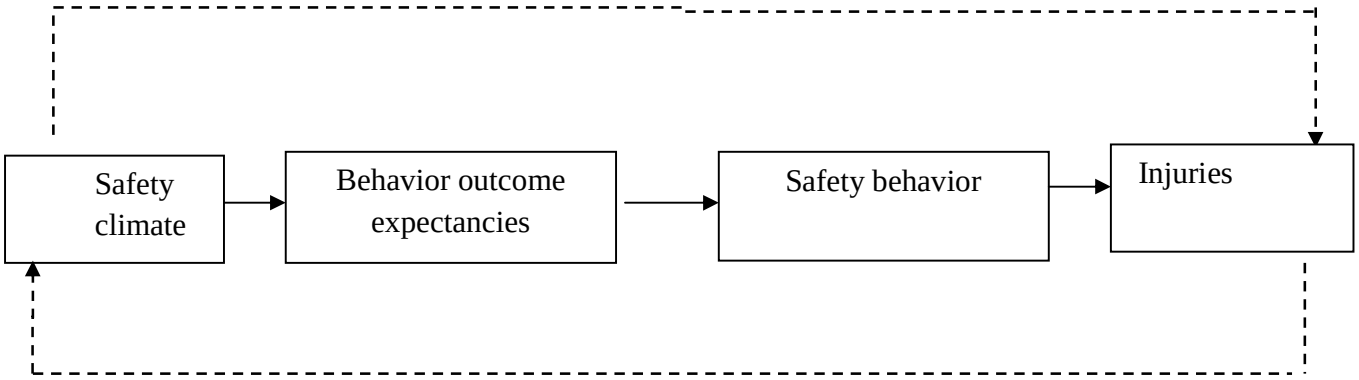

Figure1. The Safety Climate Injury Relationship based on Zohar (1980, p.127)

2.3.1 *Social Exchange Theory*

Social exchange theory was originally introduced by George Homans cited on Adutwum 2010) and more developed and expanded by peter m. Blau (1964). To state this theory shortly, it is all about on the pattern and interaction of two parties that is grounded their relationship on mutual benefit. The most important concept here is the two parties shall perceive their relationship as beneficial for both of themselves unless it will result in leaving by the either party who perceived the cost outweighs than the gains. Social exchange theory (SET) regarded as the

most influential conceptual paradigms for understanding workplace behaviors. Reciprocal interdependence emphasizes contingent interpersonal transactions, whereby an action by one party leads to a response by another. If a person supplies a benefit, the receiving party should respond in kind (Tsui, Pearce, Porter &Tripoli, 1997)

Safety climate as already mentioned, encompass the value given by the organization to safety. The above mentioned theory might have relevance within the workplace, as suggested by Tsui, et al. (1997) employees who perceives high value and concern given to safety by significant people in their work place such as their mangers, supervisor and even their co–workers tend to establish reciprocate for what they enjoy by engaging in safety related exchanges and much compliance with safety standards not only for themselves but also for their colleagues.

2.3.2 Expectancy – Valence theory

Another explanation also can be derived from Expectancy – valence theory which was proposed by Vroom, (1964). Vroom asserted any behaviour is resulted from conscious analysis of the final outcome and the main goal is to maximize and generate higher level pleasure and reduce pain. Based on this theory, it easy to speculate that employees will be highly motivated to act in accordance with safety standards if they believe these behaviours are important and valued by their organization so as to achieve their needs. To put these in another way, employees within organizations that have higher level of perception of safety climate are highly motivated to engage in safety related behaviours than employees with lower safety climate perception.

As indicated by Mearns et al. (1998) the central components of safety climate construct are formed from the conjunction of workers attitude, behavior, and beliefs as far as safety within their work place are concerned. Safety within an organization can be expressed through official

and self-reported accident data, safety related behaviour of workers and their compliance and motivation towards safety rules and procedures as reported by Guldenmund (2000).

Burke , Sarpy, Tesluk, and Smith-Crow (2000) defined Safety working behaviours as all the efforts, tasks, activities taken by employees in their work setting to improve their safety in particular and organizational safety in general. Safety behaviours among others might include following work place safety standards and regular use of personal protective equipment.

As Geller, (2001 cited on Adutwum, 2012) contrary to Maslow's theory of hierarchy of needs, which speculate the need for personal safety and self-preservation safety rule violations, recklessness have been noted to account significantly in occupational injuries. More specifically Zohar and Luria (2003) asserted 40% of work accidents as resulted from workers' failure to use protective equipment

A report by Mearns, et al. (1998) has also showed injuries and accidents in the work place can be best predicted by the behavior of workers. A research report are suggesting that employee's minimal compliance with safety rules and procedures, carelessness and unsafe working behaviours accounted for a greater share of occupational related sufferings and accidents.. Thus, Workers safety climate levels are expected to positively correlate with certain safety oriented behaviours .This was supported by a study conducted among hospital workers, by Neal and Griffin (2004). They found significant relationship between safety climate perception of workers and their willingness and motivation to act safely in their work setting. A report by Cox and Cheyne (2000) also showed the direct relationship between employees' participation and involvement and their safety climate perception.

Researchers nowadays are arguing that safety climate (workers perception of their safety at their workplace) is directly related with the increasing of workplace injuries and accidents. Cheyne and Cox (2000) conducted a study on 13 European manufacturing plants and concluded that low accident frequencies were observed on employees' with more positive attitude and compliance and strong managerial involvement and commitment towards safety.

Similarly as indicated Lee ,(1998 ,cited on Adutwum,2010) low accident plants were characterized by the presence of high level of formal and informal communication about safety, strong commitment and positive leadership style by senior level management and the availability of safety trainings.

A past Meta -analytic study by Clark, (2006) indicated work environments that are viewed as supportive of safety are frequently linked with fewer work place accidents and injuries than those as not supportive of safety. Accidents and injury rates among workers are also reported to negatively relate with their perception of safety climate as a study by Clarke, (2006) suggested.

The role of management as presented earlier, is the major aspect of safety climate construct. Studies in this regard also reported Clark, 2006) poor management attitude and involvement was the major cause and factor of workplace accidents and injuries. Yule (2003) also showed workers with high frequencies and involvement with accidents had perceived negative and pessimistic attitude towards their management effort, commitment towards safety and the existence of better safe work practices in their work setting.

2.4 Safety Climate and Demographic Factors

According to Hinze (1997) demographic factors have been a major source of variation in safety climate perception and consequent safety behavior of workers. This was supported by other research report made by Siu, Phillips and Leung (2003), on their investigation of age difference with regard to safety climate and safety performance of 374 Chinese workers in the construction sector. This study revealed, as compared to their young counterparts, older workers tend to have a more positive safety climate perception. Similarly, Choudhry, Fang, and Lingard (2009) found positive safety climate perception among older workers and with those that reported to have better family supports than others. They also added workers level of education was associated with perception of safety climate. Workers with highest level of education tend to have a better safety climate perception of their company. A study conducted by Fang et al. (2006) employed logistic regression analysis to investigate the association between safety climate with demographic and certain personal characteristics of employees. The study pointed age, marital status, education level, safety knowledge, drinking habits of workers were found to have a relationship with their level of safety climate perception. However, this report asserted, workers demographic characteristics such as gender, length of work experience with their company, were found to have little influence on the level of perceptions of safety climate.

Though the above research reports linked demographic factors with the safety climate level of employees, Cooper and Phillips (2004) suggested personal factors are not that much important in safety climate researches. According to them, the safety climate construct is far distinct from employees' demographic characteristics both theoretically conceptually. Rather than focusing on demographic factors, (Cooper & Phillips, 2004) safety climate surveys should redirect their attention on safety climate differences that might exist based on the types of work

activity and other site situational conditions. A study by Adutwum (2010) found no significant differences in the safety climate level of 273 mining workers based on respondents' demographics.

2.5 Occupational *Injuries in the Textile Industry*

In Ethiopia, various studies (Sebelwork, 2006; Tadesse & Kumie, 2007) indicated that occupational injuries are highly significant in the country especially at the manufacturing sector. Particularly, occupational injuries were more significantly higher among workers in the textile factories as compared with other sectors. An assessment made by the Amahra Regional State Bureau of Labor and Social Affairs (ARSBOLA, 2007/2008) on 32 enterprises on the region reveled approximately 35% of the total reported occupational injuries were constituted only from Bahir Dar and kombolcha textile factories. According to this report, the work setting in these two factories are characterized by hoot working rooms, extreme noise and unprotected machine moving parts.

In most studies, abrasion, cuts, burns, puncture and fracture were the common types of injuries among workers in the manufacturing industries. An assessment by Tadesse and Kumie (2007) indicated abrasions (23.2%), cuts (19%, puncture (14.4%) and dislocation (6.5%) were common injures In 2007/ 2008, ARBOLSA reported abrasion (62%), cuts (12%) and puncture (67%) were common types of injuries. previous research report by Senbeto (1991) on occupational injuries among Akaki textile workers reveled prick (32.9%), laceration (30.8%), were the most commonly seen injury types. As far as the most frequent part of body injured are concerned, a study done by El –sabbabwi (1978) in Alexandria reveled , injuries were highly depended on the nature of departments in the textile sector , however, it was found 27.5 %

workers in the spinning process are exposed to hand injuries. Similarly, a study among textile factory workers in Addis Ababa showed fingers, hand and lower leg were the most by constituted 42%, 13%, 18% injured body parts respectively. A research done by Ethiopian ministry of health department of environmental health indicted more injures are prevalent on hands and fingers.

A number of individual factors are found to be associated with work place injuries. For example a study conducted by Bhattachersee (2003) in France showed gender difference in experiencing injures. According to this report men had higher risk of experiencing occupational injuries than women .However; this was not supported by a study conducted in Ethiopia on Tendaho Agriculture workers by Yiha (2007) no significant difference was seen between the two genders in terms of experiencing work place injuries.

Another frequently stated individual variable as far as experiencing injuries concerned was age. A serious of research reports by various scholars (Frone, 1998, D. Rhys & J. Paul 2005, cited on Taddese & Kumie 2007, Fulle 1998) asserted workers age is negatively related to work injuries. It was frequently documented that age and occupational injuries are negatively related because older workers are more experienced on the job and have greater job knowledge and job skills than younger workers. More specifically an assessment made by Ethiopian Ministry of Health, department of environmental health reveled majority of occupational injuries in the manufacturing sector were in the age group of 26-30.

In addition to the above individual factors, Most studies conducted on occupational health and safety issues in developing countries (D, Rhys & Paul, 2007, S, Asim,et al ,2004 cited on

Taddesse and kumie 2007) showed increased educational levels among workers have been associated with decreased work-related injuries.

Despite many studies addressed the prevalence and nature of injuries among workers, surprisingly there was no any study that tried to assess safety climate perception of employees with regard to their safety performance in any sector. The principal aim of this study is therefore, to examine the relationship between safety climate perception and actual injury involvement in the past 12 months among workers of Kombolcha Textile.

2.6 Conceptual Framework of the Study

Based on review of past literatures as per the objective of this study, a conceptual framework of the study was as depicted in Figure 2. In this model, it is expected participants gender, age, length of service duration, education level and their working departments would report different level of safety climate perception which in turn affects their safety performance. It is also expected that the safety performance of workers (injury involvement) will greatly varied based on the perceived safety climate (score on the safety climate scale).

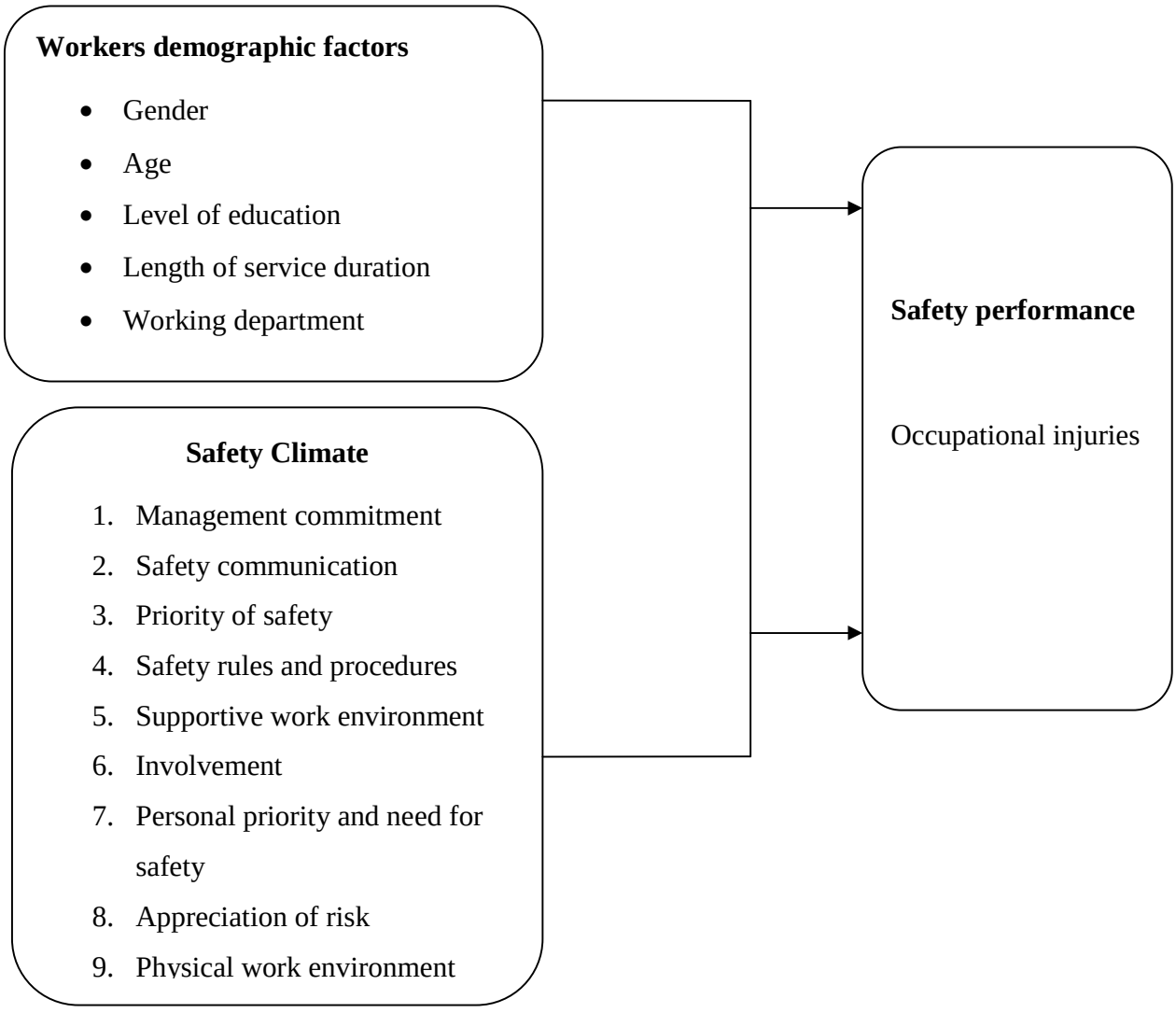

Figure 2: Conceptual Framework of the Study

CHAPTER THREE

3. METHODOLOGY

3.1 *Study Design*

Comparative cross-sectional study was implemented to assess the existed safety climate perception of workers and its association with self-reported occupational injuries among workers of Kombolcha Textile Factory.

3.2 Study Area

This study was carried out on workers of Kombolcha Textile Factory. The factory found at Kombolcha town, Amhara region, which is located 371 km out of the capital Addis Ababa. It was established in 1986 E.C. currently, it is among five textile factories owned by the government. The factory consist the most manufacturing process of textile industry (spinning, weaving and finishing). A total of 1564 workers are currently working among these 58% are male and the rest 42% are female workers.

3.3. *Study Population*

All workers of Kombolcha Textile Factory in the three production process departments (1023) irrespective of gender and age are the target population for the current study. However, this study does not incorporate those workers who were not directly involved in the production processing departments such as management and administrative staffs. Since by virtue of their occupation, they were not exposed to occupational injuries this sector has.

3.4 *Sample Size Determination*

The sample size for this study was determined by using single population proportion formula of one sample with a dichotomous outcome variable. The prevalence of occupational injuries among workers in small and large scale industries in Ethiopia based on a previous study by Tadesse and Kumie (2007) was 33% and the desired margin of error (E) of 0.05 was used.

$$\frac{n = (Z\alpha/2)^2 P (1- P)}{E^2} \qquad \frac{n = (1.96)^2 0.33(1-0.33)}{(0.05)^2} = 340$$

$$nf = \frac{n}{1 + (n /N)} \qquad nf = \frac{340}{1+ (340/1023)}$$

nf =255 + 5 % non-response rate used maximize the sample size

nf = 268

Where: n: Sample size to be calculated from the population

nf: Total sample size to be studied

N: Source population (1023 workers).

Zα/2: A standard Z score 1.96 corresponding to 95% confidence level

$E^{2:}$ the desired margin of error

P: The prevalence of occupational injuries among workers in small and large industries in Ethiopia by Tadesse and Kumie (2007).

3.5 *Sampling Method*

Assuming safety climate perception and the occurrence of work related injuries among workers in the factory varies with their working unit; the sampling procedure was designed to be convenient for such departmental comparison. Therefore, a stratified random sampling method was employed in this study. First, major departments of the production site of the factory (spinning, weaving, finishing) was first stratified, and selection of participants was made by using simple random sampling by using lottery method from each selected unites in the major departments.

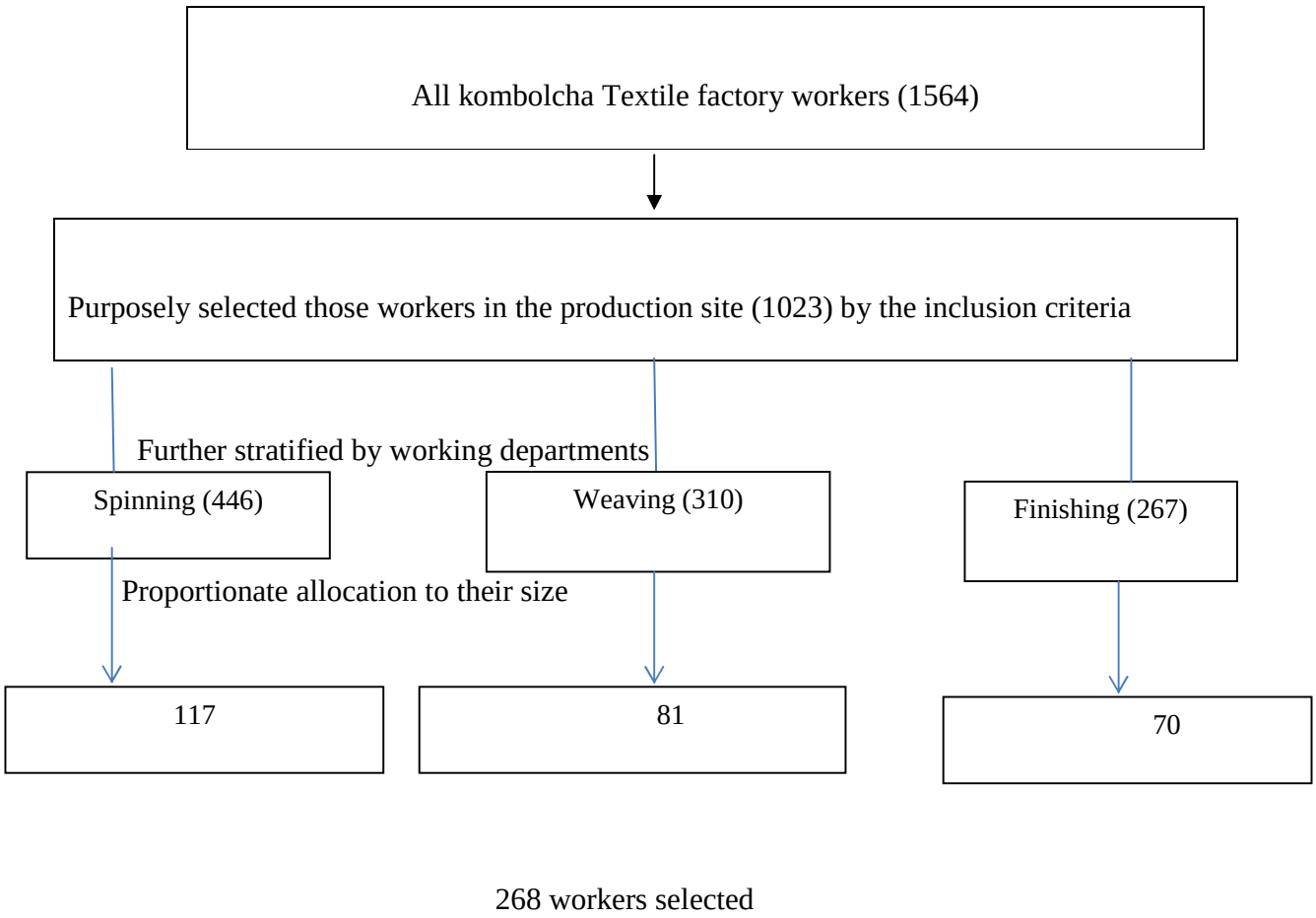

Figure 3: Schematic Presentation of Sampling Procedure Employed in the Study

3.6. *Research Instrument*

Measuring safety climate requires an instrument to record employees' self-reported perceptions of safety issues at their work places. As indicated by Yule (2003), safety climate instruments provides a total summation of score for items pertinent to various dimensions that stands for measuring safety attitude and behavior within the safety climate survey.

A three sectioned questionnaire was used in this research process to collect data regarding workers demographic factors, prevalent safety climate and safety performance through measures of occupational injuries. The Safety Climate Assessment Tool (see Appendix A) which was originally developed by Cox and Cheyne (2000) was employed in order to investigate safety climate perception of employees in the factory. The SCAT has a total of 43 items on 9 different dimensions that are measured on a 5 point Likert scale. The total score in the scale can be obtained by adding the points of each item in the scale and the scores can range from 43 to 215.

The nine components of this safety climate tool was (1) management commitment, (7 items) [e.g. Corrective action is always taken when management is told about unsafe Practices]; 2) communication (5 items) [e.g. There is good communication here about safety issues which affect me]; 3) priority of safety (4 items) [e.g. Management considers safety to be equally as important as production]; 4) safety rules and procedures (3 items) [e.g. Some health and safety rules and procedure are not really practical]; 5) supportive environment (6 items) [e.g. Co-workers often give tips to each other on how to work safely]; 6) involvement (3 items) [e.g. I am involved with safety issues at work]; 7) workers personal priority and need for safety (5 items) [e.g. Safety is the number one priority in my mind when completing a job] ; 8) workers personal appreciation of risks (5 items) [e.g. In my workplace the chances of being involved in an

accident are quite large] and 9) the physical work environment (5 items) [e.g. I cannot always get the equipment I need to do the job safely].

Alongside to the SCAT, four other questions that were previously used by Yiha (2007) were also employed to assess safety performance in the company. At first, participants were asked about their involvement in an occupational accident in the past 12 months and if this accident was associated with injury or not. Then, they were also asked to describe the frequency of the injuries and according to the most common type (nature) and anatomical location of body part injured.

3.7 *Translation and piloting procedures*

The researcher in the current study selected the SCAT by the following steps. First, using the theoretical model that was presented in the literature part of this research report as fit guideline, a thorough review of scientific literatures in the area was conducted. This thorough review helped the researcher to identify the most common themes of safety climate instruments and how certain variables should be operationalzed. Through this review, the SCAT developed by Cox and Cheyene (2000) was selected. All the nine safety climate dimensions in the current tool were once used by other safety climate based surveys in the past (Adutwum 2010, Brown & Holmes, 1986, Dedobbeleer & Béland 1991).

The translating process of the original safety climate was done by the researcher with the help English language lecturer who is also excellent in the language context of workers. The translation was highly aimed at maintaining the conceptual equivalent of a word or phrase with the original tool. Second, the translated version of the instrument was also assessed by safety officer of the organization. The rationale behind this was the researcher in this study believed;

the safety officer of the company is familiar with some safety jargons, terminologies and the content area of the SCAT in the language of the desired target population. Some words in the questionnaire were further revised to improve clarity. The above steps helped to ensure or at least to improve the content and face validity of the instrument that was used.

Then after, the final Amharic instrument was first pilot tested on a total of 30 employees selected at random from the three departments of KTF. Considering the differences in the number of workers employed in each department, the sample for the pilot study was contained 30 workers 13 of them were randomly selected from spinning, 9 workers from weaving and the rest 5 workers were from finishing. For each questionnaire, a cover letter was attached that explains the whole nature of the study. For the 30 workers in the pilot study meeting was arranged and all randomly selected workers were presented, the purpose, nature and goal, the confidentiality of their responds in the study was explained to participants orally in detail. All agreed to participate, so that the researcher was able to secure a 100% participant rate in this stage.

Pilot participants were instructed to read each item in the questionnaire carefully and indicate their safety climate perception towards their work. The researcher and the safety and training officer of the organization offered assistance in clarifying some items that were unclear to the participants. Pilot samples took approximately 25 minutes to complete the whole items in the study. After collecting the questionnaires, participants were asked to give any comment and more specifically on the interpretation of items in the scale. None of the questions in the instrument were judged as such to be difficult by the pilot participants. These processes were very paramount in incorporating the useful feedback obtained from the pilot participants and

safety officer of the company as some amendments were made based the advice received in order to finalize the last Amharic version of the SCAT.

3.8 *Reliability Index*

The Cronbach's Alpha was used to examine the indicative reliability of the SCAT from this pre-tested sample. The Cronbach's Alpha coefficient was used in order to assess the internal consistency of items in the SCAT. As indicated by Hayes et al (1998) using Cronbach's alpha level as indicator of internal consistency of items in the scale is common among safety climate surveys. Therefore, putting together all the 43 items of the SCAT, the coefficient of Cronbach's alpha level obtained was 0.96.

In addition to that, the internal consistency of items in each dimensions of the SCAT was estimated. The internal consistency of each dimensions of the SCAT ranged from 0.61 to 0.9. Among the nine dimensions, seven dimensions of the SCAT achieved coefficient alphas which are above 0.7. Even though, the fourth (safety rules and procedures) and the seventh (involvement) dimensions' of the SCAT have alpha level which is below .7 they are kept in the main survey. As recommended by Schmitt (1996) the use of alpha level which is above 0.7 is not needed by considering the length or the number of items the group comprises of. Hence it would be expected to have lowered alpha value. According to him, a Cronbach's alpha of 0.61 can be acceptable if the number of items in the group or dimension is three. The instrument used in the current study which was also reported to have a good internal consistency (.80) in another study done by Srinivasan (2010).

3.9 *Study Variables*

- **Criterion Variables:** with respect to the objective of this study employees actual injury involvement for the past 12 months was considered to be the criterion variable.
- **Explanatory variables:**

  One of the predictor variables in this study were selected socio demographic characteristics of employees including gender, age, educational level, length of service duration and working department.

- Total Safety climate perception score of respondents when all the 43 items of the SCAT summed together.

The study also tried to examine the relative contribution of the nine dimensions of the SCAT in explaining safety performance when they considered independently.

1. Management commitment -workers perceptions of their management's overt acts and commitments to health and safety issues.
2. Communication- The nature and efficiency of health and safety communications flow within the organization.
3. Priority of safety: operationalzed as what workers feel about relative status of health and safety issues within the organization.
4. Safety rules and procedures: employees view on the efficacy and necessity of rules and procedures.
5. Supportive environment: The nature of the social environment at work, and the support derived from it.
6. Involvement: The extent to which safety is a focus for everyone and all are involved

7. Personal priorities and need for safety: employee's view of their own health and safety management and need to feel maximum safety.
8. Personal appreciation of risk: how individuals view and value the risk that is presented associated with their work.
9. Physical work environment: how employees perceive the general nature of the work environment.

3.10 *Data entry, Coding and Verification*

After the relevant data collected, since the SCAT used in the study have positively-keyed" and "negatively-keyed" items , it is compulsory to engaged in reverse scoring process for those16 reversed items before computing any type of analysis on the data. For example, if a participant in the study responded "1" (Strongly Disagree) to the item "Management acts only after accidents have occurred", then recoding was done this individual's response to a 5. Thus, the reverse-scored item in the scale now has a high score (a 5 instead of a 1), which indicates a high level of safety climate. Similarly, the researcher transformed all 2's to 4's.

After this, tremendous effort was also placed to check other improper entry of the data by randomly checking each case frequency distribution was checked for all items to make sure it is free from extreme cases. The main objective in this process was to identify the presence of any responses that are not within the appropriate range of coded responses.

3.11 *Data Analysis Techniques*

The analyses for this study were conducted as per the research questions stated in the introduction part of this research report. Accordingly, the analyses comprise three phases;

First, descriptive statistics methods like frequency, percentage calculation, mean and standard deviation was used to describe the prevalence, type and nature of occupational injuries and scores on the safety climate perception tool.

Second, inferential statistical techniques such as independent samples t – test and one-way ANOVAs were conducted to examine the difference in the level of safety climate perception as to certain demographic factors including gender, age, and level of education, work experience and working departments.

Third, logistic regression was used to model what factors predict the likelihood of an injury that would be reported among workers in the factory. As indicted by Neuman (2000), Discriminant function analysis as a statistical technique is employed to distinguish any characteristics that differentiate two or more groups. This statistical technique could be also used to examine the relative importance of a set of variables in making distinctions between the groups. Therefore, considering the significant nature of safety climate in predicting injuries in the earlier analysis, a discriminate function analysis was run to examine the relative importance of the nine dimensions of the safety climate tool in relation to explaining the variance with safety performance among workers. The whole analyses process was done on SPSS version of 20 with an alpha level of 0.05 and 0.01.

3.12 Ethical Considerations

First of all, a letter, which was written by Addis Ababa University, School of Psychology was accepted by the senior management body of the organization. A link was formed between the researcher and the company safety and training officer. In this regard, the researcher was able to get the maximum support from this body throughout the whole study process. Questionnaires were distributed to workers who were to participate in the study.

A well written informed consent form was attached as a cover page on each questionnaire that explained the true purpose and, nature of the study, and it clearly declared the voluntary participation of participants. The wishes of those who don't want to participate were fully respected. To assure the anonymity and confidentiality of participants, there was no any occasion that requires respondents to mention their personal profiles or names.

With respect to filling out the questionnaire, self-administered questionnaire approach was employed. This approach was selected because it allows participants to say whatever they feel as far safety in their factory is concerned without any interviewee bias. Moreover, this technique also enabled the researcher to collect a large amount of data within a very short period.

CHAPTER FOUR

4. RESULTS

4.1 Preliminary Analysis

From the 268 workers approached to this study, the actual number of participants was 260 yielding 97% response. However, only 255 cases were valid and used in the analysis. The five cases were not included because these respondents were not fully responded for the questionnaire.

4.2 Demographic Characteristics of Respondents

Among the 255 participants in the study, the majority of them, 166 (65 %) were males and the rest 89 (35%) were females. The mean age of workers in the study was 37.34 years and (SD 6.34) .The minimum and maximum ages level observed were 23 and 55 respectively. Regarding education level, 101 (39.6%) of participants reported to have some primary level education, 85 (33.3%) were secondary education and above and 69 (27.1 %) were only able to read and write. With regard to length of service duration of participants, the data revealed 75 (29 %) of the participants reported 1-5 years of service duration, 92 (*36 %)* reported having 6-10 years, 45 (*18 %)* reported having 11- 15 years and 43 (*17 %)* reported 15 years and above work experiences in the factory. Concerning to working departments, from the total of 255 participant 111(43.5%) were in the spinning, 76 (29.8%) were in the weaving and the rest 68 (26.7) were under finishing department.

4.3 *Occupational Injuries*

Among the total study participants, 75 (*29%)* had an incident that resulted injury in their work setting in the past 12 months. Hence, the overall annual prevalence rate of work related injuries in the Factory was 294 per 1000 exposed workers. Regarding the frequency of injury occurrence, 52 (69%) had reported once, 20(27%) had twice and only 3(4%) reported to have had three or more times. Analyzing demographic factors of those 75(29%) respondents who reported an injury, 16 (21%) were female whereas the rest 59 (78.7%) were male workers. With regard to age of employees, 52 (*69 %)* of injuries were observed on workers with the age group of <34, than those between the age of group of 35-39, which was 18 (*24%).* The lowest 5 (*6.7%)* prevalence of injury was seen on employees under the age group of 40 and above.

As far as length of service duration concerned, high number 31(*41%*) of injuries was seen with employees who have 1- 5 years of work experience. The least prevalence level of injury was also observed with employees who had 15 and above years of service duration. As to working department, among those employees who reported injuries in the last 12 months, the highest percentage (*39 %)* of injury were in the spinning department, followed by workers in the weaving (33 %) and the rest *28%* were under finishing department.

In terms of anatomical location, as summarized in Table 1, Fingers 33(*43 %),* Hands 14 (*19%),* Lower leg 11(*14%)* Around Shoulder 5(*6.7%),* Face 5(*6.7%)* were the most common affected body parts.

Table 1

Anatomical Location of Most Common Affected Body Parts due to Injuries among Workers of Kombolcha Textile

Part of body affected	***Frequency***	***%***
Fingers	33	42.7
Hand	14	18.7
Lower leg	11	14
Around shoulder	5	6.7
Face	5	6.7
Knee	2	2.7
Eye	2	2.7
Ear	1	1.3
Teeth	1	1.3
Other parts	1	1.3
Total	75	100%

As far as the types of injuries were concerned, as presented in Table 2, Laceration 34(*45%),* Abrasions 16 (*25%),* Fracture 12 (*16%*), Dislocation of joints 6 (*8%)* were the most commonly seen injury types among of those respondents who reported to had occupational injuries in the last 12 months.

Table 2

Common types of occupational injuries among Employees of Kombolcha Textile Factory

Types of injuries	***Frequency***	***%***
Laceration	34	45.3
Abrasions	16	21.3
Fracture	12	16
Dislocation of joints	6	8
Multiple injuries	3	4
Amputation	2	2.7
Burn	1	1.3
Cut	1	1.3
Total	75	100

4.4 *Safety Climate*

The mean score of respondents in this study was for the 146 and 30.4 (*SD*) with a minimum and maximum score of 90 and 198 respectively. The prevailing safety climate perception shared by employees was measured through the composite score mean per the nine dimensions on the SCAT. The highest mean score was observed for the personal priority and need for safety dimension (*M=4.06, SD 1.0*). Generally speaking, safety climate perception of employees in the factory was quite good. For the 8 dimensions of the SCAT, the means were above 3 with the exception of the third dimension (priority of safety *M= 2.67, SD = 1.0*) out of the possible highest score of 5.

Table 3

Respondents Mean and Standard Deviations on the nine Dimensions of the SCAT

Dimensions on the SCAT	***Items***	***M***	***SD***
Management commitment	7	3.22	.91
Safety communication	5	3.27	.86
Priority of safety	4	2.67	1.0
Safety rules and procedures	3	3.30	.85
Supportive work environment	6	3.36	.95
Involvement	3	3.56	.77
Personal priority and need for safety	5	4.06	1.0
Personal appreciation of risks	4	3.02	.74
Physical work environment	6	3.10	.81

4.5 Group Differences

By considering the conceptual framework of this study which is illustrated in Figure 1, one way ANOVAs, and independent samples t- test were conducted to determine the difference on the safety climate perception mean scores of workers on the basis of their demographic factors.

Relative to the gender of workers in this study, males accounted for 166 (65 %) of the participants while 89 (35 %) reported as female. An independent-samples t-test was conducted to compare the safety climate perception scores of the two groups. The result of the independent sample t -test indicated that there was no significant difference in safety climate mean scores of males (*M=, 144.43.9, SD= 31.5*) and Females *[(M = 149.8, SD=28); t (200) = 1.28, P= 0.10)]*. The magnitude of the differences in the means was calculated by using eta squared and it indicated the difference was quite small (.006). In other words, employees' sex can only explain 6% the variance in safety climate perception mean score.

As far as the age range of respondents in this study concerned, it has a range of 23 -55 years with a mean age of 37.3 years and (*SD=6.3*). For the purpose of this analysis, participants were categorized in to three groups according their age (group 1: < 34; group 2: 35 -39 and group 3: 40 and above). A one-way between-groups analysis of variance (ANOVA) was conducted to explore the difference on the levels of safety climate scores based on employees' age at an alpha level of .05. The test for homogeneity of variance was significant [*Levine's F (2, 253) = P<0.001*)] indicating that this assumption of anova was violated. However, Anova is robust to violation of this assumption as long as the difference between the large group and the small group variance is not more than four or five times and even normality of the data not fully meets.

Hence, the Robust test of equality of means by using Brown –Forsythe statistic was used to report this finding. A statistically significant main effect difference at $p< .05$, across the three age groups, *F [(2,231.8) = 31.76, P =.001)]* indicating the three age groups significantly differed in their safety climate perception scores. The calculated effect size by using eta squared showed the difference between the three age groups was large (d =0.2). In other words, 20 % of the variance in safety climate scores of employees can be explained by their age.

A Post-hoc comparison was done by Dunnett's C to determine which age groups means were significantly differed (see Appendix D). The safety climate mean score of employees at group 1 (<34 years), was significantly different than those in the group 2, *[(*35-39 years, *P=.001*)], and in the group 3 [(40 years and above, *P=.001*)]. Similarly, there was a statistically significant, *F [(2,231.8) = 31.76, P =.0001)]* difference between employees in the group 2 and those in group 1. However, there was no significant difference between employees in group 2 and 3.

Among employees' demographic factors, length of service duration in the factory showed statistically significant difference on the mean of employees safety climate score. One way analysis of variance was run to assess the difference at alpha level of P< 0.05. A statistically significant difference *F [(3,196) = 4.82 P =.003)]* was obtained on the safety climate perception mean score of respondents based on the length of work experience they have in the company. The calculated d value was (*d= .05).* It suggests that length of service duration of employees explained a moderate variance in their safety climate perception levels.

A Post-hoc comparison was done by Dunnett's C to determine in which group of employees the mean in safety climate score was significantly differed. The mean score for employees who reported 1-5 years of service was significantly different than those employees with 15 years and

above experience *F [(3,196) = 4.82 P =.003)]* . Similarly, there was a significant difference in safety climate mean scores of employees between 6-10 years and those 15 years and above *F [(3,196) = 4.82 P =.003)]*. Employees with 11-15 years of experience reported better safety climate scores than those with 1-5 years only *F[(3,196) = 4.82 P =.003)]*. Appendix E presented the detail concerning to Post hoc analysis of the safety climate mean scores of respondents on the bases of their length of service duration.

As to education level of participants concerned, The result of one way analysis of variance confirmed the absence of a statistically significant difference at $p<0.05$ between the groups *F [(2,232) = .137, P =0.87)*]

Finally, safety climate scores of respondents were tested to examine any significant difference that might exist on the base of their working departments'. One way analysis of variance was employed to test whether this difference was statistically significant or not. The result of anova analysis indicated the presence of a statistically significant difference *F [(2,252) =6. 97, P=.001)]* on the safety climate mean of respondents across the three departments at an alpha level of 0.05. The calculated eta squared value was .02. It indicated a minimal effect of this factor in explaining the difference with regard to safety climate scores.

A post-hoc comparison was done by using Dunnett's C to determine in which working department the mean in safety climate score significantly differed (see Appendix F). The mean score for employees in spinning department was significantly different *F [(2,252) =6. 97, P=.001)]* only with those employees from weaving department. Similarly, there was a significant difference between employees under the finishing unit with that of weaving *F [(2,252) =6. 97, P=.001)]* but not with the spinning department *F [(2,252) =6. 97, P=.001)]*.

Table 4

Means, Standard deviations, and Significant Measures of difference on Respondents Safety Climate Perception on the base of demographic characteristics

Demographic characteristics		*N*	*M*	*SD*	*df*	*Sig level*
Gender	Male	166	149	28.	*t (200) = 1.28*	*0.10*
	Female	89	144.4	31.5		
Age	< 34	99	129.8	27.8	*F (2,231.8) = 31.76*	*0.001***
	35 -39	75	151.4	30.0		
	40+	81	161.3			
Level of education		69	144	30.2		
Only able to read and write		101	147	28.3	*F (2,232) = .137*	*0.87*
Primary education		85	147	33.1		
Secondary education and above						
Work experience	1-5 years	75	140	28.3		
	6-10 years	92	145	31.4	*F (3,196) = 4.82*	*0 .003***
	11-15 years	45	145	34.1		
	15+years	43	161	22.7		
Department	Spinning	111	150	27.9		
	Weaving	76	135	31.9	*F (2,252) =6. 97*	*0.001***
	Finishing	68	151	29.9		

*Note: ** significant at p< 0. 05& P<0.01*

4.6. Predictors of Safety Performance

Since the criterion or the dependent variable in the current study was dichotomous, (occurrence of injury or not which is coded as 0 and 1 respectively), a simultaneous logistic regression analysis was used to model what factors influence the likelihood of an injury to be reported by the individual. The predictor variables in this phase were (a) gender (coded female = 0, male = 1), (b) respondents age, (c) education level (d) length of total service duration of service, (e) working department and (f) total score on the 43 safety climate perception items-which is scored in such a way that higher score by employees indicating a more greater and positive safety climate perception.

The independent variables entered were examined for the presence of multicollinearity among them by checking their variance inflation factor. The issue of multicollinearity was not a problem among the independent variables since none of the explanatory variables indicated a tolerance level which is close 0.1. Outliers were excluded from the analysis by using listing residuals of cases with studentized residuals greater than 2.

The result of the logistic analysis indicated that predictor variables entered has a statistically significant improvement over the constant only model X^2 *(8, N =255) = 237.9, P<.001).*The Cox & Snell and pseudo R^2 value was .607. This value suggests that 60 percent of the variability is explained by these set of predictor variables. This indicated that the set of predictors entered in the model discriminate those employees who have reported injured and not injured. Prediction success of the cases in the model was relatively high with an overall prediction rate of 93 % and correct prediction rate of almost 90 % for employees who had injured and 95% for those not injured.

The significance level, the odds ratio, and the 95 % confidence intervals (CI) for odds ratio (OR) for each significant predictor is presented in Table 5. The Wald test reported among the five criterion variables entered, employees' sex, age, length of service duration, and safety climate perception score were statistically significant predictors of injury among workers of KTF. However, employees' level of education and their working departments were not statistically significant in the model.

Table 5

Result of Logistic Regression Model to predict Occupational Injuries among Employees of KTF on the bases their Demographic factors and safety Climate Perception Score

Variables entered		***Had injured***		***Sig***	***OR***	***95%CI for OR***	
		No	***Yes***			***LB***	***UB***
Sex	Male	73	59	.026*	4.27	1.189	15.356
	Female	107	16				
L*of*service	< 5 years	44	31	.040*	5.69	1.082	29.970
	5+years	136	44				
Educ level	Able to read & write	47	22				
	Primary education	76	25				
	Secondary education and above	57	28	.215			
W dep't	Spinning	82	29	.4			
	Weaving	51	25				
	Finishing	47	21				
Age				0.044*	.869	.753	1.003
Total Score on the SCAT				0.001**	.837	.785	.892

*Note: The Cox & Snell and pseudo R^2 = .607, X^2 = 237.9, with df = 8 (p < .001), N = 255 A forced entry method was used. * Significant at P<0.05, ** P<0.05, lof service =length of total service duration, W dep't = working department SCAT =safety climate assessment tool, OR=Odds ratio, CI=confidence interval, LB= lower boundary, UB= upper boundary*

As it can be observed from Table 5, the influence of employees gender was strong; males were 4.2 times (with a large confidence interval of 95% *=1.18, 15.35*) more likely to be injured than females. In this phase of analysis, employees' age was treated as a continuous variable without any further categorization. And it presented as a significant predictor of occupational injuries among workers in this study. As the odds ratio value in Table 5 indicated for every single year increase in workers age the likelihood of injury involvement decreased by 0.86(*CI.753, 1.003*) factors other things being equal.

Another significant predictor of injuries was the length of service duration by respondents, employees with 1-5 years' of service duration were 5.6 times (*CI= 1.082 ,29.97),* more likely to face injuries than other employees with 6 years and above. Concerning the total scores of workers on the SCAT, for each single increase on their score, the likelihood of an injury to be reported decreased by 0.837 (*CI=.785, .892)* factor controlling the other significant predictor variables.

Furthermore, a simultaneous Discriminant analysis was conducted to determine the relative contribution of each dimension of the SCAT in explaining the variance on safety performance when considered independently. The nine dimensions on the SCAT were (1) management commitment, (2) safety communication, (3) priority of safety, (4) safety rules and procedures, (5) supportive environment, (6) involvement, (7) workers personal priority and need for safety, (8) workers personal appreciation of risks and (9) the physical nature work environment. These dimensions of the SCAT were assessed in accordance with a greater score on each of them indicating a more positive evaluation of the aspect. The overall, Wilkes's lambda was significant *A=.238, X^2 (9, N= 255) = 356.569, P < 0.001*) suggest that the overall predictors differentiated between the two groups safety performance (those employees who injured and not injured).

Table 6

The Standardized coefficients and Correlations of Predictor Variables of the Discriminant Function

Predictors	***Correlation coefficients***	***Standardized coefficients***
Supportive work environment	.814	.78
Safety communication	.686	.51
Management commitment	.669	.4
Priority of Safety	.538	.10
Physical work environment	.453	-.16
Safety rules and procedures	.426	-.15
Appreciation of risk	.380	.05
Involvement	.152	-.14
Personal priority and need for safety	.149	.24

The within group correlation between the nine dimensions of the SCAT and the Discriminant function as well as the standardized weights is presented in Table 6, based on this coefficients , supportive work environment dimension of the SCAT demonstrated the strongest relationship with the Discriminant function. Whereas, safety communication and management commitment dimensions of the SCAT showed slightly moderate relationship. The rest six dimensions held weakest relationship with the Discriminant function.

CHAPTER FIVE

5. DISCUSSIONS

The main objective of this study was to assess the association between safety climate and employee's injury experience in the past 12 months alongside with other demographic influences. Moreover, this study also investigates the prevalence, types and nature of occupational injuries among Kombolcha Textile workers. As indicated by Yiha (2007) determining the magnitude, nature and types of injuries are primary tasks in designing effective safety initiatives and interventions. By considering this, safety performance in the current study was assessed in terms of workers self-reported injury experience in the past 12 months.

5.1 Occupational Injuries

The finding of this study showed among the 255 participants, 75 (*29 %)* employees reported to have an injury in their work during the last 12 months. This indicated an overall prevalence rate of 294 per 1000 employees in the factory. Nearly a similar prevalence rate of occupational injuries was reported by Senbeto (1991) on a study done at Akaki textile factory. Similarly, another study done on small and large scale industries in Gondar woreda by Tadesse and Kumie (2007), showed, an overall injury prevalence rate of 335 per 1000 workers per year.

With regard to injury types, the current study revealed laceration and abrasion type injuries constitute 45 %, and 21 % of the total injuries respectively. This finding was also consistent with previous findings, as report by Senebto (1991) laceration type injuries was the most common among workers in Akaki textile. As far as the anatomical location of the affected body concerned, fingers and hands were the most frequently affected body part accounted for 46(*60%)* of injuries. A previous study (MOH, 1996) in Addis Ababa among eleven industries

revealed hands; finger, lower leg and eye were most frequently affected body parts. Similar finding was also presented in a study done by (Senbeto, 1991) among Akaki textile workers.

5.2 Employees Demographic Characteristics and Injury

With regard to certain demographic variables, among the total 75 workers reported injury, 59 (*79 %)* were males, whereas the rest 16 (*21 %*) were female workers. The logistic regression analysis of this study also confirmed that, the influence of gender was strong; male employees were 4.2 times more likely to be injured than their counterparts. This finding was in line with most of past studies done in Ethiopia and abroad (Senbeto, 1991; Tadesse & Kumie, 2007). The findings also demonstrated higher percentage of injuries (*69 %)* were observed on workers with the age group of < 34, than those between the age group of 35 -39, (*24%)*. The lower level of injury percentage (6.7 %) was appeared on employees with the age group of 40 +.

Previous studies hold conflicting reports concerning employees' age and occupational injuries. A study done in Tendaho Agro Processing workers by Yiha (2007) reported that young employees (17- 29) reported less injuries than older workers. Likewise, another study by Bhattachersee (1999) on mining industry workers, asserted the absence of significant relationship between employee's age and injury involvement. However, the present finding was consistent with other past studies (Fulle, 1998; MOH, 1996) which pointed less probability of work place injuries among older employees. Employees' age was treated as a continuous variable in the multivariate logistic regression model and it shows for every single year increase in workers age the likelihood of injury involvement decreased by .869 factors other things being equal.

From those who reported an injury in the past 12 months, higher percentage (37 %) of injury was seen among employees who reported to have a secondary education than the others. In most past studies (Rhys & Paul 2005, as cited on Tadesse & Kumie, 2007) increased

education level has been appeared with decreased injury experiences. But the current study showed a non-significant association of the two variables. This can be partly explained that the as most of the participants who reported to have higher level of education were young workers; hence, young age was associated with increased injury experiences.

In the current study, length of service duration was also appeared as a significant factor with regard to the difference in safety performance of employees. Generally, workers who stayed 5 years and above were more prevented from injures than less experienced ones. The result of the logistic regression analysis also confirmed, workers who stayed less than five years in the company were 5.6 times more likely to face injuries than other employees who stayed 6 and above years. This discrepancy might also be partly linked with as employees move from the high hazardous job to less as they get more experienced.

5.3 Safety Climate Perception level and Group differences

Another principal objective of the current study was to assess the prevailing safety climate perception of employees in the organization. A pre-tested safety climate assessment tool which was originally developed by Cox and Cheyne (2000) was used. Scores in this scale can range from a minimum value of 43 and a maximum of 215 and higher scores indicating a greater and positive safety climate. In the current study, the mean score of employees on the SCAT was above the mid-point of the scale. Moreover, inspection of the mean values of each dimensions of the SCAT indicated, workers in the factory had higher mean scores for most of the safety climate dimensions. This implies that workers have positive safety climate perception about the organization.

These being the case, a number subsequent of analyses were performed to uncover possible differences on safety climate perception level of workers on the bases of their demographic

characteristics'. Significant difference was not obtained on the safety climate perception level of workers on the bases of their sex and level of education.

An independent samples t- test was performed to test whether employee's sex could significantly differentiate their safety climate perception level. The result asserted the absence of significant difference in safety climate perception mean scores of males and Females.

The chronological ages of respondents were subjected to be a categorical variable for the analysis of variance purpose. Thus, group one consisted employees with the age of less than 34; group two were comprised of those between 35 -39 and those employees who reported 40 years and above were under group three. The finding demonstrated the presence of a statistically significant difference on the safety climate perception mean scores of employees in accordance with their age.

A post hoc comparison analysis which was done through Dunnett's test also revealed, relatively, safety climate perception level of younger employees showed a statistically significant difference with the other two age groups. However, the findings asserted the absence of a statistically significant mean score difference between those in the group two and group three. Generally, in the current study, increased age was associated with a higher safety climate perception level.

Employees work experience was another demographic factor which appeared as a statistically significant source of difference in the safety climate perception mean scores. Like that of employees' age, their work experiences tend to be higher as they stayed more in the company.

More specifically, the mean score for employees who stayed 1-5 years in the organization was significantly different than those employees who stayed 11-15 years and with those 15 years

and above experience But, there was no significant difference in scores with employees between 6-10 years. The present study also revealed the presence of a statistically significant difference in the mean scores of respondents on the bases of their working unit. Employees under the finishing unit had a higher mean score than those in the spinning which in turn has a better score than those in the weaving.

Concerning differences on the level of safety climate perception based on demographic factors, in many occasions, the findings here were consistent with a past research report Hinze, 1997; Siu et al., 2003; Fang, et al., 2007). For instance, a study by Siu et al. (2003) asserted the influence of workers age in the level safety climate perception. They found that older workers tend to have a more positive safety climate perception than younger ones. Likewise, Choudhry et al. (2009) also reported a more positive safety climate perception among older workers.

5.4 Global Safety Climate perception as a Predictor of Injuries

In the current study, safety climate perception score of workers was entered in the simultaneous logistic regression analysis which was used to model the factors that influence individual's safety performance. The findings asserted employees, who had injured tend to have a lower safety climate mean scores than those not injured. This finding was also consistent with many of those past findings done by researchers in other countries. Neal and Griffin, (2004) asserted employee safety climate perception are positively related with safety behaviors and lowered injury rates in their work environment. Hayes et al., (1998) also suggested occupational injuries among workers can be linked with their total perceived safety at their work setting.

5.5 Safety climate Dimensions

According to Gundulmund (2000) the usefulness of using safety climate surveys lies in supplementing valuable information that can be used as a guide for designing appropriate interventions. Therefore, a Discriminant function analysis was employed to assess the relative importance of the nine dimensions of the SCAT in relation to discriminating the two groups (those injured and not injured employees during the past twelve months). The finding showed, supportive work environment, safety communication and management commitment dimensions of the SCAT were more salient in discriminating employees who injured and not injured with varying degrees.

In this regard, it is interesting to observe the strong magnitude of supportive environment in influencing employees' injury involvement than other organizational level dimensions of the safety climate construct (e.g. management commitment). According to Cox & Cheyne (2000) supportive work environment in the work setting can be viewed as the overall nature of the social work environment at the work setting and the useful supports that can be derived from it. Hence, it is plausible that the degree of support that workers may indulge from their co-workers and supervisors can be associated with their safety performance. This was consistent with a research report by Krause (2008) that dictated the crucial role of co-workers and supervisory support in improving safety within organizations.

Previous studies in the area of safety climate (Cheyne & Cox, 2000; Koys & DeCotiis, 1991) also demonstrated safety communication as a precondition for enhancing employees' awareness and engagement towards work place safety. Generally, to put the findings together, the present study support the view that, how employees act in relation to safety is heavily influenced by what they feel as far as the overall worth and priority given to safety in their work

setting. This is consistent with most safety climate based occupational safety researches (Adutwum,2010;Clarke, 2006; Neal & Garffin, 2004; Srinivassan, 2010) in the past conducted across industries in other countries.

CHAPTER SIX

6. SUMMARY, CONCLUSION AND RECOMENDTIONS

6.1. SUMMARY AND CONCLUSION

Work place injuries have enormous loses not only for the individual victim but also, to the family, society and to the nation at large. As a report by U.S department of labor (2012), indicated occupational injuries are still prevalent in this modern world despite the existence of huge and dramatic technological improvements.

Organizations may take several approaches to improve their safety performances. The traditional safety measures were more reactive (Antonson, 2009; Colla, et al., 2005; Peterson, 1996). In a sense, they were concerned in exploring the engineering and technical cause of injuries and absenteeism as a result of these injuries. However, recently, various studies are identifying human, organizational and managerial factors as causing work related injuries. Therefore, organizations are using proactive and predictive measures of safety performances. Safety climate has been regarded as a proactive method of measure of organizational safety throughout occupational and safety literatures. According to Clark (2006) safety climate is a more proactive and predictive measure of safety than the conventional type lagging indicators of safety. According to Neal and Griffin (2004 , p. 18)) safety climate is "perceptions of procedures and practices relating to safety", which asserted employees perceptions about the value and importance of safety given by their organization.

Reviewing extensive list of literatures in the area of safety climate revealed Zohar (1980) was the pioneer in measuring how employees perceive and gauge matters that have a potential to influence safety in their work setting. As Yule (2003) pointed employees safety climate perception have been playing critical role in accident and injury involvement of workers.

The principal aim of this study was to examine the variation with safety performance of workers by using their demographic factors and safety climate perception as a predictor. To this end, the study posed the following research questions.

1. What are the prevalence, nature, and types of occupation injuries among workers of Kombolcha Textile Factory?
2. What is the prevalent safety climate perception of employees in the factory?
3. Is there a significant difference on the safety climate perception level of employees based on their demographic factors?
4. Does a significant association exist between employee safety climate perceptions alongside with their demographics in predicting the likelihood of an injury that would be reported?
5. To what extent the various dimensions of safety climate when considered independently, explained the variance in safety performance among workers?

To answer these questions, a pre- tested questionnaire was administered on 255 workers in the factory and the result of the study revealed the following findings;

- The prevalence rate of occupational injuries in the factory was 29 % with most laceration and abrasion type injuries occurred mostly on hands and fingers.
- Personal or demographic characteristics' of employees were seen as source of significant differences in safety performance. Among these, the findings asserted, males were more likely to be injured than female workers. Concerning the age of workers, the more a worker gets aged the less an injury to be reported in the past 12 months. Another demographic factor which was manifested as a major source of variation in injury

involvement of workers was their work experience. Employees who stayed six and above years in their current job setting had less probabilities of work related injuries than their counter parts with less than five years.

- Generally speaking, the prevalent safety perception of employees about their organization was good. However, Differences were observed on the bases of their demographic characteristics. A significant difference in the safety climate perception level was seen in terms of respondents' age, length of service duration and working unit. As compared to younger and less experienced workers, older and more experienced employees tend to have a positive safety climate perception of their company. With regard departmental variations, workers in the finishing department gauged their company with a higher safety climate perception values.
- The findings in this study also portrayed safety climate perception of employees in predicting their injury involvement. The higher an individual score on the SCAT, the less likely they report an injury in the past twelve months. This provides safety climate surveys can be used as proactive or leading indicator of organizational safety.
- The study also demonstrated efficient and appropriate safety interventions required careful identification of the safety dimensions that were linked highly with safety performance. This was evident in the current finding that the presence of good safety communication and supportive work environment dimensions of the SCAT were more salient in differentiating employees who injured and not injured.

6.2 RECOMMENDATIONS

In light of the findings of this study, the following recommendations were forwarded for the safety improvement of kombolcha textile factory.

1. The study showed high vulnerability of injuries among males, younger and less experienced workers. Hence, safety practitioners or health and safety committees in the factory shall design specialized safety initiatives and interventions for these groups of employees.
2. Since hands and fingers were most common affected body parts, the factory should consider supplementing personal protective equipment's such as gloves and footing wears that can at least lesser the burden of injuries.
3. With regard to safety climate, the focus of intervention in this case should be in creating conducive flow of safety communication and ensuring the presence of supportive work environment. For instance ,supervisors can improve the good flow of safety communication and the supportiveness of the working environment through the following mechanisms ;
    - Actively listening the concerns of the workers under their responsibility and provide continuous and timely feedback for their safety concerns.
    - Supervisors should tell and make acquainted their subordinates about any potential source of hazards in their working process.
    - They should also play a key role in creating a work environment which is characterized by the presence of good support, sharing of experiences and safety tips among workers under their supervisions.

6.3 Limitations and Recommendations for Future Research Directions

The current study examined safety climate perception of workers that has been regarded as a precursor of much of safety outcomes including accidents and injuries in the work environment. The study was conducted on representative of sample of workers in the organization with a fairly good response rate. To the researcher's knowledge, there are was no local study concerning the association between safety climate perceptions and safety measures like work place injuries in any sector. Hence, this finding can provide base line information.

That being the case, it is also useful to consider that the finding of this study shared some of the drawbacks of correlational study that depend on a data obtained from self-reported questionnaire. Even though, as compared to archival data, self reported injury data are more convenient and easy for researchers to obtain, they are more likely to suffer some errors and bias. As indicated by Landen and Hendricks (1995, cited on Beus, 2009) since self reported approaches required workers to remember certain workplace injuries that happened on the past, there is a high probability of recalling and memory biases. However, other scholars like Schwarz (2007) argued that since work place injuries are rare and more important events, self reports are not that much affected by recalling biases. Instead, Schwarz (2007) asserted self-report injury data may be subject to over-reporting relative to archival injury. Other researchers (Prohaska, Brown, & Belli, 1998) also contended that self report injury data are more likely to suffer a phenomenon called forward telescoping in which workers report an injury which is occurred outside of the time frame for the research survey in hand (e.g outside of the past 12 months). As Arthur et al. (2005, cited on Beus , 2009) pointed the use of archival versus self reported work place injury data yield a different predictor – criterion relationship. Therefore, replicating the

findings of this study with another data collection method or study design would be an important and broad a venue for future researches in the area.

In addition to that, the current study was a cross sectional study design in which all the variables in the study were measured at the same time period. Since work injuries are likewise considered to be predictive of safety climate (Zohar, 2003) one should be very cautious to establish a sequential relationship between the primary independent variable (safety climate) and the outcome (injury presence or not).

Another direction for future studies can be evaluating the predictive ability of safety climate perception of employees along with other prominent psychological variables such as job satisfaction. The last but not the least, based on extensive review of existing safety climate tools, this study employed a pre tested 43 safety climate items devised by Cox and Cheyen (2000). For organizations in our country to benefit from safety climate surveys as a proactive measure of safety, there is a strong need to develop a safety climate perception tools that are valid, highly reliable and pertinent to our cultural setting. This is very paramount in that safety measures from different cultures and industries cannot be fully applied in other settings equally (Dedobbeleer & Beland, 1991).

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Appendix A English version questionnaire

Addis Ababa University

College of education and behavioral studies

School of psychology

English version questionnaire

Questionnaire to assess safety climate and self-reported occupational injuries among workers of kombolcha textile

Questionnaire identification number_____

Introduction and consent form

Hello, my name is Esmael. I come from Addis Ababa University, School of Psychology-Department of health psychology. I would like to forward some questions to you that will assess your perception of the general safety climate condition in your organization. In addition to that this study will also examine the prevalence of injuries among workers in the previous 12 months. The whole process of answering to this questionnaire will take approximately 25 minutes. Your participation to this study is useful to improve occupational safety, health in your factory in particular and in our country in general. I would like to assure you that all the information obtained will be kept confidential. Besides that, your identity will still remain confidential since you are not expected to write your name in any stage of this study.

By signing below, I understood the aim of the study and I am expressing my full agreement to participate in this study ---------- ----------

Signature of Participant date

Part I: Socio- demographic facts

1. Sex A. Male B. Female
2. Age ----------
3. Educational level A. Basic (able to read & write)
   B. Primary school completed (1-8 grades)
   C. Secondary education and above
4. Work experience at the current job
   A. 1- 5 years. C. 11-15 years.
   B. 6-10 years D. 15+ years.
5. Department

A. Spinning B. Weaving C. Finishing

NO	ITEMS	1	2	3	4	5
	Management Commitment					
1	Management acts decisively when a safety concern is raised	1	2	3	4	5
2	Management acts only after accidents have occurred	1	2	3	4	5
3	Corrective actions are always taken when management is told about unsafe practices	1	2	3	4	5
4	In my workplace management acts quickly to correct safety problems	1	2	3	4	5
5	In my workplace management turn a blind eye to safety issues	1	2	3	4	5
6	In my workplace managers/supervisors show interest in my safety	1	2	3	4	5
7	Managers and supervisors express concern if safety procedures are not adhered to	1	2	3	4	5
Communication						
8	Management operates an open door policy on safety issues	1	2	3	4	5
9	My supervisor does not always inform me of current concerns and issues	1	2	3	4	5
10	I do not receive praise for working safely	1	2	3	4	5
11	Safety information is always brought to my attention by my line supervisor	1	2	3	4	5

12	There is good communication here about safety issues which affect me	1	2	3	4	5
Priority of Safety						
13	I believe that safety issues are not assigned a high priority	1	2	3	4	5
14	Management clearly considers the safety of employees of great importance	1	2	3	4	5
15	Safety rules and procedures are carefully followed	1	2	3	4	5
16	Management considers safety to be equally as important as production	1	2	3	4	5
Safety Rules and Procedures			1	2	3	4
17	Sometimes It is necessary to depart from safety requirements for production's sake	1	2	3	4	5
18	Some health and safety rules and procedures are not really practical	1	2	3	4	5
19	Some safety rules and procedures do not need to be followed to get the job done safely	1	2	3	4	5
Supportive Environment						
20	Employees are not encouraged to raise safety concerns	1	2	3	4	5
21	Co-workers often give tips to each other on how to work safely	1	2	3	4	5
22	I am strongly encouraged to report unsafe conditions	1	2	3	4	5
23	When people ignore safety procedures here, I feel it is none of my business	1	2	3	4	5

24	A no-blame approach is used to persuade people acting unsafely that their behavior is inappropriate	1	2	3	4	5
25	I can influence health and safety performance here	1	2	3	4	5
Involvement						
26	I am involved in informing management of important safety issues	1	2	3	4	5
27	I am never involved in the ongoing review of safety	1	2	3	4	5
28	I am involved with safety issues at work	1	2	3	4	5
Personal Priorities and Need for Safety						
29	Safety is the number one priority in my mind when completing a job	1	2	3	4	5
30	Personally I feel that safety issues are not the most important aspect of my job	1	2	3	4	5
31	I understand the safety rules for my job	1	2	3	4	5
32	It is important to me that there is a continuing emphasis on safety	1	2	3	4	5
33	A safe place to work has a lot of personal meaning to me	1	2	3	4	5
Personal Appreciation of Risk						
34	I am rarely worried about being injured on the job	1	2	3	4	5
35	In my workplace the chances of being involved in an accident are quite large	1	2	3	4	5
36	I am sure it is only a matter of time before I am involved in an accident	1	2	3	4	5

37	I am clear about what my responsibilities are for health and safety	1	2	3	4	5
Work Environment						
38	I cannot always get the equipment I need to do the job safely	1	2	3	4	5
39	Operational targets often conflict with safety measures	1	2	3	4	5
40	Sometimes conditions here hinder my ability to work safely	1	2	3	4	5
41	Sometimes I am not given enough time to get the job done safely	1	2	3	4	5
42	There are always enough people available to get the job done safely	1	2	3	4	5
43	This is a safer place to work than other companies I have worked for	1	2	3	4	5

Part III. Injury experience of workers

1. Have you face any injury at your work place in the last 12 month?

   A. YES B. NO

2. If you say yes for Q1 how many times you faced

   A. Once B. Twice D. Three and more three times

3. Which part of your body was affected?

1	Eye	1.YES	2.NO
2	Ear	1.YES	2.NO
3	Hand	1.YES	2.NO
4	Finger	1.YES	2.NO
5	Shoulder	1.YES	2.NO
6	Leg	1.YES	2.NO
7	Tooth	1.YES	2.NO
8	Neck	1.YES	2.NO
9	Back	1.YES	2.NO
10	Knee	1.YES	2.NO
11	Face	1.YES	2.NO
12	Other	1.YES	2.NO

4. What was the type of injury you face?

1	Laceration	1.YES	2.NO
2	Fracture	1.YES	2.NO
3	Amputation	1.YES	2.NO
4	Burn	1.YES	2.NO
5	Abrasions	1.YES	2.NO
6	Cuts	1.YES	2.NO
7	Dislocation	1.YES	2.NO
8	Multiple injuries	1.YES	2.NO

Thank you

Appendix B: Amharic version of the questionnaire

አዲስ አበባ ዩኒቨርሲቲ

የ ሳይኮሎጂ ትምህርት ቤት

የ ሄልዝ ሳይኮሎጂ ትምህርት ክፍል

ይህ መጠይቅ በኮምቦልቻ ጨርቃጨርቅ አ/ማህበር ስር የሚገኙ ሰራተኞች የድርጅቱን አጠቃላይ የሥራ ደህንነት አያያዝ በተመለከተ ያላቸውን አሳቤ እንዲሁም በስራ ገበታቸው ላይ የሚደርሱ አካላዊ ጉዳቶችን ለማጥናት የተዘጋጀ ነው፡፡

የመጠይቅ መለያ ቁጥር_____

የተሳታፊዎችን ፈቃደኝነት መጠየቂያ ቅጽ

እንደምን አሉ፤እኔ_____እባላለሁ፡፡የመጣሁት ከአዲስ አበባ ዩኒቨርሲቲ የሳይኮሎጂ ትምህርት ቤት፣የ ሄልዝ ሳይኮሎጂ ትምህርት ክፍል ነው፡፡ ከዚህ በመቀጠል በዚህ ፋብሪካ ውስጥ ያለውን አጠቃላይ የሥራ ደህንነት አያያዝን በተመለከተ ያለዎትን አመለካከት ለማወቅ የተወሰኑ ጥያቄዎችን ልጠይቅዎት እፈልጋለሁ፡፡በ ተጨማሪም ላለፉት12 ወራት በስራ ገበታዎ ላይ የደረሰን ጉዳት መመርመር የዚህጥናት አላማ ነው፡፡ይህን መጠይቅ ለመመለስ ሊወስድ የሚችለው ጊዜ 25 ደቂቃ ብቻ ነው፡፡ከ እርስዎ የሚገኘው መልስ ለዚህ ድርጅትም ሆነ በ ሀገራችን የሥራ ደህንነት እና ጤና ለማሻሻል እገዛ ይኖረዋል፡፡ከ ሁሉ አስቀድሜ ላረጋግጥልዎ የምፈልገው እርስዎ የሚሰጡኝ መልስ በከፍተኛ ደረጃ ምስጥራዊነቱ የተጠበቀ መሆኑን ነው፣ ከዚህ ጥናት ጋር በተያያዘ ስምዎን መጻፍ ወይም መጥቀስ የሚያስፈልግበት ሁኔታ ስለሌለ እርስዎን የሚያሳስብ አንዳች ነገር የለም፡፡

በጥናቱ ላይ ለመሳተፍ ፍቃደኛ ነዎት?

ሀ/ አዎ ለ/ አይደለሁም

ክፍልአንድ

ማህበራዊ እና ስነህዝባዊ ጥሬ ሀቆች

1. ዖታ ሀ/ ወንድ ለ/ ሴት
2. እድሜ ----------
3. የትምህርት ደረጃ

   ሀ / መሰረታዊ (ማንበብና መጻፍ ብቻ)

   ለ/ የመጀመሪያ ደረጃት/ት ያጠናቀቀ/ች

   ሐ/ የሁለተኛ ደረጃ ት/ት

4. አሁን ባሉበት የስራ ቦታ የቆዩበት ጊዜ

   ሀ/ 1-5 ዓመት ሐ/ ከ 11-15

   ለ/ ከ 6-10 ዓመት መ/ 15 ዓመት በላይ

5. የሥራ ክፍል ሀ/ ፈትል ለ/ ሽመና ሐ/ ማጠናቀቂያ

ክፍል ሁለት

በ ድርጅቱ ያለውን አጠቃላይ የደህንነት ሊያያዝን በተመለከተ

እባክዎ ከቀረቡት አማራጮች የኔን አመለካከት በሚገባ ይግለጻል ያሉት ቁጥር ላይ ያክብቡበት

1= በጭራሽአልስማማም 2= አልስማማም 3= ለመወሰን እቸገራለሁ

4= እስማማለሁ 5= በጣምእስማማለሁ

ተ.ቁ	ጥያቄዎች	1	2	3	4	5
የድርጅቱ የበላይ አስተዳደር ደህንነት ለማስጠበቅ ያለውን ዝግጅነት በተመለከተ						
1	የድርጅቱ አስተዳደር የሰራኞች ደህንነትን የተመለከቱማንኛውም ጉዳዬች ሲቀርቡለት የማያወላውል እና ቁርጠኛእርምጃዎችንይወስዳል፡፡	1	2	3	4	5
2	የድርጅቱ አስተዳደር እርምጃዎችን የሚወሰደው አደጋ ከደረሰ በኃላ ነው፡	1	2	3	4	5
3	የሰራተኞችን ደህንነት አደጋ ላይ የሚጥል ማንኛውም አይነት ችግር ለድርጅቱ አስተዳደር ሲቀርብ ማስተካከያ እርምጃዎች ይወሰዳሉ፡፡	1	2	3	4	5
4	እኔ በምሰራበት ድርጅት ውስጥ አስተዳደሩ በስራ ገበታ ላይ ለሚከሰቱ የደህንነት ችግሮች ፈጣን የማስተካከያ እርምጃዎችን ይወሰዳል፡፡	1	2	3	4	5
5	የድርጅቱ አስተዳደር የሰራተኞች ደህንነት ጉዳዬችን አይቶ እንዳላየ ያልፋል፡፡	1	2	3	4	5
6	የድርጅቱ አስተዳደር የሰራተኞችን የደህንነት ሁኔታ ለማስጠበቅ ፍላጎት አለው፡፡	1	2	3	4	5
7	የድርጅቱ የበላይ አስተዳደር እና የቅርብ አለቆች የሥራ ላይ ደህንነትን ያልተከተሉ አሰራሮችን ሲያስተውሉ ለማስተካከልጣልቃይገባሉ፡፡	1	2	3	4	5
ደህንነትን በተመለከተ ያለውን የመረጃ ልውውጥ መስተጋብር በተመለከተ						
8	የሰራተኞች ደህንነት የተመለከቱ ማናቸውም አይነት ጉዳዬች ለማስተናገድ የድርጅቱ አስተዳደር በሩ ክፍት ነው፡፡	1	2	3	4	5
9	የቅርብ አለቃየ የእኔን ወቅታዊ ጉዳዬችን የተመለከቱ መረጃዎችን አይሰጡኝም፡፡	1	2	3	4	5
10	በስራ ገበታየ ላይ ለደህንነት ቅድሚያ ሰጥቼ ብሰራ ምንም አይነት ማበረታቻ አላገኝም፡፡	1	2	3	4	5

11	የቅርብ አለቃየ ለ ደህንነቴ ቅድሚያ ትኩረት ሰጥቴ እንድሰራ የሚረዱ የ ደህንነት መረጃዎችን ይነግረኛል	1	2	3	4	5
12	በስራ ገበታየ ላይ ለኔ ደህንነት አስጊ የሆኑ ጉዳዬችን በተመለከተ ግልጽ እና ጥሩ የመረጃ ልውውጥ አለ	1	2	3	4	5
ለደህንነት የተሰጠው ቅድመ ግምት						
13	በዚህ ድርጅት ውስጥ የሰራተኞች ደህንነት ጉዳይ ትልቅ ቅድሚያ ተሰጥቶታል ብየ አላምንም፡፡	1	2	3	4	5
14	የዚህ ድርጅት አስተዳደር ለ ሰራተኞች ደህንነት ከምንም በላይ የላቀ ቦታ ይሰጣል፡፡	1	2	3	4	5
15	ድርጅቱ የሥራ ላይ ደህንነትን የተመለከቱ የአሰራር መመሪያዎች በሚገባ መተግበራቸውን ይከታተላል፡፡	1	2	3	4	5
16	የድርጅቱ አስተዳደር ለምርት የሚያስበውን ያህል በእኩል ደረጃ ለሰራተኞች ደህንትም ይጨነቃል፡፡	1	2	3	4	5
የስራ ቦታን ደህንነት ማስጠበቂያ መመሪያዎችን በተመለከተ						
17	አንዳንድ ጊዜ የሚፈለገውን የምርት መጠን ለማሳካት ሲባል ከደህንነት መመሪያዎች ውጭ መስራት ይጠበቅብናል፡፡	1	2	3	4	5
18	አንዳንድ የስራ ላይ ደህንነት እና ጤናን ለማስጠበቅ የወጡ መመሪያዎችና የአሰራር ቅደም ተከተሎች አይተገበሩም፡፡	1	2	3	4	5
19	ደህንነቴን ጠብቄ ስራዬን ለመስራት አንዳንድ የስራ ላይ የደህንነት መመሪያዎችን ተከትየ መስራት አያስፈልገኝም	1	2	3	4	5
ምቹ የስራ ሁኔታን በተመለከተ						
20	ሰራተኞች ያሉባቸውን የደህንነት ችግሮች እንዲያቀርቡ አይበረታቱም፡፡	1	2	3	4	5
21	እኔና የሥራ ባልደረቦቼ ደህንነታችንን በጠበቀ መልኩ ስራችንን ማከናወን እንድንችል ጠቃሚ ሀሳቦችን እና ምክሮችን እንለዋወጣለን፡፡	1	2	3	4	5
22	ለ ደህን አስጊ የሆኑ ሁኔታዎች ሲያጋጥሙኝ ለሚመለከተው አካል ማሳወቅ እንዳለብኝ ድርጅቱ ያበረታታል፡፡	1	2	3	4	5

23	በሥራ ገበታቸው ላይ ደህንነታቸውን ጠብቀው የማይሰሩ ሰራተኞች ሲያጋጥሙኝ ምንቸገረኝ በሚል በቸልታ አልፈዋለሁ፡፡	1	2	3	4	5
24	በስራ ገበታቸው ላይ የራሳቸውን ደህንነት አደጋ ላይ የሚጥል የስራ ላይ ባህሪ የሚያሳዩ ሰራተኞችን ከድርጊታቸው እንዲታቀቡ አይወቀሱም፡፡	1	2	3	4	5
25	በስራ ገበታ የላይ ያለውን የደህንነት ሁኔታ ለማሻሻል የራሴ የሆነ ሚና አለኝ፡	1	2	3	4	5
ሰራተኞችን ደህንነታቸውን ለመሰጠበቅ ተሳትፎ በተመለከተ						
26	ወሳኝ የሆኑ የስራ ላይ ደህንነት ጉዳዬችን ለአስተዳደሩ በማሳወቅ ረገድ የራሴን አስተዋጽኦ አደርጋለሁ፡፡	1	2	3	4	5
27	በየጊዜው በሚካሄዱ የደህንነት ምርመራዎች ላይ በጭራሽ አልሳተፍም፡፡	1	2	3	4	5
28	የስራ ላይ ደህንነትን በሚመለከቱ ጉዳዬች እሳተፋለሁ፡፡	1	2	3	4	5
ሰራተኞች ለደህንነት የሰጡትን ግምት በተመለከተ						
29	ስራየን በምሰራበት ጊዜ ከምንም በፊት ለደህንነቴ ቅድሚያ ሰጥቼ ነው፡፡	1	2	3	4	5
30	የደህንነት ጉዳይ በስራ የላይ ያን ያህል ትልቅ ቦታ የምሰጠው አይደለም፡፡	1	2	3	4	5
31	ደህንነቴን ጠብቄ ስራየን እንድሰራ የሚረዱ የደህንነት መመሪያዎችን አውቃለሁ፡፡	1	2	3	4	5
32	ድርጅቱ ለደህነንት ቀጣይነት ያለው ትኩረት ቢሰጥ ተጠቃሚ ነኝ፡፡	1	2	3	4	5
33	ምቹ እና ደህንነቱ የተጠበቀ የሥራ ቦታ ላይ መስራት ለእኔ የተለየ ትርጉም አለው፡፡	1	2	3	4	5
ሰራተኞች በስራ ላይ ሊደርሱ ስለሚችሉ አደጋዎች ያላቸውን ስሜት በተመለከተ						
34	በስራ ገበታየ ላይ ጉዳት ይደርስብኛል ብየ ብዙም አልጨነቅም፡፡	1	2	3	4	5
35	በስራ ገበታየ ላይ ለአደጋ የመጋለጥ ከፍተኛ እድል አለኝ	1	2	3	4	5
36	የጊዜ ጉዳይ ነው እንጂ በዚህ ስራ ላይ እስካለሁ ድረስ አንድቀን እንደምጎዳ እርግጠኛ ነኝ፡፡	1	2	3	4	5
37	የሥራ ላይ ደህንነት እና ጤናን በተመለከተ የኔሀላፊነት ምን እንደሆነ በግልጽ አውቃለሁ	1	2	3	4	5
አጠቃላይ የሥራ ቦታ ሁኔታን በተመለከተ						
38	ደህንነቴን በጠበቀ መልኩ ስራየን እንዳከናውን የሚያግዙ የአደጋ መከላከለያ (ጓንት፣ቦቲ ጫማ፣ማስክ) አላገኝም፡፡	1	2	3	4	5

39	ድርጅቱ ምርታማነት ለማሳደግ የሚከተለው አካሄድ ከስራ ደህንነት መለኪያዎች ጋር ይጋጫል	1	2	3	4	5
40	አንዳንድ ጊዜ ደህንነቴን ጠብቄ እንዳልሰራ ሁኔታዎች ይገድቡኛል፡፡	1	2	3	4	5
41	አንዳንድ ጊዜ ደህንነቴ በተጠበቀ መልኩ ስራዎችን ለመስራት የሚያስችል በቂ ጊዜ አይሰጠኝም፡፡	1	2	3	4	5
42	የሰራተኛውን ደህንነት በጠበቀ መልኩ ለመስራት የሚያስችል በቂ የሰው ሀይል አለ፡፡	1	2	3	4	5
43	ይህ ድርጅት በስራ ላይ ደህንነት ረገድ ከሰራሁባቸው ሌሎች ድርጅቶች የተሻለ ነው፡፡	1	2	3	4	5

ክፍል ሶስት፡- የሰራተኞች የሥራ ላይ ጉዳትን በተመለከተ

1. ባለፉት 12 ወራት በስራ ገበታህ/ሽ ላይ የደረሰ አካላዊ ጉዳት ነበር?

   ሀ/ አዎ ለ/ የለም

2. ከላይ ለ ጥያቄ 1 መልስዎ አዎ ከሆነ ስንት ጊዜ ነበር ጉዳት ያጋጠመዎት?

   ሀ/ አንድ ጊዜ ለ/ ሁለት ጊዜ ሐ/ ሶስት ከዚያ በላይ

3. የትኛው የሰውነት ክፍልህ/ሽ ነበር ጉዳት ያጋጠመው

1	አይን	1. አዎ	2. የለም
2	ጆሮ	1. አዎ	2. የለም
3	እጅ	1. አዎ	2. የለም
4	ጣቶች	1. አዎ	2. የለም
5	ትከሻ ላይ	1. አዎ	2. የለም
6	ቅንጭላት አካባቢ	1. አዎ	2. የለም
7	እግር	1. አዎ	2. የለም
8	ጥርስ	1. አዎ	2. የለም
9	አንገት	1. አዎ	2. የለም
10	የጀርባ አካባቢ	1. አዎ	2. የለም
11	ጉልበት	1. አዎ	2. የለም
12	ፊት ላይ	1. አዎ	2. የለም
13	ሌላ		

4 . ምን አይነት ጉዳት ነበር ያጋጠመህ/ሽ

1	የመቁሰል	1.	አዎ	2.	የለም
2	የመሰበር	1.	አዎ	2.	የለም
3	የአካል መጉደል	1.	አዎ	2.	የለም
4	በእሳት የመቃጠል	1.	አዎ	2.	የለም
5	ጭረት (የመላጥ)	1.	አዎ	2.	የለም
6	መቆረጥ	1.	አዎ	2.	የለም
7	ወለምታ	1.	አዎ	2.	የለም
8	ከአንድ በላይ ጉዳት አይነት				

Appendix C

Calculating dimension scores

Dimension	**Add**	**Divide by**	**Score**
Management commitment	item 1 + (6 - Item 2) +(6 - Item 5)Item 3 + em 4 + item 5+ item 6	7	
Safety communication	item 8 + Item 9 + (6 – Item 10) + (6- Item item 11) + item 12	5	
Priority of Safety	**(6-** Item 13) + Item 14 +Item 15+ item 16	4	
Safety Rules and Procedures	(6 - Item 17) + (6 - Item 18) + (6 -Item 19	3	
Supportive Environment	(6 - Item 20) +Item 21 + Item 22 + (6 - Item 23) + Item 24+item 25	6	
Involvement	Item 26 + Item 27 + (6 – item 28)	3	
Personal Priorities and Need for Safety	Item 29 +(6 -Item 30) +Item 31 + Item 32+ + Item 33	5	
Personal Appreciation of Risk	Item 34)+ (6-Item 35 + (6 – item 36)+ Item 37	4	
Physical Work Environment	(6 – Item 38) +(6- Item 39) + (6 – Item 40)+ (6 - Item 41) + Item 42 + Item 43	6	

Appendix D

Post hoc comparison table for age variance by using Dunnett's C

(I) Age (Binned)	(J) Age (Binned)	Mean Difference (I-J)	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
<= 34	35 – 39	-21.642*	4.455	-32.28	-11.01
	40+	-31.560*	3.840	-40.71	-22.41
35 – 39	<= 34	21.642*	4.455	11.01	32.28
	40+	-9.918	4.353	-20.32	.49
40+	<= 34	31.560*	3.840	22.41	40.71
	35 – 39	9.918	4.353	-.49	20.32

**. The mean difference is significant at the 0.05 level.*

Appendix E

Post hoc multiple comparison of variance in safety climate base on work experience

(I) Work experience	(J) Work experience	Mean Difference (I-J)	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1-5 years	6-10 years	-5.036	4.629	-17.18	7.10
	11-15 years	-5.422	6.057	-21.52	10.68
	>15 years	-21.040*	4.767	-33.69	-8.39
6-10 years	1-5 years	5.036*	4.629	-7.10	17.18
	11-15 years	-.387	6.057	-16.47	15.69
	>15 years	-16.005	4.768	-28.63	-3.38
11-15 years	1-5 years	5.422*	6.057	-10.68	21.52
	6-10 years	.387	6.057	-15.69	16.47
	>15 years	-15.618	6.164	-32.09	.85
>15 years	1-5 years	21.040*	4.767	8.39	33.69
	6-10 years	16.005*	4.768	3.38	28.63
	11-15 years	15.618	6.164	-.85	32.09

*. *The mean difference is significant at the 0.05 level.*

Appendix F

Dunnett's Post hoc multiple comparisons on the variation on the safety climate level based on working departments

(I) Working department	(J) Working department	Mean Difference (I-J)	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Spinning	Weaving	10.535*	4.402	.05	21.02
	Finishing	-.502	4.775	-11.94	10.94
Weaving	Spinning	-10.535*	4.402	-21.02	-.05
	Finishing	-11.036*	5.307	-23.75	1.68
Finishing	Spinning	.502	4.775	-10.94	11.94
	Weaving	11.036*	5.307	-1.68	23.75

**. The mean difference is significant at the 0.05 level.*