

UNIVERSITY OF GONDAR
INSTITUTE OF PUBLIC HEALTH
COLLEGE OF MEDICINE AND HEALTH SCIENCE
DEPARTMENT OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY



Level of safety culture and associated factors in X Construction
Company, Ethiopia.

By: Engidawork Kibneh

Advisors: 1. Haimanot G/Hiwot (MSc)
2. Yifokire Tefera (MSc)

A THESIS SUBMITTED TO THE INSTITUTE OF PUBLIC HEALTH,
UNIVERSITY OF GONDAR IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC
HEALTH IN OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT.

June, 2014
Gondar, Ethiopia

UNIVERSITY OF GONDAR
COLLEGE OF MEDICINE AND HEALTH SCIENCES
INSTITUTE OF PUBLIC HEALTH
DEPARTMENT OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY



Level of safety culture and associated factors in X Construction Company, Ethiopia.

By: Engidawork Kibneh (BSc.)

Approved by the Examining Board

Head, Institute of public Health

Advisors:

1. Haimanot G/Hiwot (MSc)

2. Yifokire Tefera (MSc)

□ Examiner

Acknowledgment

I want to express my deepest gratitude to my advisors Mr. Haimanot G/hiwot and Mr. Yifokire Tefera for their constructive comments and unreserved advices. They made me feel more confident and hard working than ever before. I would like also to acknowledge University of Gondar, School of public health for partial funding of the study.

I also extend my gratitude to Pete Kines, at the National Research Centre for the Working Environment in Copenhagen, for all help with NOSACQ-50 Questionnaire and for his unreserved advice. I want also to thank my friends for their constructive comments.

Last but absolutely not least, I would like to thank X construction company management for their permission to do this thesis in the company and everyone at the company who have participated in the survey.

Acronyms

ANOVA-----	Analysis of variance
CI-----	Confidence interval
HSE-----	Health and Safety Executive
ILO-----	International labor organization
INSAG-----	International Nuclear Safety Advisory Group
K.S.A-----	Kingdom of Saudi Arabia
MOLSA-----	Minister of Labor and social affairs
NOSACQ-----	Nordic Safety Climate Questionnaire
OSH-----	Occupational health and Safety
SPSS-----	Statistical Package for Social science
U.K -----	United Kingdom
U.S.A-----	United States of America

Table of content

Acknowledgment	iii
Acronyms.....	iv
Table of content.....	v
List of tables	vii
List of figures.....	viii
Abstract.....	ix
1. Introduction.....	1
1.1. Statement of the problem.....	1
1.2. Literature review	4
1.2.1. Dimensions of safety culture	5
1.2.2. Level of safety culture.....	8
1.2.3. Factors associated with safety culture	11
1.2.4. Conceptual framework.....	13
1.2.5. Justification of the study.....	14
2. Objectives.....	15
General objective	15
Specific objectives.....	15
3. Methods	16
3.1. Study design.....	16
3.2. Study area	16
3.3. Source population.....	16
3.4. Study population.....	16
3.5. Inclusion criteria: All employees who were actively working in the X construction company during data collection period were included.....	16
3.6. Exclusion criteria: Those workers who were seriously ill during data collection and all answers for a dimension was excluded from the calculation if less than 50% of the items in that dimension were answered.	16
3.7. Sample size determination.....	17
3.8. Sampling Technique and sampling procedure	17
3.9. Variables of the study	19
3.10. Operational definitions.....	20
3.11. Data collection tools and procedures.....	21

3.12.	Data quality control	22
3.13.	Data processing and analysis	23
3.14.	Ethical consideration.....	24
4.	Results	25
4.1.	Socio- demographic characteristics of respondents	25
4.2.	Behavioral/individual life style characteristics.....	27
4.3.	Level of safety culture.....	28
5.	Discussion	30
6.	Conclusion.....	35
7.	Recommendation.....	36
8.	Reference	37
9.	Annex	40
9.1.	Annex I: English version questionnaire.....	40
9.2.	Annex 2 Amharic version Questionnaire	49

List of tables

Table 1.Distribution of socio-demographic characteristics of respondents in X construction company, April 2014 (n=400)	25
Table 2.Distribution of behavioural characteristics among respondents in X construction company, April 2014(n=400)	27
Table 3. The variation in the level of safety culture among X Construction Company sites, April 2014.....	28
Table 4.factors associated with level of safety culture of X Construction Company, April 2014. (Bivariate and Multivariate analysis) (n=400).....	29

List of figures

Figure 1. Conceptual Framework on level of Safety Culture and associated factors in X Construction Company, Ethiopia, 2014 (developed from literature review).....	13
Figure 2. Schematic presentation of sampling procedure on level of safety culture and associated factors in X Construction Company, Ethiopia, 2014.....	18
Figure 3. Type of occupations who were included in the study of level of safety culture in X construction company, 2014 (n=400).	26

Abstract

Introduction: Construction industry has a unique nature and considered as a dangerous industry. Due to its characteristics, the promotion of safety management and maintaining safe work environment is difficult and inadequate. Cost of injury and accident incurred is higher in developing country like Ethiopia. Promoting and maintaining safety culture is a new way of decreasing workplace accidents and creating conducive environment in construction sector.

Objective: to assess the level of safety culture and factors associated with it in X Construction Company, Ethiopia, 2014.

Methods: An Institutional based cross-sectional study was conducted. The sample size of the study was 422 in X construction workers with a response rate of 95%. The data was collected by using interview administered NOSACQ-50 questionnaire and review of records of accident report, OHS company documents and walk through survey using workplace observation checklist to support the Questionnaire. The score of mean above 2.5 was considered as good safety culture and below the mean as poor safety culture; as well the level of safety culture of the company was indicated using mean score. Both Bivariate and multivariate logistic regression analysis were used to determine the degree of association by using odds ratio with 95% CI. ANOVA was also used to calculate the mean differences of X construction company sites.

Results: The level of safety culture of X construction company was (56.8%) with mean score of 2.8. Educational status [AOR: 2.70, 95% CI :(1.02-7.18)], work experience [AOR: 2.58, 95% CI :(1.63-4.09)], job satisfaction [AOR: 1.79, 95% CI :(1.40-2.82)] were significant factors associated with level of safety culture.

Conclusion and recommendation: The level of safety culture of the company was good and at the calculative level. Educational status, work experience and job satisfaction had positively associated with the level of safety culture. Improving level of safety culture of the company; promoting and strength safety culture through establishing OSH management system; Health and safety training and education, discouraging work resign, and good labor relationship.

Key words: level of safety culture, questionnaire, NOSACQ-50, checklist, factors.

1. Introduction

1.1. Statement of the problem

The concept of safety culture was first introduced by the International Nuclear Safety advisory Group (INSAG) in Chernobyl accident report in 1986. After that safety culture has been started in the investigations of other major accidents that were occurred in different parts of the world(1, 2). Safety culture is currently a growing concept applied by many business sectors especially in high risk jobs to minimize the occurrence of accident with a co-operative effort of the workers and management.

Construction industry is characterized by its diverse and involves different labor force; subcontractors, managers, engineers, unskilled labor and various other professionals who are working in high risk (3).Researches have witnessed that workers in construction have higher risk of death and accidents compared to other professionals (4).It is a very complex, fragmented, intensive and peripatetic workforce, and continuous exposure to bad weather. Due to these characteristics, the promotion of safety management and maintain safe work environment is inadequate to improve safety performance in the construction industry (5-7).Generally, the occupational health and safety service provision in construction industry especially in developing countries is very poor(4, 8).

Worldwide the sector involved and generated a big economy in each country and recruited a large number of workforces as total. If we take the growing economy of Ethiopia, construction is the core element of GTP. It accounted for the 5.8% GDP and showed a fast growth of 8.2% and consumed 60% of the national capital budget. The gross value of construction works output of Ethiopia in 2008/09 was reported as more than 17.3 billion birr(9). However, the Ministry of Construction and Urban Development reported that the sector is characterized by lack of good governance, lack of design study, lack of construction administration regulatory system, and lack of quality monitoring and evaluation mechanism. There is no prior health and safety preparation for projects, lack of policy and regulatory system, OSH practiced in a traditional way

hence unable to protect workers and public around construction sites which resulted simple injury to death. There is lack of safety training for workers, poor scaffolding, lack of providing safety devices, lack to aware workers about hazardous materials in construction. Generally, the productivity of workforce in construction is not satisfactory(10).

Many studies found highest rate of accidents, deaths and injuries in different parts of the world. In Hong Kong, the fatality rate across all other industries is 8.6 but in the construction industry is 64.2. In Canada, it is 6.1 in all industries but in the construction industry accounts 20.9. The fatality rates are higher in the construction industry than in all other industries in Australia, Sweden and United Kingdom. In Sri Lanka, one out of six accidents and 25 out of 40 deaths occur at construction sites due to negligence or carelessness. This condition is worse in the developing countries, like Ethiopia where reliable data are not available(11, 12). Most of the studies chased the accident and its outcome like injury and death. However few studies were available which assess the level of safety culture and those factors affecting the level of its existence. Basically it is the predisposing factor for the occurrence of accident in any setting.

The poor health and safety performance observed in South Africa construction was attributed by the lack of management commitment, inadequate supervision and inadequate or a lack of H&S training, lack of worker involvement, personal risk appreciation and work pressures(13). A study in Nigerian construction showed that structures for managing H&S on site are discovered to be the best correlate of H&S performance(3). Incentives like safety bonuses increase task performance but lead to underreporting of injuries (4). Other studies also reported that poor enforcement of safety, unsafe methods, unsafe site conditions, poor attitude towards safety, and unsafe behaviors as the main causes of construction accidents (14, 15)

So far efforts have been carried out towards engineering control, administrative and using personal protective equipment to reduce fatalities and accident in construction. Now, it is time to look into a new philosophy to develop safe practice and maintain safer

work environments. Building a safety culture is a better way to overcome unsafe behaviors and unsafe conditions, the major causes of fatalities and accidents in construction and other industries.

Therefore, aiming to create safe working environment, reduce costs, developing and maintaining safety culture in construction industry is becoming vital. Hence, this study was designed to assess the level of safety culture in Construction and to describe those factors which affect safety culture.

1.2. Literature review

The concept of safety culture was not introduced into the mainstream until 1986 with the International Atomic Energy Agency's investigation into the Chernobyl accident. Since then, many safety researchers and practitioners have turned to the concept. There is still considerable debate about safety culture with no clear consensus yet on its definition and scope; the theoretical issues underpinning it; its relationship to safety climate and to other organizational factors and characteristics; and how best to measure it (16, 17).

The idea of safety culture has organizational nature and it is assumed that its origin was the concept of organizational culture. The concept of organizational culture was developed during the 1970s even though the ideas already existed. Organizational culture is commonly used to describe corporate shared values which influence employees' attitude and behavior. As a subset of organizational culture, safety culture is deemed to be the degree of observable efforts of all members who improve safety awareness and activities in daily life, which can affect employees' attitude and behavior to consolidate health development and safety performance of organization (1, 18,19).

Globally, the construction industry has a poor safety record. It remains one of the most dangerous industries in which to work. Economic development activities are usually hampered in a country with high rate of construction fatalities; since productivity will be low, inflation and rate of unemployment will be high while there will be an increase in social vices. Since fatalities originate from unsafe acts of people, they can be prevented through the inculcation of a positive safety culture in the construction industry(20).

In United Kingdom (U.K), it was reported that in 2011-2012, the construction industry had 49 fatal injuries accounts 28% of fatal injuries of the industry sections. In the United States of America (U.S.A), fatal injuries in the private construction sector were 721 cases in 2011, which made construction to be in the second position of the most fatal industry of all sectors. In the Kingdom of Saudi Arabia (K.S.A), the construction industry

had 48% of all occupational injuries in 2011 and 29% of construction injuries were due to falling, while 32% were due to struck by a falling object(21, 22).

The major causes of accidents in construction sectors are related to the unique nature of the industry, human behavior, difficult work site conditions, and poor safety management, which result in unsafe work methods, equipment and procedures. A study conducted in Libya showed that lack of safety culture is the most important reasons in causing accidents(23).

1.2.1. Dimensions of safety culture

There are significant variation in safety culture measuring questionnaire content, style, statistical analysis, sample size, factors or dimensions of safety culture and sample composition. Still, there are no common dimensions to measure safety culture in the construction industry (24, 25). The quantitative research of safety culture and safety climate was begun in a study called "Safety climate in industrial organizations: Theoretical and applied implications." This study explored an eight-factor structure with a 40-item questionnaire given to production workers in 20 Israeli companies. Health and Safety Executive (HSE) climate survey tool identified ten safety climate factors including organizational commitment and communication, line management commitment, supervisor's role, personal role, work mates' influence, competence, risk taking behavior and contributory influences, obstacles to safe behavior, permit to work, and reporting of accidents and near misses (7, 25).

A research model developed in Australia was used to examine and assess relationships between the determinants and the safety climate in construction site environments, and seek a correlation between the safety climate and workers' safe behavior. The ten Underlying constructs were management commitment, communication, rules and procedures, supportive and supervisory environments, workers' involvement, personal appreciation of risk, appraisal of work environment, work pressure, and competence(26).

The Nordic Safety Climate Questionnaire (NOSACQ-50) was developed by a team of Nordic occupational safety researchers based on organizational and safety climate theory, psychological theory, previous empirical research, empirical results acquired through international studies, and a continuous development process. Initial versions of the instrument were tested for validity and reliability in four separate Nordic studies using native language versions in each respective Nordic country. NOSACQ-50 was found to be a reliable instrument for predicting safety motivation, perceived safety level, and self-rated safety behavior. The validity of NOSACQ-50 was further confirmed by its ability to distinguish between organizational units through detecting significant differences in safety climate. NOSACQ- 50 consists of 50 items across seven dimensions, i.e. shared perceptions of: 1) management safety priority and ability; 2) management safety empowerment; and 3) management safety justice; as well as shared perceptions of 4) workers' safety commitment; 5) workers' safety priority and risk non-acceptance; 6) safety communication, learning, and trust in co-workers' safety competence; and 7) workers' trust in the efficacy of safety systems (27).

Management safety priority and ability

Management's role has to go beyond organizing and providing safety policies and working instructions. If managers are perceived to be committed to safety and to prioritize safety in relation to other goals, safe behavior would be expected to be rewarded, and thereby reinforced (26, 27). Competence is related to the organization's safety management systems; whether they get in the right experience data, the quality of data, how the organization acts upon it in the form of feedback, training and development of other safety measures (2, 26).

Leadership has a central role to play in creating and sustaining a sound safety culture in a growing economy. Leadership has the primary responsibility for fostering, cultural change and for sustaining a sound safety culture once it is established(28). Leadership styles have both direct and indirect effects on safety culture. The direct effects relate to managers' and supervisors' modeling of safe and unsafe behaviors, and to their reinforcement of subordinates' behavior through monitoring and control. The indirect effects of leadership styles relate to the establishment of norms relating to practices and

procedures, thus creating a particular safety culture or climate(29). Transactional leaders have Behaviors of the following characteristic regard safety such as Monitoring and reinforcing workers' safe behaviors, Becoming involved in safety initiatives, Participating in workforce safety activities, Ensuring compliance with regulatory, Requirements Providing resources for a comprehensive safety program and Transformational leaders behaviors regard safety are: Being supportive of safety Initiatives, Encouraging employee involvement in safety initiatives ,Emphasizing safety over productivity ,Adopting a decentralized style, Demonstrating visible and consistent commitment to safety, Showing concern for people, Encouraging participatory styles in middle managers and supervisors and Giving time for safety(29, 30).

Management safety empowerment

One way for managers to convey trust is by empowering the employees. Empowerment is a delegation of power, and as such it demonstrates that managers trust workers' ability and judgment, and that managers value workers' contributions. Empowerment would further strengthen social exchanges, and in conditions where safety is highly valued by the organization (27).

Management safety justice

Blame may be a barrier to learning. Accountability and blame are predominant features of the work situation; safety tends to be excessively managed through formal procedures, as a means of self-preservation, resulting in a compliance culture, increasingly prescriptive and inflexible (27, 31).

Workers' safety commitment

A study suggested that individuals feel more committed to the workgroup than to the organization, and hence that the work group is most powerful in the socialization of new members. Norms of risk acceptance may play a negative role in relation to safety priority, and have been claimed to counteract active safety work (27, 32).

Workers' safety priority and risk non-acceptance

A highly committed organization also makes available sufficient resources, such as time, equipment and people. These three Cs, commitment, competence and cognizance, may be referred to as cornerstones in safety culture (17).

Safety communication, learning, and trust in co-workers' safety competence

Communication is not merely an exchange of information, but also a prerequisite for learning and for new, innovative ideas to emerge. Communication should, to be effective, take place not only as an interaction between management and employees but also between employees (27).

Workers' trust in the efficacy of safety systems

Measure of perceptions of safety systems should not be an audit on how such systems are implemented in the workplace but rather aim at capturing perceptions of the efficacy for attaining a high standard of safety of a systematic approach to safety through well developed safety management systems (27, 33).

1.2.2. Level of safety culture

Many organization are not succeeded in attaining positive level of safety culture despite they do have their own level of safety culture, poor or good working at one level. A study identified types of organization culture based on how organization processes information and this are Pathological, Bureaucratic and Generative (28, 34).

Three stages of maturity of safety culture proposed by international atomic energy agency (IAEA). Stage one of this study shows that an organization sees safety as external requirements and management as an aspect of conduct that will allow it to succeed. An organization at stage 2 considers safety to be an important organizational goal, even in the absence of external requirements. At stage 3 an organization has adopted the idea of continuous improvement and applied the concept to safety. Another study developed safety culture maturity model helping organizations identify the level of maturity of their safety culture and has five levels of maturity such as emerging, managing, involving, cooperating and continually. Safety culture maturity model and stages of maturity model were developed as a diagnostic tool but they lack empirical evidence to support them (34).

Afterward, another study by Hudson identified five level of safety culture were explained as follow: - Pathological level of safety culture: where nobody cares to understand why accidents happen and how they can be prevented and Organizations with a pathological culture are ruled by a desire to preserve status quo; they deny signals, punish whistle blowers and avoid reporting. Reactive level of safety culture: is a level in which a lot of attention is given to safety, but only after an accident has happened. Calculative level of safety culture: the organization plays it with the rules and downplays signals. The workforce in this kinds of organizations are of the opinion that everything is in place and that it is possible to tick off boxes to show that everything is done according to the books. Organizations with a calculative safety culture ignores wider system feedback and confines to deviation control and have systems in place to manage safety, but just to satisfy rules, regulations and authority. Proactive level of safety culture: everything is in place but that the organization is still looking for areas to make improvements. Generative level of safety culture: safety is totally integrated in the business and therefore a part of everything being done. Organizations with a generative safety culture are learning organizations with a higher order feedback system (28, 34).

A study conducted in Brazil in 23 petrochemical companies developed framework for measuring safety culture maturity based on the model of Hudson. A questionnaire was designed to measure five aspects of organizational safety indicative of five levels of cultural maturity. The five dimensions were information, organizational learning, and involvement, communication and commitment. The result of this study indicated that the 23 companies studied showed characteristics of different levels of safety culture maturity and most scores were at the level of proactive (34). The dimensions of this study were similar with the contents and issues raised by NOSACQ-50 dimensions with minor differences.

NOSACQ-50 was developed by a Nordic network of occupational safety researchers and it is currently available in over 25 languages, and results from around the world are currently being collected in an international database in order to allow for benchmarking and further development. The questionnaire consists of 50 items across seven

dimensions. Dimension 1 for Management safety priority consists of nine items; dimension 2 for Management for safety empowerment has seven items; dimension 3 for Management safety justice has six items; dimension 4 for Workers' safety commitment has six items; dimension 5 for Workers' safety priority & risk non acceptance has seven items, dimension 6 for Peer safety communication learning & trust in safety ability has eight items and dimension 7 for Workers trust in safety systems has seven items within it. During this study was carried on the NOSACQ -50 international database had a grand mean score of 3.03 and with mean of dimension 1(2.94),dimension 2(2.88), dimension 3 (2.99),dimension 4(3.15),dimension 5 (2.93),dimension 6 (3.11) and dimension 7 (3.20) respectively (35).

Based on the current data in the international NOSACQ-50 database a rule of thumb for interpreting the results of each dimension was prepared. A score of more than 3.30 indicates a good level allowing for maintaining and continuing developments .A score of 3.00 to 3.30 points to a fairly good level with slight need of improvement .A score of 2.70 to 2.99 shows a fairly low level with need of improvement .A score below 2.70 indicates a low level with great need of improvement. A Masters student has proposed a link between these NOSACQ-50 score categories and Hudson's (2003) levels of safety culture - ranging from the pathological (less than 2.4), reactive (2.4-2.69) and calculative (2.7-2.99) levels to the proactive (3.0-3.30) and generative (greater than 3.30) levels(35).

A study done in Sweden using NOSACQ-50 Questionnaire tool to evaluation the safety climate in the global paint and coating company showed that a mean score of 3.32 for workers. Mean scores for each dimension in this study was 3.13, 3.22, 3.35, 3.44, 3.09, 3.48, and 3.53 for dimension 1(Management safety priority), dimension 2 (Management safety empowerment), dimension 3 (Management safety justice), dimension 4 (Workers' safety commitment), dimension 5 (Workers' safety priority & risk non acceptance), dimension 6 (Peer safety communication learning & trust in safety ability) and dimension 7(Workers trust in safety systems) respectively (1).

Another study done in Ghana used the same instrument (NOSACQ-50) to evaluate the level of safety culture. the results of this study was a score of grand mean of 3.20 and with each dimension score of 3.21, 2.95, 3.42, 3.40, 3.24, 3.39 and 2.80 for dimension 1, dimension 2, dimension 3, dimension 4 ,dimension 5,dimension 6 and dimension 7 respectively (30).

1.2.3. Factors associated with safety culture

A few studies tried to see the effects of socioeconomic, demographic and behavioral factors of workers independently on safety culture assessment but any of them did not consider these three factors at same time at their studies.

A study carried out in Hong Kong construction workers showed that older workers exhibited more positive attitudes to safety .Another study in the same country stated that the employees, who are older, married, or with more family members to support have more positive perceptions of the safety climate than those employees who were younger, single, or with less family members to support. People tend to work more safely and have a better perception of their work environment as well as better safety attitudes and beliefs as social responsibilities increased (6, 36).

Studies done in china showed that Employees with education levels below primary school have far less positive perceptions of the safety culture than others. An education level of primary school or higher are more targets of safety training than others. Increase in the frequency and strength of safety training and safety promotion also play an effective role in improving employees' safety attitudes (6, 7).

The primary concern with regard to drinking at work is that the mental condition of a worker may be altered. An altered mental stage generally results in impaired judgment, which may increase the chance of an injury, whether to the drinker or to fellow workers. An employee with a bad habit of drinking alcohol at work tends to neglect the safety of self as well as fellow workers. This increases the chances of developing other bad work habits. The same study found that smoking did not have influence on safety climate (6)

Similar study indicated that Employees of subcontractors or joint ventures generally have a less positive safety climate than direct employees of the company. It indicates that the extensive use of subcontracting on sites may lead to problems of lack of control on site and lower levels of worker commitment (6).

A study explored the relationship between safety climate and personal characteristics such as age, marital status, dependent family members, education level, safety knowledge, drinking habits, direct or indirect employer, and breaking safety procedures or not, was significantly related to safety climate perceptions. With the same study other variables, including gender, work experience with the company, work experience in the construction industry, whether injured or not, and smoking habits were found to have no influence on perceptions of safety climate (6, 24).

A study in Sweden showed that the level of safety climate significantly varies with age, tenure in the current position, if the employee had worked outside the company, the employee had heard the term safety culture before, and the employee knew what about safety culture (1).

A study having a good safety culture in an organization can bring several benefits such as avoiding injuries which reduces downtime and eventually leads to the generation of substantial cost savings and also builds a good reputation for itself as well as creating job satisfaction for employees (30, 37).

1.2.4. Conceptual framework

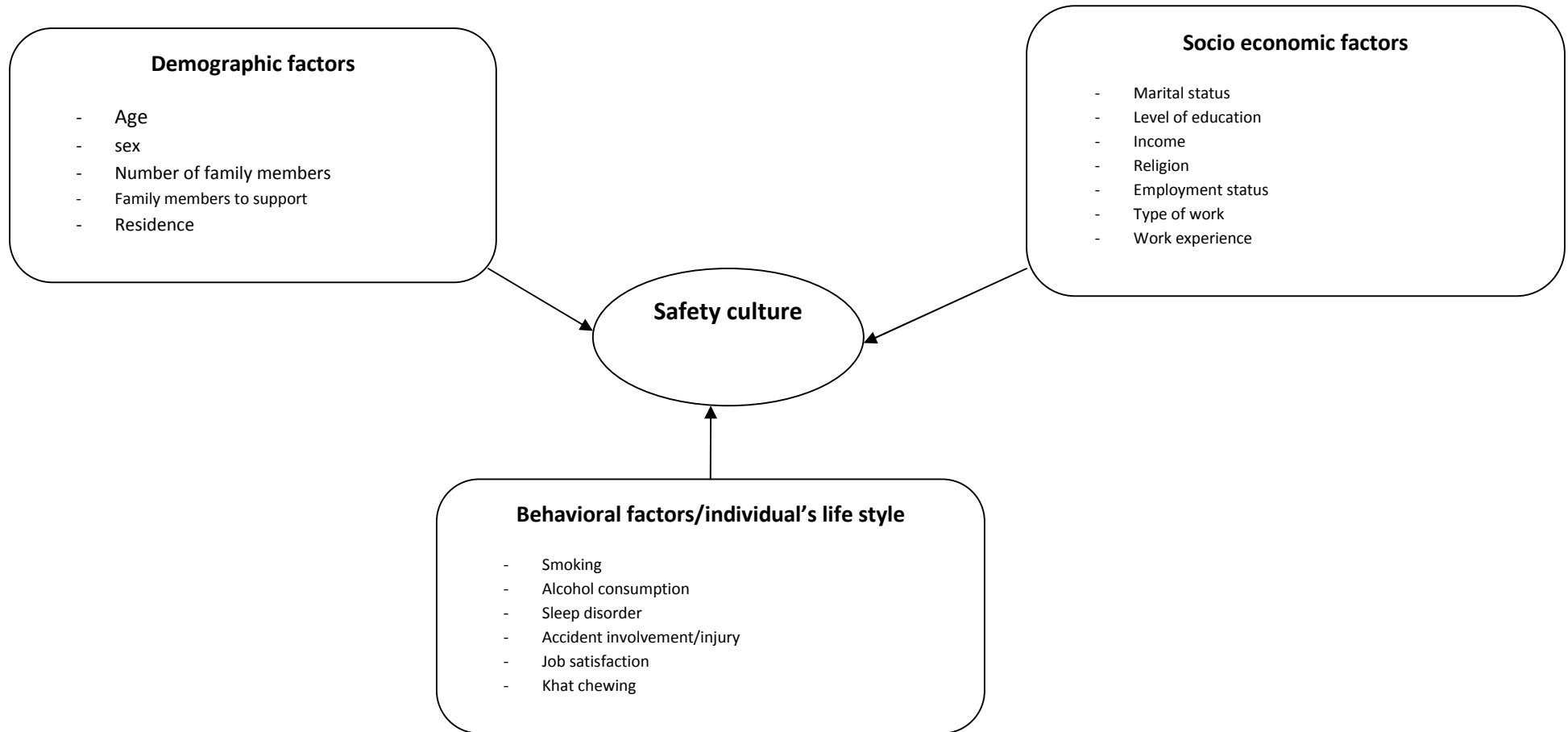


Figure 1. Conceptual Framework on level of Safety Culture and associated factors in X Construction Company, Ethiopia, 2014 (developed from literature review)

1.2.5. Justification of the study

ILO fundamental pillars of global OSH strategy include the building and maintenance of a national preventative safety and health culture and the introduction of a systems approach to OSH management (38).

Safety culture is ILO Global Strategy on Occupational Safety and Health to create a safe and healthy working environment and improving OSH performance in the long term. It is proactive measure of safety performance through evaluation of the status and progress of the organizations. Yet, no study had been published for Ethiopia to assess safety culture in construction as well as in other industries. Therefore, this study will contribute for achieving ILO global strategy on occupational safety and Health and improving OSH performance in the country particularly in construction industry and used as baseline for further studies.

Due to the nature of construction work, high mobility of workforce and decentralization studying level of safety culture in construction industry is not an easy task but carrying out the present study with the existing challenges in the sector will enable the government to evaluate existing strategic policy and to look for new way of creating safer work environment and also make possible improvements for the company and sector to easily develop and sustain the safety culture.

Therefore, the result of this study would help construction companies to enable them on addressing their occupational health and safety strategies to include safety culture as a core value.

2. Objectives

General objective

To assess the level of safety culture and factors associated with it in X construction company, Ethiopia

Specific objectives

- To evaluate the level of safety culture in one construction company at four project sites and Head office
- To identify factors associated with level of safety culture

3. Methods

3.1. Study design

An Institutional-based cross-sectional study was conducted to evaluate the level of safety culture and associated factors in 'X' named Construction Company during the period of March to April 2014.

3.2. Study area

The study was conducted in X Construction Company where four active project sites and Head office were present throughout the country during data collection period. The X Construction Company is one of the most known construction companies undertaking various construction projects for longer years in different parts of Ethiopia. The company head office and all active sites have their own Health and safety officer. Now, the company is registered as a Class I Building Contractor. (The company is named as X Company for its confidentiality).

3.3. Source population

All workers in the X construction company were considered as source population

3.4. Study population

The required study sample population from four project sites and head office of X Construction Company was drawn according to the proposed sampling procedure from which the required information was collected.

3.5. Inclusion criteria: All employees who were actively working in the X construction company during data collection period were included.

3.6. Exclusion criteria: Those workers who were seriously ill during data collection and all answers for a dimension was excluded from the calculation if less than 50% of the items in that dimension were answered.

3.7. Sample size determination

In this study, sample size was determined using single population proportion formula. Taking proportion of safety culture 50 % since there was no previous study done on safety culture within the country and across the country in similar settings and the maximum sample size at 95 % certainty and a maximum discrepancy of 5% between the sample and the underlying population. The formula to determine the sample size was shown below.

$$n = \frac{(z / 2)^2 p (1-p)}{d^2}$$
$$n = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.05)^2} = 384$$

For possible none response during the survey the final sample size was increase by 10% to $n = 384 + 10\%$ which is $= 422$

3.8. Sampling Technique and sampling procedure

The study population was disturbed in to four project sites of X Construction Company at different strata. During this study the company had four active project sites which were distributed through out the country. In addition to this project sites, head office workers were part of the study. The number of sample points was determined by using proportion allocation formula for each stratum. Then, the required sample size was selected by using simple random sampling technique from each stratum.

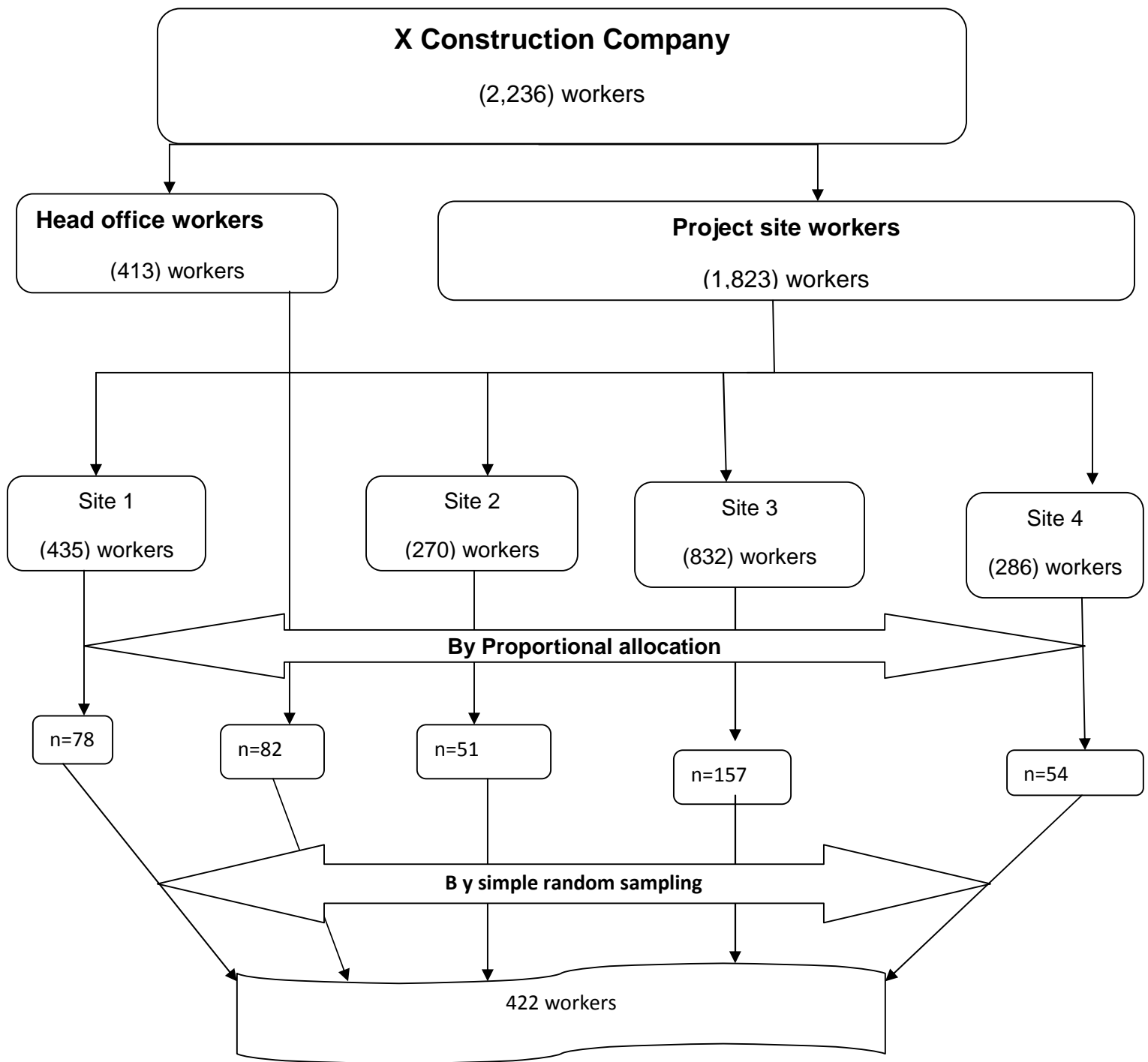


Figure 2. Schematic presentation of sampling procedure on assessment of level of safety culture and associated factors in X Construction Company, Ethiopia, 2014.

3.9. Variables of the study

Dependant variable

- Level of safety culture

Independent variables

- **Socio economic factors:** Marital status, Level of education, monthly salary, Religion, Employment status, Type of work, work experience.
- **Demographic factors:** Age, sex, Number of family members, Family members to support, Residence.
- **Behavioral factors/individual's life style:** Smoking, Alcohol consumption, Sleep disorder, Khat chewing, Accident involvement/injury, Job satisfaction.

3.10. Operational definitions

- **Level of safety culture:** it's measured by the weighted workers response on the NOSACQ-50 questionnaire in Likert scale and the aggregated mean score of 2.5 was considered a cut of point, those who have a value above the mean score had level of safety culture.
- **Pathological level of safety culture:** a score of mean for NOSACQ-50 Questionnaire < 2.4 and indicates very low (poor) level with great need of improvements.
- **Reactive level of safety culture:** a score of mean for NOSACQ-50 Questionnaire ranging 2.4 – 2.69 and indicates low (poor) level with great improvements.
- **Calculative level of safety culture:** a score of mean for NOSACQ-50 Questionnaire ranging 2.70 - 2.99 and indicates good level with slight need of improvements.
- **Proactive level of safety culture:** a score of mean for NOSACQ-50 Questionnaire ranging 3.00 – 3.30 and shows very good level with slight need of improvements.
- **Generative level of safety culture:** a score of mean for NOSACQ-50 Questionnaire greater than > 3.30 and shows excellent level allowing for maintaining and continuing improvements.
- **Injury:** Any physical injury condition sustained on worker in connection with the performance of his/ her work but not includes work related diseases that need exposure assessment or laboratory tests and doctoral examination.
- **Job satisfaction:** whether the worker was happy with the job that he/she had engaged currently or not.
- **Sleeping Disorder.** The presence of sleeping problems when the worker is at work in the factory.
- **Smoking:** Currently smoking regardless of the number of cigarettes smoked per day.

3.11. Data collection tools and procedures

Data was collected using structured interviewer administered questionnaire having three parts, the first part containing socio-economic factors, Demographic factors and Behavioral/individual life style Questions.

The second and third part of the questionnaire was a Nordic Safety Climate Questionnaire (NOSACQ-50). It was developed by a team of Nordic occupational safety researchers based on organizational and safety climate theory, psychological theory, previous empirical research, empirical results acquired through international studies, and a continuous development process. For the sake of this study, it was translated in to Amharic version (local language).

Nordic safety climate Questionnaire (NOSACQ -50) was a standardized questionnaire having 50 questions with 22 evaluating management level and 28 evaluating workgroup level conditions across seven dimensions 1) management safety priority, commitment and competence 2) management safety empowerment 3) management safety justice 4) workers' safety commitment 5) workers' safety priority and risk non-acceptance 6) safety communication, learning, and trust in co-workers' safety competence; and 7) workers' trust in the efficacy of safety systems. It is a diagnostic and intervention tool to evaluate the status and progress of safety culture/climate in an organization (35).

In this study the Nordic Safety Climate Questionnaire (NOSACQ-50) was used to determine the level of safety culture of the company and project sites. The items can be divided into two groups depending on if they are positively or reversed (negatively) formulated items. There were 21 reversed (negatively) formulated Questions out of fifty (50) NOSACQ-50 Questions. Responses recorded on a Likert scale of strongly disagree = 1, disagree = 2, agree = 3 and strongly agree = 4 for positively formulated items and strongly disagree = 4, disagree = 3, agree = 2 and strongly agree = 1 for reversed Questions. A mean score was calculated for the company and for each project sites. The mean was also calculated for each of seven dimensions and participants. The Nordic Questionnaire (NOSACQ-50) Uses a four point Likert scale, score ranges from 1-4 and

a mean score for this is 2.5 i.e. $1+2+3+4=10/4=2.5$, so the result above the mean (2.5) was considered as a good level of safety culture and below the mean considered as a poor result (31).

The merit of this tool is that the first and the second sample were administered in the construction industry in all five Nordic countries. So, it is similar in study subjects with the current study. The questionnaire also tested in a sample of workers in the Swedish food processing industry. The tool was confirmed for reliability and validity and it has international data base for comparing result with other countries (35).

Review of records of accident report, OHS company documents and walk through survey using workplace observation checklist were also done to support the finding of the Questionnaire by principal investigator.

One supervisor and 5 data collectors was employed and trained for one days about the Questionnaire contents, procedure, and time of data collection, timely collection and reorganization of the collected data. The data was collected by five health and safety officers for respective projects sites.

3.12. Data quality control

The quality of data was assured by using standard questionnaire, properly designed and pre-testing 5% of the questionnaire in one of the construction company other than the selected industry, and through training of data collectors and supervisors before the actual data collection.

Throughout the course of the data collection, interviewers was supervised at each site, regular meetings held between the data collectors and the principal investigator together in which problematic issues arising from interviews which was conducted and mistakes found during editing was discussed and decisions was reached. The collected data was reviewed and checked for completeness before data entry; and 20 questionnaires were found incomplete or inaccurate and registered as non response. For controlling errors during data analysis, 10% of the questionnaires were double entered into the software and also frequency checks were done.

3.13. Data processing and analysis

All the questionnaires were checked visually coded and entered to SPSS version 20 Software for analysis. Data entry was made by the principal investigator. The second section of the Questionnaire (NOSACQ -50 Questionnaire) used for evaluation of safety culture had two components depending on if they are positively or reversed (negatively) formulated items. The mixture of positive and reversed items enables the detection of acquiescence bias which is the tendency to respond in an indiscriminately positive way.

The raw data from the items were used to calculate mean scores for each dimension and individual. Only answered items were used in the calculations. All answers for a dimension were excluded from the calculation if less than 50% of the items in that dimension were answered. The reason for this is that a mean score based on less than 50% of the items cannot be considered reliable. The mean scores for each dimension and individual were then used to calculate mean scores for each dimension and group (35).

Descriptive and analytical statistics including Bivariate and multivariate analysis was employed. The results are presented in the form of tables, figures and text using frequencies and summary statistics such as mean, standard deviation and percentage to describe the study population in relation to relevant variables. ANOVA also was used to calculate the mean differences of X construction company sites and Head office.

Bivariate analysis was used to examine association between dependent and independent variables. All variables with $p < 0.2$ in Bivariate analysis were inserted in to the multiple logistic regression model to identify factors associated with level of safety culture. The following factors were included in the final model after selection of variables by backward stepwise method: age, religion, education, work experience, Habit of cigarette smoking, job satisfaction, sleep disorder and family member support. Significance was obtained at Odds ratio with 95% CI and $p < 0.05$.

3.14. **Ethical consideration**

Ethical clearance was obtained from Ethical review committee of university of Gondar and in order to obtain permission letter I made contact X Construction company management. The selected site managers from each project was informed about the purpose of the study, then study subjects was selected and importance of the study was informed and withdraw at any time and written consent was obtained prior to data collection. Privacy and confidentiality of information given by each respondent was kept properly and names were not recorded.

4. Results

4.1. Socio- demographic characteristics of respondents

A total of 422 workers were participated in this study with the response rate of 95%.The mean (\pm SD) age of the participants was 31.92 ± 7.95 . Three hundred sixteen (79%) of workers were males. The majority of study population 312(78 %) have educational level of grade 9 and above. Regarding employment pattern, 268(67%) was permanently employed. Three hundred sixty two (90.5%) of the study participants earned less than 5000 ETB including overtime payment per month. Two hundred twenty four (56%) of respondents support less than three family members. One hundred sixty four (41%) of respondents experienced injury in the last 12 months in the company.

Table 1. Distribution of socio-demographic characteristics of respondents in X construction company, April 2014 (n=400)

Variables	Number (n)	Percent (%)
Sex		
Male	316	79
Female	84	21
Age		
18 – 30	221	55.25
31 – 40	126	31.5
41 – 60	53	13.25
Religion		
Orthodox	288	72
Muslim	60	15
Protestant	47	11.7
Catholic	5	1.3
Educational Status		
Read and write	22	5.5
Primary school(1-8)	66	16.5
Secondary school(9-12)	115	28.75
Technical /vocational	83	20.75
First degree and above	114	28.5
Marital status		
Single	191	47.75
Married	199	49.75
Divorced/Widowed	10	2.5
Employment Type		
Daily laborer	55	13.75
Contract	77	19.25
Permanent	268	67
Monthly income		
1500	55	13.75
1,500 – 5,000	307	76.75

5,000 -9,999	31	7.75
10,000	7	1.75
Working experience		
<3 years	239	59.75
3 – 10 years	152	38.0
>10years	9	2.25
Residence		
Urban	364	91
Rural	36	9
Number of family numbers		
2	150	37.5
3-4	204	51.0
5-6	46	11.5
Family member supported		
None	13	3.3
2	211	52.8
3-6	176	44.0

Majority of participants in the study were engineers 73(18.3%).Others 45(11.25%) category include different administrative workers who had directly or indirectly working in the construction site.

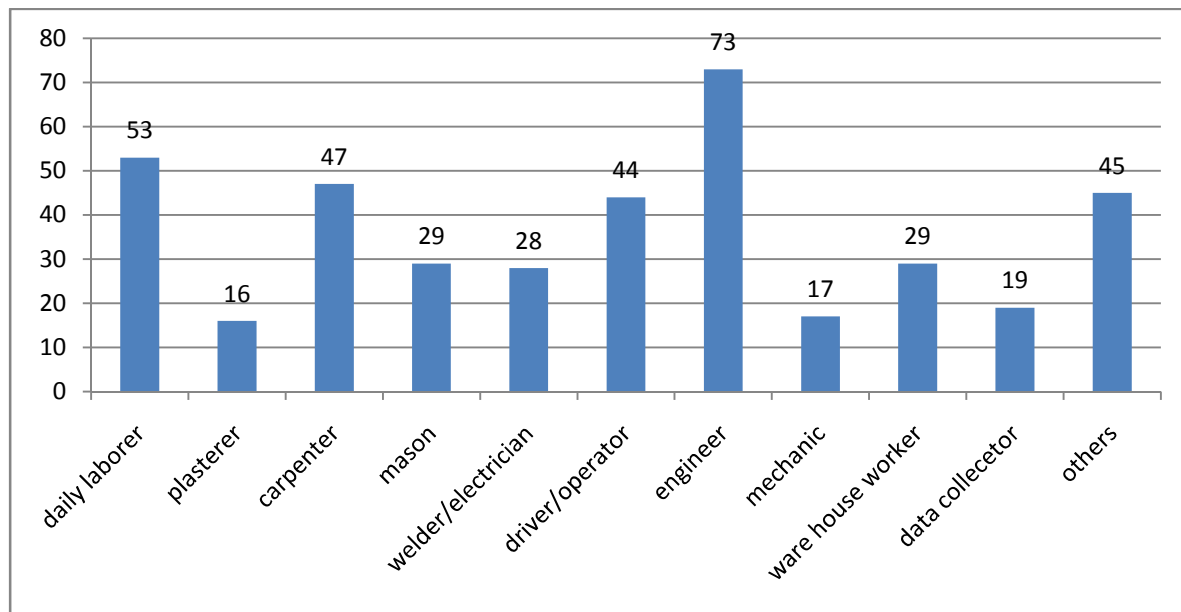


Figure 3.Type of occupations who were included in the study of level of safety culture in X construction company, 2014 (n=400).

4.2. Behavioral/individual life style characteristics

The result showed that twenty seven (6.8%), twenty four (6%), two hundred thirty nine (59.7%) of participants were used to smoke cigarette, chew chat and drink alcohol respectively. Majority of the respondents 369(92.3%) were relatively happy with their current job. The reasons for job satisfaction were over all employment relationship, salary and other benefits, relation with boss, occupational health and safety facilities which account 11.5%, 6%, 42.5%, 17.8% and 15.3% respectively. 164 (41%) Worker had experienced injury in last 12 months. One hundred fifty one (38.5%) workers hear the word safety culture (Table 2).

Table 2. Distribution of behavioural characteristics among respondents in X construction company, April 2014(n=400)

Variables	Number (n)	Percent (%)
Cigarette smoking		
Yes	27	6.75
No	373	93.25
Khat chewing		
Yes	24	6
No	376	94
Drinking alcohol		
Yes	239	59.7
No	161	40.3
Job satisfaction		
Not at all	31	7.7
Yes to some degree	221	55.3
Yes to utmost level	148	37.0
Sleeping disorder		
Yes	184	46
No	216	54
Injury		
Yes	164	41
No	236	59
Heard about safety culture		
Yes	154	38.5
No	246	61.5

4.3. Level of safety culture

According to workers rating the overall level of safety culture in x construction have a mean score of 2.81 hence, 56.8% workers had a value above the mean score (NOSACQ-50). The mean score of level of safety culture of each sites; head office, site 1, site 2, site 3 and site 4 was 2.72, 2.77, 2.79, 2.85 and 2.87 respectively. The lowest mean score was obtained in dimension 4 (2.58) for project site two and the highest mean score was obtained in dimension 6 for project site 4 (3.05) (Table 3).

Table 3. The variation in the level of safety culture among X Construction Company sites, April 2014.

Site name	N	Dim 1	Dim 2	Dim 3	Dim 4	Dim 5	Dim 6	Dim 7	Subsafety culture
Head office	78	2.682	2.689	2.771	2.618	2.775	2.766	2.72	2.72
Site 1	74	2.752	2.770	2.739	2.687	2.776	2.922	2.72	2.77
Site 2	47	2.853	2.769	2.840	2.582	2.799	2.872	2.82	2.79
Site 3	151	2.854	2.960	2.942	2.650	2.824	2.915	2.82	2.85
Site 4	50	2.796	2.917	2.890	2.730	2.869	3.050	2.84	2.87
Total	400	2.787	2.821	2.836	2.653	2.809	2.905	2.78	2.8
P value		0.048	0.000	0.061	0.278	0.002	0.005	0.225	

Dim =Dimension, n= sample size of each site and head office Dim 1= Management safety priority and ability, Dim 2= Management safety empowerment, Dim 3= Management safety justice, Dim 4= Workers' safety commitment, Dim 5= Workers' safety priority and risk non-acceptance), Dim 6= Peer safety communication learning and trust in safety ability, Dim 7= Workers' trust in efficiency of safety systems

6.4. Factors for level of safety culture

Bivariate analysis showed that, independent variables: age, religion, education, work experience in the company, job satisfaction and family member support were found to be significant association with level of safety culture. However, only education, work experience and job satisfaction were statistically significant with level of safety culture at multivariate logistic regression. Those individuals who had been in secondary school (9-12) were higher level of safety culture (AOR=2.701 95% CI (1.016, 7.179)) compared to individuals who only read and write. Those who had longer work experience (3 – 10

years) 2.58 times more likely to have safety culture than had work experience (<3 years).The likelihood of having safety culture among those who had satisfied with their job at some degree was nearly 80% higher (AOR= 1.792 95% CI (1.40, 2.82)) compared to who had not satisfied with their job (Table 4).

Table 4.factors associated with level of safety culture of X Construction Company, April 2014. (Bivariate and Multivariate analysis) (n=400).

Category of variables	Safety culture		COR(95%CI)	AOR(95%CI)
	Yes n(%)	No n(%)		
Age*				
18-30	110(49.8)	111(50.2)	1.00	
31- 40	76(60.3)	50(39.7)	1.534(0.980,2.390)	
41-60	41(77.4)	12(22.6)	3.45(1.720,6.910)	
Religion*				
Orthodox	151(52.4)	137(47.6)	0.735(0.121,4.46)	
Muslim	39(65.0)	21(35.0)	1.24(0.191,8.003)	
Protestant	34(72.3)	13(27.7)	1.74(0.261,11.657)	
Catholic	3(60.0)	2(40.0)	1.00	
Educational Status*				
Read and write	10(45.5)	12(54.5)	1.00	1.00
Primary school (1-8)	37(56.1)	29(43.9)	1.531(0.580,4.038)	
Secondary school (9-12)	80(69.6)	35(30.4)	2.743(1.084,6.941)	2.70(1.02,7.18)*
Technical /vocational	42(50.6)	41(49.4)	1.229(0.479,3.157)	
First degree and above	58(50.9)	56(49.1)	1.243(0.497,3.106)	
Working experience**				
<3 years	118(49.4)	121(50.6)	1.00	1.00
3 – 10 years	102(67.1)	50(32.9)	0.279(0.057,1.369)	2.58(1.63,4.09)**
>10 years	7(77.8)	2(22.2)	0.583(0.117,2.909)	
Habit of Cigarette smoking[@]				
Yes	19(70.4)	8(29.6)	1.884(0.804,4.412)	
No	208(55.8)	165(44.2)	1.00	
Job satisfaction*				
Not at all	74(50)	74(50.0)	1.00	1.00
Yes to some degree	138(62.4)	83(37.6)	1.663(1.090,2.535)	1.79(1.40,2.82)*
Yes to utmost level	15(48.4)	16(51.6)	0.938(0.432,2.034)	
Sleeping disorder[@]				
Yes	96(52.2)	88(47.8)	0.708(0.476,1.054)	
No	131(60.6)	85(39.4)	1.00	
Family member supported*				
None	4(30.8)	9(69.2)	1.00	
2	112(53.1)	99(46.9)	2.54(0.760,8.523)	
3-6	111(63.1)	65(36.9)	3.842(1.138,12.925)	

Note 1.00= reference, @=variable whose p-value <0.2 in the Bivariate, * =P-Value <0.05, ** = P-Value 0.001.

5. Discussion

In this study the level of safety culture of X Construction Company was 2.8 with workers rating and 56.8% of workers scored more than 2.5 mean of NOSACQ-50 .The level of safety culture of head office and four sites were 2.72, 2.77, 2.79, 2.85 and 2.87 respectively. The seven dimensions which made safety culture of the company; dimension 1(Management safety priority and ability), dimension 2(Management safety empowerment), dimension 3(Management safety justice), dimension 4(Workers' safety commitment), dimension 5 (Workers' safety priority and risk non-acceptance), dimension 6 (Peer safety communication learning and trust in safety ability) and dimension 7 (Workers' trust in efficiency of safety systems) scored a mean of 2.787,2.821,2.836,2.653,2.809,2.905 and 2.783 respectively. This result showed that there was a significant difference in the level of safety culture among the sites of the company in dimension 1($p=0.048$), dimension 2($p=0.000$), dimension 5($p=0.002$) and dimension 6($p=0.005$) where site three and site four have a slightly higher level of safety culture. This difference could be appeared due to difference in management safety priority and ability among site managements; variation in empowering workers about safety; workers difference in safety priority and risk non acceptance and inconsistency in peer safety communication learning and trust differences among employees who were working in four sites and Head office.

The mean difference among workers of current study (2.8) was lower than the international NOSACQ-50 database (3.03) which was prepared for international comparison for interested organizations to evaluate their safety culture using the same instrument (NOSACQ-50 Questionnaire). All mean scores of each dimensions of international database (dim 1=2.94, dim2=2.88, dim3=2.99, dim4=3.15, dim 5=2.93, dim 6=3.11, dim 7=3.20) were also higher than each dimensions of this study. This might be due to the current international database was not based on a representative sample from all countries. Only those companies in developed world interested in being measured provide data, many of which have a very (pro) active health & safety management systems (35). Therefore, generally the international data base may not

exactly reflect the condition in developing countries like Ethiopia where poor health and safety practice with lack of policy frame work and weak regulatory system(10).

It was also lower than the mean score of a study conducted in Sweden using the same instrument found a mean score of 3.32(1). Still lower that a study done in Ghana which was 3.20 (30).The difference in mean score with the Sweden study could be due a better safety practice in the stated country and also subjects were enrolled for the study from paint and coating chemical manufacturing company . Hence there was an obvious variation in subjects' educational and other profile in the two study settings.

The difference in mean score with the Ghana study could be due to better management concern about safety and transformational behaviors of leaders. The same study showed that Transformational Leadership styles correlated with better safety culture(30). Workers ability to risk non acceptance and safety priority in the mentioned country and also subjects were selected from mining industry could be also reason for the difference.

The result of this study showed that the company was at the calculative level (2.70 – 2.99) of safety culture. An organization with calculative level of safety culture has characteristics of Environment of command and control by management; statistics but no follow up; information goes top down, failures bottom up; procedures exist but are only once read; Workforce is more involved, little effect on procedures, designs and practices; Clean and tidy working environment; Management cares but not always knows; ignores wider system feedback and confines to deviation control(28, 34). These characteristics were seen in the present company during review of records of accident report, OHS company documents and walk through survey using workplace observation checklist. Hence, the mean score result and the characteristic seen during walk through survey confirmed that the company has calculative level of safety culture. A study done in Brazil in 23 oil and gas companies showed different level of safety culture and most of the companies were at the level of proactive(34). This difference could be due the

companies in the mention country had better OSH practice and systematic way of managing health and safety.

Secondary level of education was positively associated with level of safety culture. This finding was in line with study conducted in Hong Kong. The study showed that illiteracy is a consistent risk factor for poor safety culture. Employees with education levels below primary school have far less positive perceptions of the safety culture than secondary level of education. The relationship with no formal education could be explained by a having no formal education lead to less likely to understand safety rules and procedures and to act in safe manner and job insecurity (6).

Working for long years in the same industry was positively associated with the level of safety culture. Employees with longer year of service (3 – 10 years) in the construction company were 2.58 times more likely to have better safety culture than employees had short (<3 years) year of experience. A study in Hong Kong, working for longer years did not show association. A rational for the relationship with longer experience could be explained that the longer a person works in the company, the better he/she internalizing safe system, work instructions, getting of health and safety trainings and adapting the working atmosphere (6).

Workers who had satisfied with their job at some degree were positively associated (AOR=1.79 95% CI (1.40, 2.82)) with level of safety culture. One hundred sixty nine (42.3%) and 71 (17.8%) of respondents were reported that their reasons for happiness with their job were healthy relation between management and workers and maintaining Occupational safety and health standards and relatively safe work place respectively. A study showed that safety culture builds a good reputation for itself as well as creating job satisfaction for employees(30, 37). Another study in Australia showed that there was a positive significant relation between safety culture and supportive environment. As the study explained that supportive environment seems to be perceived as having relatively more importance than the supervisory environment and this was not very surprising, as

a construction worker who continually interacts with coworkers also relies on them to a greater extent to provide a safer work environment (26).

Even though, Bivariate and multivariate logistic regression showed that there was no significant association between safety knowledge and safety culture. The descriptive part of the study indicate that more than half (61.5%) of the respondents did not know about the concept “safety culture”. A Study in Hong Kong showed that there was positive association between safety culture and safety knowledge. The difference with Hong Kong study could be explained that the instrument used to evaluate level of safety culture was different and the two study settings were quite different in terms of workers educational and other profile (6).

At last, the level of safety culture was lower than the international database as well as the studied done in Sweden and Ghana. There was a significant difference among sites in dimension 1, dimension 2, dimension 5 and dimension 6 where site 3 and 4 had slightly better level of safety culture than other sites. This difference could be due variation in sites Management safety priority and ability; Management safety empowerment; Workers’ safety priority and risk non-acceptance and Peer safety communication learning and trust in safety ability. The result of this study showed that Education, work experience and job satisfaction were factors associated with level of safety culture and they are crucial for building good level of safety culture.

3. LIMITATION OF THE STUDY

Lack of similar studies done in our country limits comparison.

6. Conclusion

The level of safety culture among workers in X Construction Company found a mean score of 2.8 which was lower than the expected international database, and more than 56.8% of the respondents were above the mean score value. Generally, the company categorized in the Calculative level of safety culture which has a value of 2.70-2.99 which needs improvement to reach on the next levels; Proactive level of safety culture and Generative level of safety culture.

Moreover, education, work experience and job satisfaction were associated with the level of safety culture.

7. Recommendation

For X construction company

- The company needs to improve the level of safety culture to next level (to proactive level of safety culture and then generative level of safety culture through increasing safety information and trust among workers and managements and devote time for health and safety issues for correcting deviate action, talk about safety issues in management meetings and considering safety in project planning stage.
- Promoting and strengthen safety culture through developing occupational health and safety system.
- The company needs to encourage workers to stay longer in the organization through improving labor relationship, creating safe working environment and safety incentives.
- The organization should educate, train and orient about health and safety issues early in the morning before work or after work.

For X construction Workers

- Workers should prioritize safety and not accepting risk through following safe procedures, rules and avoiding unsafe acts.
- Workers need to increase safety knowledge through peer safety communication and learning.

To MOLSA

- Promote safety culture through motivating and providing technical support for establishing occupational Health and safety management system in Construction Company.

To researchers:

- Further studies including many companies and applying qualitative methods.

8. Reference

1. Bergh M. An evaluation of the safety climate at AkzoNobel Site Stenungsund .Master of Science Thesis. Göteborg, Sweden.2011.
2. Wiegmann D, Zhang H, von Thaden T, Sharma A, Mitchell A. Safety culture: a concept in chaos? To appear in the Proceedings of the 46th Annual Meeting of the Human Factors and Ergonomics Society. Santa Monica, Human Factors and Ergonomics Society. 2002.
3. Idoro GI. Health and safety management efforts as correlates of performance in the Nigerian construction industry. *Journal of Civil Engineering and Management*. 2008;14(4).
4. Spangenberg S. An injury risk model for large construction project. *Palgrave Macmillan Risk manag (Bas)*. 2009;11(2):111-34.
5. Bakri A, Zin R, Saidin M, Mohammed A. Occupational Safety and Health (OSH) management systems: towards development of safety and health culture. *Proceedings of the 6th Asia-Pacific Structural Engineering and Construction Conference*. Malaysia.2006.
6. Fang D, Chen Y, Wong L .Safety Climate in Construction Industry: A Case Study in Hong Kong. *Journal of Construction Engineering and Management*. 2006;132(6).
7. Zhou Q, Fang D, Mohamed S. Safety Climate Improvement: Case Study in a Chinese Construction Company. *Journal of Construction Engineering and Management*. 2011;137(1).
8. Gholipour Y. Injury minimization in construction projects. *Injury control and safety promotion*. PubMed PMID: 14977508. Epub 2004/02/24. 2004 Mar;11(1):63-5.
9. EFDR. Growth and Transformation Plan (2010/11-2014/15) Annual Progress Report for F.Y. 2010/11. . Addis Ababa, Ethiopia 2012.
10. EFDR.Ministry of constrction and urban development, project implmentation capacity and job opportunity strategies. Addis Ababa: Ministry of Construction and Urban Development; 2012.
11. Priyadarshani K, Karunasena G, Jayasuriya S. Construction Safety Assessment Framework for Developing Countries: A Case Study of Sri Lanka. *Journal of Construction in Developing Countries*. 2013;18:33–51.
12. Rubio M.C , Menendez A, Rubio J.C, Martinez G .Obligations and responsibilities of civil engineers for the prevention of labor risks. *Journal of Professional Issues in Engineering Education and Practice*. 2005;131:70–5.
13. Smallwood J, Haupt T, Shakantu W. *Construction Health and Safety in South Africa*. South Africa: Cidb, 2009.

14. Arslan G, Kivrak S .Safety and health practices in construction: an investigation among construction workers. Turkey; 2008.
15. Toole TM. Construction site safety roles. *Journal of Construction Engineering and Management*. 2002;128:203-10.
16. Antonsen S. Safety Culture Assessment: A Mission Impossible? . *Journal of Contingencies and Crisis Management*. 2009;17.
17. Oltedal H, Wadsworth E. Risk perception in the Norwegian shipping industry and identification of influencing factors. *flagship journal of international shipping and port research*. 2010;37:601–23.
18. Zhang L, Gao Y. Safety Culture Model and Influencing Factors Analysis in Construction Enterprises of China. *Research Journal of Applied Sciences, Engineering and Technology*. 2012;4.
19. Flin R, Mearns K, O'Connor P, Bryden R. Measuring safety climate: Identifying the common features. *Safety Science*. 2000;34.
20. Agwu M & Olele H. Fatalities in the Nigerian Construction Industry: A Case of Poor Safety Culture British. *Journal of Economics, Management & Trade*. 2014;4.
21. Sadek Z. Construction Safety and Health Performance in Dubai. Presented in Partial Fulfillment of the Requirements for the Degree Master of Construction Project Management in the Graduate School of Built and Environment. Heriot Watt University;2013.
22. GOSI, General Organization for Social Insurance - Annual statistical report 1433 H. 2011. [Online].[Internet]. 2011 may 2014.
23. AL-KILANI F. Improving Safety Performance in Construction Projects in Libya (Case Study: in Tripoli City). thesis for the requirements to obtain a Master Degree in Civil Engineering. Diponegoro University;2011.
24. Rafiq M, Choudhry, Fang D, Lingard H. Measuring Safety Climate of a Construction Company. *Journal of Construction Engineering and Management*. 2009;135.
25. Zohar D. Safety climate in industrial organizations: Theoretical and applied implications. *J Appl Psychol*. 1980;65.
26. Mohamed S. Safety Climate in Construction Site Environments. *Journal of Construction Engineering and Management*. 2002;128.
27. Kines P, Lappalainen J, Mikkelsen K, Olsen E, Pousette A, Tharaldsen J, et al. Nordic Safety Climate Questionnaire (NOSACQ-50): A new tool for diagnosing occupational safety climate. *International Journal of Industrial Ergonomics*. 2011;41:634-46.

28. Golda, E. O. Framework for developing and sustaining sound safety culture in a developing economy. *European Journal of Natural and Applied Sciences*; 2013: 1(1), 28-37.
29. Flin R. & Yule S. 2004. Leadership for safety: industrial experience. *Quality and Safety in Health Care* 13: 45-5.
30. Andoh M. The relationship between leadership style and safety Climate: a case study of goldfields Ghana limited Tarkwa-cil plant. Ghana.2013.
31. Jeffcott, S., Pidgeon, N., Weyman, A., Walls, J., Risk, trust, and safety culture in UK train operating companies. *Risk Analysis* .2006, 26 (5).
32. Clarke S. Contrasting perceptual, attitudinal and dispositional approaches to accident involvement in the workplace. *Safety Science*.2006b, 44 (6),
33. Hale A.R., Culture's confusions. *Safety Science* 2000, 34.
34. Filho G, Andrade J, Marinho M. A safety culture maturity model for petrochemical companies in Brazil. *Safety Science*, 2010 48:615–624.
35. Nordic safety climate Questionnaire (NOSCAQ-50).available at <http://www.arbejdsmiljoforskning.dk/da/publikationer/spoergeskemaer/nosacq-50/how-to-use-nosacq-50/>.Accessed at January 2014.
36. Siu O.-I., Phillips D. R., Luung T.-w. "Age differences in safety attitudes and safety performance in Hong Kong construction workers." *J. Safety Res*.2003, 34,199–205.
37. Taylor R. 2005. Achieving a Good Safety Culture – the people dimension in health, safety and Environmental performance. *Hazards Forum*. London
38. ILO. Global strategy on occupational Safety and Health. Conclusions adopted by the International Labour Conference at its 91st Session, 2003.

9. Annex

9.1. Annex I: English version questionnaire

University of Gondar

College of Medicine and Health Science

Institute of public Health

Questionnaire for Assessment of level of safety culture and associated factors with it in “X”
Construction Company workers, Ethiopia.

Name of Project site -----

Verbal consent form

How are you? I am-----.I am working as data collector with Engidawork Kibneh, who is doing a research for partial fulfillment of the requirement of Master of public health in Occupational safety and health management at University of Gondar. The purpose of this questionnaire is to gather information on safety culture and factors associated with it. The results of the study are important to develop the safety culture of construction workers and sustaining its practicability and to create conducive environment for increasing productivity.

I would like to ask you few Questions. Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential. Your participation is voluntary and you are not obligate to answer any question you do not wish to answer. If you fill discomfort with the interview, please fill free to drop out at any time you want. This interview will take 30 minutes. Could I have your permission to continue?

1. Yes

2. No

Informed consent certified by

Interviewer ----- signature-----

Date of interview ----- time started ----- time completed-----

Result of interview 1. Completed 2. Partially completed 3. Refused

Checked by: Supervisor Name: -----signature ----- date -----

Questionnaire identification number-----

Part I. Socio-demographic factors and Behavioral factors/individual's life style.

Direction: Choose one possible answer and circle it.

No	Question	Possible response	Code	Remark
001	Sex	1. Male 2. Female		
002	Age			
003	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others		
004	Marital status	1. Married 2.Single 3. Divorced 4.Widowed 5. Separated		
005	Number of family members			
006	Family members supported			
007	Educational status	1.Illiterate 2.read and write 3.Primary school(1-8) 4.Secondary school(9-12) 5.Technical and vocational 6. Degree or higher		
008	Employment pattern	1.Daily laborer 2.Contract(for specified time and work) 3.Permanent(for unspecified period 4.Other,specify-----		
009	current occupation(circle one)	1.Daily laborer 2.Plasterer 3 Carpenter 4.Mason		

		5.Welder/electrician 6.Painter 7. Driver/operator 8. engineer 9. Other, specify-----		
010	How long have you been working at X Construction company?			
012	Did you work in other construction companies other than ' X ' construction company	1. Yes 2. No		
013	If yes for Question no.012 How many other construction companies			
014	Area of Residence	1. Urban 2. Rural		
015	How far you travel from your residence to your work place? in Kms			
016	monthly Income including over time	-----ETB/month		
017	Have you heard of the term" safety culture" before?	1. Yes 2. No		
018	If yes for Question no. 017 where you listen?	1. On Health and safety training 2. Coworker/ boss 3. Media 4. Others		
019	For how many hours do you sleep every day			
020	Do you sleep well? Is your sleeping continuous with out any intermittence?	1.Yes,without any intermittence 2.no,there is intermittence some times		
021	If no to Q-020,what are the main reasons, specify	1.Employment relation is not healthy, workers' rights are not respected		

		<p>2.The salary is low and there is no other benefit package</p> <p>3.The relation between management and worker is not healthy and is not participatory</p> <p>4.Working condition is poor, no OSH standard is respected</p> <p>5.Any other, specify-----</p>		
022	Have you ever been injured during your work in previous 12 months period	1. Yes 2. No		
023	How many times?			
024	Do you drink alcohol?	<p>1.Yes,frequently</p> <p>2.Yes,Some times on occasional basis</p> <p>3.Not at all</p>		
025	If yes frequently or on occasion for Question no 24, how often do you take?	<p>1.Every other day</p> <p>2.Two days a week</p> <p>3.One day a week or less frequent than this</p> <p>4.Any other, specify,-----</p>		
026	Do you chew Khat?	1. Yes 2. No		
027	Do you smoke cigarette?	<p>1.Yes</p> <p>2.No</p>		
028	If yes to Q-026, What is the average number of cigarette you smoke per day?	----- cigarettes		
029	Are you happy or satisfied with the job you are engaged now?	<p>1.Yes to utmost level</p> <p>2. Yes to some degree</p> <p>3. Not at all</p>		
030	If yes to Q-028 to at most or to some degree, what makes you happy on your	1.the over all employment relation is good and fundamental rights are		

	current job?(check all)	<p>respected</p> <p>2.The salary is good and other benefits are available</p> <p>3.The relation between management and workers is healthy and participatory</p> <p>4,Occupational safety and health standards are maintained and work places are safe and healthy</p> <p>5.Any other, specify-----</p>		
--	-------------------------	--	--	--

Part II: In the following section please describe how you perceive that the managers and supervisors at this workplace handle safety. Although some questions may appear very similar, please answer each one of them.

Strongly disagree	Disagree	Agree	Strongly agree
Put only one X for each question			

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Management encourages employees here to
Work in accordance with safety rules - even when
The work schedule is tight | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Management ensures that everyone receives the
Necessary information on safety | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Management looks the other way when someone
Is careless with safety | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Management places safety before production | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Management accepts employees here taking risks
When the work schedule is tight | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. We who work here have confidence in the
Management's ability to handle safety | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Management ensures that safety problems
Discovered during safety rounds/evaluations
Are corrected immediately | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. When a risk is detected, management
Ignores it without action | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Management lacks the ability to handle
Safety properly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Management strives to design safety routines
That are meaningful and actually works | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Management makes sure that each and
everyone can influence safety in their work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Management encourages employees here to
participate in decisions which affect their safety | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Management never considers employees'
suggestions regarding safety | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

14. Management strives for everybody at the worksite to have high competence concerning safety and risks	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. Management never asks employees for their opinions before making decisions regarding safety	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
16. Management involves employees in decisions regarding safety	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
17. Management collects accurate information in accident investigations	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
18. Fear of sanctions (negative consequences) from management discourages employees here from reporting near-miss accidents	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. Management listens carefully to all who have been involved in an accident event	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20. Management looks for causes, not guilty persons, when an accident occurs	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
21. Management always blames employees for accidents	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
22. Management treats employees involved in an accident fairly	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Part III: In the following section please describe how you perceive that employees at this workplace handle safety

Strongly disagree	Disagree	Agree	Strongly agree
Put only one X for each question			

23. We who work here try hard together to achieve a high level of safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. We who work here take joint responsibility to ensure that the workplace is always kept tidy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. We who work here do not care about each others' safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. We who work here avoid tackle risks that are discovered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. We who work here help each other to work safely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. We who work here take no responsibility for each others' safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. We who work here regard risks as unavoidable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. We who work here consider minor accidents as a normal part of our daily work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. We who work here accept dangerous behavior as long as there are no accidents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. We who work here break safety rules in order to complete work on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. We who work here never accept risk-taking even if the work schedule is tight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. We who work here consider that our work is unsuitable for cowards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. We who work here accept risk-taking at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. We who work here try to find a solution if someone points out a safety problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. We who work here feel safe when working together	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. We who work here have great trust in each others' ability to ensure safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

39. We who work here learn from our experiences to prevent accidents	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
40. We who work here take each others' opinions and suggestions concerning safety seriously	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
41. We who work here seldom talk about safety	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
42. We who work here always discuss safety issues when such issues come up	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
43. We who work here can talk freely and openly about safety	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
44. We who work here consider that a good safety representative plays an important role in preventing accidents	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
45. We who work here consider that safety Rounds/evaluations have no effect on safety	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
46. We who work here consider that safety training is good for preventing accidents	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
47. We who work here consider early planning for safety as meaningless	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
48. We who work here consider that safety rounds/evaluations help find serious hazards	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
49. We who work here consider that safety training is meaningless	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
50. We who work here consider that it is important that there are clear-cut goals for safety	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

This is the end of our questionnaire .We thank you very much for taking time to answer these questions. We appreciate your cooperation

9.2. Annex 2 Amharic version Questionnaire

በጎንደር ዩኒቨርሲቲ

ህክምናና ጤና ሳይንስ ኮሌጅ

የህብረተሰብ ጤና አጠባበቅ ት/ቤት

ይህ መጠይቅ በ 'X' ኮንስትራክሽን ድርጅት ውስጥ የሚሰሩ ሠራተኞችን የሙያ ደህንነት ባህላቸውን ለማጥናት የተዘጋጀ ነው፡፡

የፕሮጀክቱ ስም-----

የቃለ ፍቃድ መጠየቂያ ቅፅ

እንደምን ሰነብቱ? እኔ----- እባላለሁ ፡፡ በጎንደር ዩኒቨርሲቲ በህብረተሰብ ጤና አጠባበቅ በሙያ ደህንነትና ጤና አጠባበቅ አመራር የሁለተኛ ዲግሪ ትምህርቱን ለማጠናቀቅ ትምህርታዊ ጥናት ከሚያደርገው ከተማሪ እንግዳወርቅ ክብነህ ጋር በመረጃ ሰብሳቢነት በመስራት ላይ ነኝ፡፡ የቃለ መጠየቁም ጠቀሜታ በሙያ ደህንነት ባህልንና ተዛማጅ ጉዳዮችን የተመለከተ መረጃ ለመሰብሰብ ነው፡፡ የጥናቱ ውጤት ጠቀሜታው በኮንስትራክሽን ኢንዱስትሪ የሚሠሩ ሠራተኞችን የሙያ ደህንነት ባህልን ለማሳደግና ተግባራዊነቱን ዘለቁታዊ ለማድረግ የሚረዳ እና ምቹ የስራ አካባቢን በመፍጠር ምርታማነትን ለማሳደግ የበኩሉን አስተዋፅኦ የሚኖረው ይሆናል፡፡

ጥቂት ጥያቄዎችን ልጠይቆት እፈልጋለሁኝ፡፡ የሚሠጡኝ መረጃ ከእርሶ ስምና ማንነት ጋር በተያያዘ በጭራሽ እርሶን በማይገልፅ መልኩ የምንጠቀም ሲሆን የሚሠጡትም መረጃ በሚስጥር የሚያዝ ይሆናል፡፡ የእርሶም ተሳትፎ በፈቃደኝነት ላይ የተመሠረተ ሲሆን መመለስ የማይፈልጉትን ጥያቄ እንዲመልሱ አይገደዱም፡፡ በቃለ መጠየቁ ደስተኛ ካልሆኑ በማንኛውም ሰዓት ቃለ መጠየቁን የማቆም መብት አልዎት፡፡ ቃለ መጠየቁም የሚወስደው 30 ደቂቃ ነው፡፡

ለመቀጠል ፍቃደኛ ኖት፡፡ 1. አዎ 2. የለም

መጠየቅ ያደረገው ሰው ----- ፊርማ -----

መጠይቁ የተሞላበት ቀን ----- የተጀመረበት ሰዓት ----- ያለቀበት ሰዓት-----

የቃለ መጠየቁ ውጤት 1. ተጠናቋል 2. በከፊል ተጠናቋል 3. አልተጠናቀቀም

የመጠየቂያ ቅፅ መለያ ቁጥር -----

ክፍል አንድ፡ የሥነ ሕዝብ፣ ማህበራዊና የግለሰብ ባሕሪያትን የተመለከተ

መመሪያ፡ ለሚከተሉት ጥያቄዎች በተሰጠው ክፍት ቦታ ወይም ከተዘረዘሩት ምርጫዎች ተጠያቂዎች የሰጡትን መልስ ዓፍ ወይም ቁጥሩን ብቻ ምርጥ/ምረጩ ::

ቁጥር	ጥያቄ	የሚጠበቁ ምላሾች	ኮድ	ምርመራ
001	ፆታ	1. ወንድ 2. ሴት		
002	ዕድሜ	----- ዓመት		
003	ሃይማኖት	1. ኦርቶዶክስ 2. እስልምና 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይገለጽ....		
004	የጋብቻ ሁኔታ	1. ያገባ 2. ያላገባ 3. የተፋታ/ች 4. ባል/ሚስት የሞተባቸው 5. የተለያዩ		
005	የቤተሰብ አባላት ቁጥር			
006	የሚያስተዳድሩት/የሚረዱት የቤተሰብ ብዛት			
007	የትምህርት ደረጃ	1. ያልተማረ/ች/ 2. ማንበብና መጻፍ የሚችል 3. የመጀመሪያ ደረጃ ትምህርት /ከ1ኛ - 8ኛ ክፍል/ 4. ሁለተኛ ደረጃ/ከ9ኛ - 12ኛ ክፍል/ 5. ቴክኒክና ሙያ 6. ድግሪና ከዚያ በላይ -----		
008	የቅጥር ሁኔታ	1. በቀን ሠራተኛነት 2. ለተወሰነ ሥራና ለተወሰነ ጊዜ ቅጥር 3. ላልተወሰነ ጊዜ ቅጥር 4. ሌላ ካለ ይገለጹ		
009	አሁን የተሰማሩበትን የሥራ አይነት ከተሰጡት አማራጮች አንዱን ያክብቡ	1. የቀን ሠራተኛ 2. ለሣኝ 3. አናጺ 4. ግንበኛ 5. በያጅ/ኤሌክትሪሻን 6. ቀለም ቀቢ 7. ሾፌር/ኦፕሬተር 8. መሃንዲስ 9. ሌላ-----		
010	በ 'X' ኮንስትራክሽን ድርጅት ውስጥ ለምን ያህል ጊዜ አገልግለዋል::			
011	በዚህ ሥራ ላይ ለምን ያህል ጊዜ ሠርተዋል::			
012	ከ 'X' ኮንስትራክሽን ድርጅት ውጪ ሌላ ኮንስትራክሽን	1. አዎ 2. የለም		

	ድርጅት ሠርተዋል			
013	ለተራ ቁጥር 012 መልሶ አዎ ከሆነ ስንት የኮንስትራክሽን ድርጅት?			
014	የመኖሪያ ክልልዎ የት ነው?	1. ከተማ 2. ገጠር		
015	የሥራ ቦታዎ ከመኖሪያ ቦታዎ ምን ያህል ይርቃል? በኪሎ ሜትር			
016	ወርዓዊ ክፍያዎ ከትርፍ ሰዓት ጋር ምን ያህል ነው?	----- ብር		
017	ከዚህ በፊት ስለ ሙያ ደህንነት ባህል ሰምተው ያውቃሉ?	1. አዎ 2. የለም		
018	ለተራ ቁጥር 017 መልሶ አዎ ከሆነ የት ነው የሰሙት?	1. የሙያ ደህንነት ስልጠና ላይ 2. ከስራ ባልደረባ/ኃላፊ 3. ከመገናኛ ብዙሃን 4. ሌላ-----		
019	በየቀኑ ለስንት ሰዓት ይተኛሉ? ሰዓት		
020	በሚገባ እንቅልፍ ይወስድዎታል? የእንቅልፍ ጊዜዎ ጤናማ ነው በመሃል አይቀሰቀሱም?	1. አዎ ያለምንም እንቅልፍ ማቋረጥ እተኛለሁ 2. አይደለም አንዳንድ ጊዜ በመረበሽ በመሃል እነቃለሁ		
021	ለጥያቄ ቁ 020 መልስዎ አይደለም ከሆነ ለዚህ ምክንያት ምንድን ነው?	1. የሥራ ግንኙነት ጤናማ አይደለም 2. ደመወዝ አነስተኛ ስለሆነና ሌሎች ጥቅማጥቅሞች ስሌሉ 3. በአሠራርና ሠራተኛ መካከል ጤናማ ግንኙነት የለም ሥራዎች አሳታፊ አይደሉም 4. የሥራ ቦታ ደህንነትና ጤንነት የተሟሉ አይደለም ሥራው አደገኛና ለጉዳት/ለአደጋ ስጋት የሚያጋልጥ ስለሆነ 5. ሌላ ካለ ይገለጽ-----		
022	ባለፉት 12 ወራት ውስጥ የሥራ ላይ አደጋ/ጉዳት ደርሶብት ያውቃል ?	1. አዎ 2. አይደለም		
023	አደጋው ስንት ጊዜ ደርሶብዎታል?	1. አደጋው ስንት ጊዜ እንደደረሰቦት ይግለጹ 2. አላስታውስም		
024	አልኮል መጠጥ ይጠጣሉ?	1. አዎ ሁል ጊዜ እጠጣለሁ 2. አዎ ግን አንዳንድ ጊዜ ብቻ 3. ጭራሽ አልጠጣም		
025	ለጥያቄ ቁ 024 መልስዎ ሁል ጊዜ ወይም አንዳንድ ጊዜ ከሆነ በምን ያህል ጊዜ ይጠጣሉ?	1. አንድ ቀን አልፎ በሚቀጥለው ጊዜ 2. በሳምንት ሁለት ቀን 3. በሳምንት አንድ ቀን ወይም ከዚህ ላላነሰ ጊዜ 4. ሌላ ካለ ይገለጽ		
026	ጫት ይቅማሉ ?	1. አዎ 2. አይደለም		
027	ሲጋራ ያጨሳሉ?	1. አዎ 2. አይደለም		
028	ለጥያቄ ቁ 026 መልስዎ አዎ ከሆነ በግምት በቀን ስንት ሲጋራ ----- ሲጋራዎች አጨሳለሁ			

	ያጨሳሉ?			
029	አሁን እየሠሩ ባሉበት ሥራዎች ደስተኛ ነዎት?	1. አዎ ሙሉ በሙሉ ደስተኛ 2. በተወሰነ ደረጃ ደስተኛ ነኝ 3. አይደለም ደስተኛ አይደለሁም		
030	ለጥያቄ ቁ 028 መልሶ ሙሉ በሙሉ/ በተወሰነ ደረጃ ደስተኛ ከሆኑ ምክንያቱ ምንድን ነው	1. የስራ ግንኙነት ጥሩ ስለሆነና መሠረታዊ መብቶቻችን ስለሚጠበቁ 2. የደሞዝ ክፍያው ጥሩ ስለሆነና ሌሎች ጥቅማ ጥቅሞች ስላሉ 3. በአሠሪና ሠራተኛ መካከል መልካም ግንኙነት ስላለና ስራዎች በሚሠሩበት ጊዜ አሳታፊ ስለሆነ 4. የሥራ ቦታ ደህንነትና ጤንነት የተሟላ ስለሆነ 5. ሌላ ካለ ይግለፁ		

ክፍል ሁለት፡ በሚቀጥለው ክፍል ላይ በዚህ ስራ ቦታ የቅርብ ኃላፊዎች/ማናጅመንት ስለ ሙያ ደህንነት ያላቸውን ግንዛቤ ይግለፁ፡፡ አንዳንድ ጥያቄዎች ተመሳሳይ ሊመስሉ ይችላሉ ነገር ግን ለሁሉም ጥያቄዎች የእርሶ ምላሽ አስፈላጊ ስለሆነ በትዕግስት እንዲመልሱል እንጠይቃለን፡፡

በጣም አልሰማማም	አልሰማማም	እስማማለሁ	በጣም ሰማማለሁኝ
ለእያንዳንዱ ጥያቄ አንድ የX ምልክት ብቻ ያድርጉ			

- የድርጅቱ ማኔጅመንት/ኃላፊ የስራ ጫና በሚኖርበትም ወቅትም ቢሆን የሙያ ደህንነት ህግ/መመሪያ ሠራተኞች ተከትለው እንዲሠሩ ያበረታታል፡፡ ☐ ☐ ☐ ☐
- እያንዳንዱ ሠራተኛ አስፈላጊ የሙያ ደህንነት መረጃ መቀበላቸውን ኃላፊ ያረጋግጣል፡፡ ☐ ☐ ☐ ☐
- ሠራተኞች ስለ ሙያ ደህንነት ችላ/ትኩረት በማይሰጡበት ጊዜ ኃላፊዎች ሌላ የሚተገበርበት አማራጭ መንገድ ይፈልጋሉ፡፡ ☐ ☐ ☐ ☐
- የድርጅቱ ኃላፊዎች የሙያ ደህንነትን ከውጤታማነት/ምርታማነት ያስቀድማሉ፡፡ ☐ ☐ ☐ ☐
- ሠራተኞች አደጋ ሊያስከትል የሚችል ነገር ተጋልጠው ሳለ ከስራ ጫና የተነሳ ኃላፊዎች በዝምታ ያልፋሉ፡፡ ☐ ☐ ☐ ☐
- እኛ እዚህ ድርጅት ውስጥ የምንሠራ ሠራተኞች በኃላፊዎች የሙያ ደህንነት ችግር የመፍታት አቅም ላይ እንተማመናለን፡፡ ☐ ☐ ☐ ☐
- የሙያ ደህንነት ችግሮችን ለመለየት ፍተሻ/ጉብኝት በሚደረግበት ጊዜ በትክክል ችግሮች መገኝታቸውንና አፋጣኝ እርምጃ መወሰዱን ኃላፊዎች ያረጋግጣሉ፡፡ ☐ ☐ ☐ ☐
- የስራ ላይ አደጋ ሊያደርስ/ሊያስከትል የሚችል ነገሮች ተለይተው ከታወቁ በኋላም ኃላፊዎች እርምጃ ሳይወስዱ በዝምታ ያልፋሉ፡፡ ☐ ☐ ☐ ☐
- የድርጅታችን ኃላፊዎች የሙያ ደህንነት ችግሮች በትክክል የመፍታት ብቃት ያንሳቸዋል፡፡ ☐ ☐ ☐ ☐
- የድርጅታችን ኃላፊዎች ትርጉም ያለውና የሚሠራ የሙያ ደህንነት ክፍለጊዜ ዲዛይን ለማድረግ ይጥራሉ፡፡ ☐ ☐ ☐ ☐
- እያንዳንዱ ሠራተኛ በሚሠራው ስራ የሙያ ደህንነትን ☐ ☐ ☐ ☐

እየተገበረ መሆኑን የቅርብ ኃላፊ ያረጋግጣል፡፡

12. የሠራተኞችን ደህንነት ሊጎዳ የሚችል ነገር
 ሲያጋጥም ሠራተኞች በውሳኔ ሰጪነት
 እንዲሳተፉ ኃላፊዎች ያበረታታሉ፡፡
13. በሙያ ደህንነት ዙሪያ ሠራተኞች የሚያቀርቡትን
 ሀሳብ ኃላፊዎች አይቀበሉም፡፡
14. በስራ ቦታ ላይ እያንዳንዱ ሰው በሙያ ደህንነትና አደጋ
 ሊያስከትል የሚችል ሁኔታዎች በተመለከተ ከፍተኛ ችሎታ
 እንዲኖረው ኃላፊዎች ይጥራሉ፡፡
15. ኃላፊዎች በሙያ ደህንነት ዙሪያ ውሳኔ ከመስጠታቸው
 በፊት የሠራተኞችን አስተያየት ጠይቀው አያቁም፡፡
16. በሙያ ደህንነት ዙሪያ በውሳኔ ሰጪነት ሠራተኞች
 አብረው እንዲሳተፉ ኃላፊዎች ያበረታታሉ፡፡
17. የአደጋ/ጉዳት የመለየት ምርመራ በሚካሄድበት ጊዜ
 ትክክለኛው መረጃ ኃላፊዎች ይሰበስባሉ፡፡
18. የትኛውንም አደጋ ሊያደርስ የሚችልና
 የሚደርሱባንን ጥቃቅን አደጋዎች ሪፖርት ለማድረግ
 ከኃላፊዎች ቅጣት ይደርስብናል ብለን ስለምናስብ
 ሪፖርት ለማድረግ እንፈራለን፡፡
19. ኃላፊዎች አደጋው በሚደርስበት ጊዜ የነበሩትን ሁሉንም
 ሠራተኞች በጥሞና ያዳምጣሉ፡፡
20. አደጋ በሚደርስበት ጊዜ ኃላፊዎች ጥፋተኛውን ሰው
 ሳይሆን የአደጋው መንስኤ ላይ ትኩረት ያደርጋሉ፡፡
21. ሁልጊዜ ኃላፊዎች አደጋ በሚከሰትበት ወቅት
 ሠራተኞችን ይወቅሳሉ፡፡
22. አደጋው በደረሰበት ወቅት ሲሰሩ የነበሩ ሠራተኞችን
 ኃላፊዎች በተገቢው መልኩ ያስተናግዳሉ፡፡

ክፍል ሶስት፡ ይህ ክፍል ሠራተኞች በዚህ የስራ ቦታ ስለሙያ ደህንነት የሚያስቡት ይግለፁልን፡፡

በጣም አልስማማም	አልስማማም	እስማማለሁ	በጣም እስማማለሁ
ለእያንዳንዱ ጥያቄ አንድ የX ምልክት ብቻ ያድርጉ			

23. እዚህ ድርጅት ውስጥ የምንሠራ ሠራተኞች ሁላችንም
የሙያ ደህንነት የላቀ ደረጃ እንዲደርስ እንሞክራለን፡፡ ☐ ☐ ☐ ☐
24. ሁሌም የስራ አከባቢያችን ንፁህና ከአደጋ የፀዳ
እንዲሆን ሁላችንም ሠራተኞች በጋራ እንተረጋገጥን፡፡ ☐ ☐ ☐ ☐
25. እዚህ የምንሠራ ሠራተኞች አንዱ ለአንዱ ሠራተኛ
ደህንነት አይጨነቅም፡፡ ☐ ☐ ☐ ☐
26. ሁላችንም እዚህ የምንሠራ ሠራተኞች ስራችንን
በምናከናወንበት የተለዩ አደጋ ሊያስከትሉ
የሚችሉ ሁኔታዎች እንዳይደርሱ እንከላከላለን፡፡ ☐ ☐ ☐ ☐
27. ሁላችንም ሠራተኞች ስራችንን በጥንቃቄ ለማከናወን
እርስ በርሳችን እንተባበራለን፡፡ ☐ ☐ ☐ ☐
28. እዚህ የምንሠራ ሠራተኞች ለስራ ባልደረባችን ደህንነት
ግድ አይለንም፡፡ ☐ ☐ ☐ ☐
29. ሁላችንም እዚህ የምንሠራ ሠራተኞች አደጋ/ጉዳት
ሊያስከትል የሚችል ነገር ሊወገድ እንደማይችል እናስባለን፡፡ ☐ ☐ ☐ ☐
30. እዚህ የምንሠራ ሠራተኞች ሁላችንም አነስተኛ
አደጋዎች/ጉዳቶችን መደበኛ የዕለት ተግባራችን አካል
አድርገን እንጂ እንደ አደጋ አንቆጥራቸውም፡፡ ☐ ☐ ☐ ☐
31. ሁላችንም ሠራተኞች አደጋ ሊያስከትል የሚችል
ሰባህሪም ሆነ ምንም አይነት አደጋ ሊደርስ
እንደማይችል እናስባለን፡፡ ☐ ☐ ☐ ☐
32. ሁላችንም እዚህ የምንሰራ ሠራተኞች ስራችንን
በወቅቱ ለመጨረስ የሙያ ደህንነት መመሪያዎችን እናፈርሳለን፡፡ ☐ ☐ ☐ ☐
33. ሁላችንም እዚህ የምንሠራ ሠራተኞች ምንም እንኳን
የስራ ጫና ቢኖርም አደጋ የሚያስከትሉ ነገሮችን በዝምታ አናልፋቸውም፡፡ ☐ ☐ ☐ ☐
34. እዚህ የምንሠራ ሁላችንም ስራችን ኅበዝ ያልሆኑ ሰዎች
እንደማይመች እናስባለን፡፡ ☐ ☐ ☐ ☐
35. ሁላችን እዚህ የምንሠራ ሠራተኞች በስራ ላይ
ጉዳት/አደጋ ሊያስከትሉ የሚችሉ ነገሮችን በዝምታ እናልፋቸዋለን፡፡ ☐ ☐ ☐ ☐

36. ሁላችንም ሠራተኞች ማንኛው የስራ ባልደረባችን
 የሙያ ደህንነት ችግር ሲያጋጥመዉ መፍትሄ ለመፈለግ እንሞክራለን፡፡
37. ሁላችንም ሠራተኞች በጋራ በምንሠራበት ጊዜ
 ምንም አይነት የደህንነት ስጋት አይዘገም፡፡
38. እዚህ የምንሠራ ሁላችንም ሠራተኞች በስራ
 ባልደረባችን የሙያ ደህንነት ብቃት ላይ እንተማመናለን፡፡
39. ሁላችንም ሠራተኞች ካለፉት ስህተቶቻችን በመማር አደጋ/
 ጉዳት እንዳይደርስ እንከላከላለን፡፡
40. ሁላችንም እዚህ የምንሠራ ሠራተኞች አንዳችን
 የሌላውን በሙያ ደህንነት ዙሪያ ምክርም ሆነ ሀሳብ እንቀበላለን፡፡
41. ሁላችንም እዚህ የምንሠራ ሠራተኞች ስለሙያ ደህንነት
 ተነጋግረን አናውቅም፡፡
42. የሙያ ደህንነት ሀሳብ በሚነሳበት ወቅት ሁልጊዜ ሁላችንም
 እዚህ የምንሠራ ሠራተኞች እንወያያለን፡፡
43. ሁላችንም እዚህ የምንሠራ ሠራተኞች በነፃነትና በግልፅ
 ስለሙያ ደህንነት እናወራለን፡፡
44. ሁላችንም እዚህ የምንሠራ ሠራተኞች ጥሩ የሙያ ደህንነት
 ተወካይ የስራ ላይ አደጋዎችን/ጉዳቶችን ለመከላከል
 ከፍተኛ ሚና እንዳለው እናስባለን፡፡
45. ሁላችንም ሠራተኞች በስራ ቦታችን ላይ የሚደረጉ
 የሙያ ደህንነት ጉብኝቶችን/ግምገማዎችን በእኛ ደህንነት
 ላይ የተሻለ ለውጥ የላቸውም፡፡
46. ሁላችንም ሠራተኞች የሙያ ደህንነት ስልጠና የስራ ላይ
 አደጋዎችን/ጉዳቶችን ለመከላከል እንደሚጠቅም እንገነዘባለን፡፡
47. ቀደም ብሎ ስለ ሙያ ደህንነት ዕቅድ ማዘጋጀት ትርጉም
 እንደሌለው ሁላችንም እዚህ ምንሠራ ሠራተኞች እናስባለን፡፡
48. ሁላችንም ሠራተኞች በስራ ቦታችን ላይ የሚደረጉ የሙያ ደህንነት
 ጉብኝቶች/ግምገማዎች አደገኛ የሆኑ ጠንቆችን ለመለየት እንደሚረዱ እናምናለን
49. የሙያ ደህንነት ስልጠና ትርጉም እንደሌለው ሁላችንም እዚህ
 የምንሠራ ሠራተኞች እናስባለን፡፡
50. ሁላችንም እዚህ የምንሠራ ሠራተኞች ስለሙያ ደህንነት ግልፅ የሆነ
 ግብ ማስቀመጥ ጠቀሜታው የጎላ ነው ብለን እናምናለን፡፡