EVALUATION OF OCCUPATIONAL SAFETY AND HEALTH IN CONSTRUCTION COMPANIES IN TURKEY

A MASTER'S THESIS

IN

CIVIL ENGINEERING

ATILIM UNIVERSITY

BY

ARDA UZUNOMEROGLU

MAY 2016

EVALUATION OF OCCUPATIONAL SAFETY AND HEALTH IN CONSTRUCTION COMPANIES IN TURKEY

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
ATILIM UNIVERSITY
BY

ARDA UZUNOMEROGLU

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
IN
CIVIL ENGINEERING DEPARTMENT

MAY 2016

Approval of the Graduate School of Natural and Applied Sciences, Atılım University.

_____

Prof. Dr. İbrahim Akman
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

_____

Assoc. Prof. Dr. Tolga Akış
Head of Department

This is to certify that we have read the thesis "Evaluation of Occupational Safety and Health in Construction Companies in Turkey" submitted by Arda Uzunömeroğlu and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

_____

Assist. Prof. Dr. Halit Cenan Mertol

Supervisor

Examining Committee Members

Assoc. Prof. Dr. Tolga Akış _____

Assoc. Prof. Dr. Eray Baran _____

Assist. Prof. Dr. Halit Cenan Mertol _____

Date: 25th of May, 2016

I declare and guarantee that all data, knowledge and information in this document has been obtained, processed and presented in accordance with academic rules and ethical conduct. Based on these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: ARDA UZUNÖMEROĞLU

Signature:

ABSTRACT

EVALUATION OF OCCUPATIONAL SAFETY AND HEALTH IN CONSTRUCTION COMPANIES IN TURKEY

Arda Uzunömeroğlu

M.S., Civil Engineering Department

Supervisor: Assist. Prof. Dr. Halit Cenan Mertol

May 2016, 45 pages

Occupational accidents and injuries lead to serious problems in Turkey and in many other countries. The outcome of occupational accidents can be divided into two categories; economic and social costs. As a result of occupational accidents, permanent disabilities and deaths may occur. The permanent disability of a worker leads to social, economic and psychological problems.

Improving the safety conditions in the construction side is very important to avoid the problems and fatal accidents. The factors which influence the health and safety conditions during construction in Turkey and how to improve their status are explained in this study. A survey was prepared and performed related to the main factors that affect the safety level. The results were evaluated based on four main factors: trainings, supervision, personal attitudes, and administration. Based on this evaluation, the safety level of the workplace is determined.

In addition, the relationship between the size and age of the construction company and the safety level was also evaluated. The results indicated that there is a relationship between age of the company and the safety level in Turkey that needs to be improved. Level of safety about the new companies are lesser than big and older one.

Keywords: Construction site, Turkey, occupational safety and health.

ÖZ

TÜRKİYE'DEKİ YAPIM ŞİRKETLERİNDE İŞ SAĞLIĞI VE GÜVENLİĞİNİN DEĞERLENDİRİLMESİ

Arda Uzunömeroğlu
Yüksek Lisans, İnşaat Mühendisliği Bölümü
Tez Yöneticisi: Yrd. Doç. Dr. Halit Cenan Mertol
Mayıs 2016, 45 sayfa

İş kazaları ve bunların yol açtığı sakatlıklar Türkiye ve diğer bir çok ülkede ciddi problemlere yol açmaktadır. İş kazalarının zararları ekonomik ve sosyal olarak iki katagoriye ayrılabilir. Sonuç olarak iş kazaları, kalıcı sakatlıklara hatta ölümlere sebep olabilir. İşcilerde oluşan kalıcı sakatlıklar, sosyal ve psikolojik problemlere yol açar.

Bu problemlerin sonucu olarak, inşaattaki güvenlik koşullarını değiştirmek ölümcül kazalardan sakınmak adına çok önemlidir. Bu çalışmada, Türkiye'deki inşaat sektöründe iş sağlığı ve güvenliği etkileyen faktörler ve bu faktörlerin nasıl iyileştirilebileceği açıklanmıştır. Güvenlik düzeyini hesaplamak adına, ana faktörlere bağlı olarak bir anket uygulanmıştır. Sonuçlar, eğitim, gözetim, kişisel tutum ve yönetim olarak dört ana faktör altında olarak değerlendirilmiştir. Bu değerlendirme sonunda işyeri güvenlik düzeyi belirlenmiştir.

Bunlara ek olarak bu çalışmada, inşaat firmalarının büyüklükleri ve deneyimleri arasındaki ilişki ve güvenlik seviyeleride çalışılmıştır. Sonuçlara göre, inşaat firmalarının büyüklükleri ve deneyimleri arasında bir ilişki olduğu görülmüş, ve bu ilişkiye bağlı olan Türkiye'deki iş güvenliği düzeyinin genel olarak geliştirilebileceği belirlenmiştir. İş güvenliği seviyesinin eski ve büyük firmalarda yeni ve küçüklere oranla daha yüksek olduğu görülmüştür.

Anahtar Kelimeler: İnşaat sahası, Türkiye, iş sağlığı ve güvenliği.

DEDICATION

This thesis is dedicated to: The sake of Allah, my Creator and my Master,
My great teacher and messenger, Mohammed (May Allah bless and grant him),
who taught us the purpose of life,
My homeland Trabzon, which have the great patriots, the symbol of strength,
My great parents and their endless love, support and encouragement,
My friends Burak, Yasin, Ali, İbrahim who support and exhilarated me,
All the people in my life who touch my soul, I dedicate this research to them.

ACKNOWLEDGMENTS

I would like to express my great appreciation to my supervisor Assist. Prof. Dr. Halit Cenan Mertol, for his guidance, friendship, and encouragement throughout my thesis.

I would like to thank to the members and researchers of my department, Civil Engineering at Atılım University. It's an honor to study at Atılım University, because it has a good academic environment which encourages you to be a professional researcher.

I would like to thank my dear family, my father Hursit Uzunomeroglu,, my mother Suzan, my sister Nilda, and my little brother Anıl.

Finally, I also wish to express my special thanks to my cousin Ali Uzunomeroglu.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 General

Every workplace contains job related hazards. While 2% of these hazards results in accidents which are inevitable, 98% are still avoidable. The purpose of the studies performed in occupational health and safety field is to provide a safer working environment for the work sites.

Turkey is one of the developing and newly industrialized countries. The construction industry is very important for affecting the safety and health and improving the quality of life of the users. Unfortunately, working in the construction industry results in dramatic pain and suffering for many of the construction workers and their families due to occupational accidents, serious injury, and fatality.

Every year, about 1150 workers lose their lives and 1800 workers are injured seriously, become disabled because of occupational accidents in Turkey. These results of occupational accidents produce social problems. Some other losses also happen due to occupational accidents such as economic loses. The economic losses may include work day losses, costs of hospital, health services, home medical care, insurance, safety treatment, emergency services, damage to property, etc. In Turkey, every year economic losses caused by occupational accidents are estimated approximately as 30 million TL (SGK, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014).

Fifteen percent of the whole country work power is working in the construction industry and this percentage takes an important place in the national economy. Considering the improvements in the sector, safety of the work mostly depends on the workers. It is a fact that they often cannot select the place they work and they all have low education level. Construction work is done outdoors, industry is always unrecorded, and the workers do not take necessary precautions. These facts invite accidents to the construction sector. Construction areas are defined as "very hazardous" locations according to the Notification List of Hazard Classes defined by

Occupational Health and Safety by the Ministry of Labor and Social Security (CSGB, 2009). Nearly 8000 accidents happen every year in this sector (SGK, 2010). These numbers are quite high numbers which make this study very compulsory.

1.2 Objectives and Scope

This research is performed to answer the following questions:

- What is the level of safety for workers in the construction industry in Turkey?
- How can we improve the safety and health for the workers during construction?
- Is there a correlation between the safety of the company and project size?

A questionnaire was prepared and performed for companies in Ankara, Turkey. Based on the results of this survey, the main factors which affect the safety of workers were determined. The safety level of the companies was evaluated based on global standards for safety and health. The correlations between the safety level, size, and age (experience) of the construction companies were evaluated. Recommendations to improve the safety and health conditions of workers during construction in Turkey were proposed.

1.3 Thesis Organization

Chapter 1 shortly introduces safety and health for the construction sector.

Chapter 2 focuses on previous researches. Studies discussing the factors affecting health and safety are presented. This chapter establishes clear correlation between safety and health and the factors. Factors are ranked with an order from least important to most important one.

Chapter 3 defines the survey method in details. How the survey was performed on construction workers and administrators of the selected construction companies are explained in this chapter.

Chapter 4 includes the analysis and results of the survey. All the results are evaluated based on four factors related to safety and health of workers during the construction process.

Brief summary and detailed conclusions are presented in Chapter 5.

2 LITERATURE SURVEY

2.1 Introduction

This research was performed to evaluate the safety level of the construction industry in Turkey. There are some variables that influence the safety of construction area. Ceylan (2012) determined that the construction industry was the most hazardous industry than others.

This chapter is related to the previous studies about health and safety of workers in the construction industry. These past researches will form a basis and act as a milestone for this research.

2.2 Occupational Health and Safety

Occupational health and safety (OSH) in work areas is generally explained as a branch of science that is related to removing hazards from work areas. To perform this action, all the partners of the professional sectors shall come together to form national health and safety procedures that protect both environment and people.

The goal of OSH is to perform environmental, cultural, general, and radical changes on the work environment. In the past years, worldwide economy was shaken with both positive and negative effects. Today, the world is rapidly changing, everything is developing, organizational practices are modified, and size of the structure and life period of men and women are extended.

2.3 Relationship between the Safety of Workers and Project Size

Basha et al. (2007) discovered some similarities between age of the construction company and the size of the project. A survey was prepared for people who work in the construction industry. The research was performed in five different construction companies in Kuala Lumpur. The results indicated that larger sized companies had greater health and safety performance than the small ones did have.

2.4 Effect of Cultural Dimension on Workers Safety

Ali et al. (2009) investigated the effects of cultural behaviors on workers in construction industry in Pakistan. This research indicated that personal attitudes and cultural dimensions had a major effect on workers' performance. The results showed that the most significant factor that affected the workers' behavior was supervision and administration pressure. Also it was discovered that if the supervision is performed in a good manner, the safety is performed better. When workers feel unsafe, they behave more cautious and take fewer risks which make them safer.

2.5 Ergonomics and Occupational Safety and Health: An ILO Perspective

Niu (2010) performed a research related to the ergonomics in the light of perspectives by International Labor Organization (ILO). It was found that every year about 2200 worker died because of occupational accident and diseases. Based on the statistics performed in 2005, 355 people had a fatal accident every year (ILO, 2015).

Niu (2010) also discussed the economic costs of construction safety and health problems. For example, every year the cost of manufacturing sector accidents in the United States was more than 180 million US dollars. Work diseases, insurance, loss of productivity, and medical costs were increasing each year. In addition, construction work may result in some various ergonomics problems such as musculoskeletal disorders. These people also may suffer from psychological problems such as environmental factors, stresses, and complex social situations.

The upper body disorders have been described first by Bernardini Ramazzani. Job dissatisfaction, physiological stress and social issues were also first described by him. He was the father of occupational medicine, in the 18^{th} century. He stated that most of the ergonomics diseases were caused by three main reasons which were uncomfortable sitting, repeated motions of the hands, and last inefficiency and inability of the brain (Ramazzini, 1682).

2.6 Occupational Health and Safety in Germany: A Risk-Based Approach?

A was study performed by Haubert (2012) which focused the regulation in Germany. This study tried to find some answers related to the status of safety level of occupational safety and health in Germany? This research showed that some variations may exist between the cities of regions throughout Germany. A survey was performed on the participants chosen from randomly German cities. This technique decreased the obstacles such as high refuse rates.

In this research, 18 participants were considered and these participants were interviewed one by one. The participants included local administrators, occupational health and safety officers, insurance company workers, federal committee members and governmental research institution members. The answers of these participants were assumed to reflect the perspective of the association that they worked for. Interviews were performed face to face. It took approximately 1 hour and all interviews were recorded. At the end of this study, a data was collected and the literature related to the regulations was established.

2.7 Who is at Fault? Child Injuries at Construction Sites in Turkey

Gurcanli (2008) discussed the child injuries in construction areas. He performed a research on the causes of the accidents, determined the parties which were at fault and the negligence behind them. Nine hundred and fifty six expert witness reports, which were submitted to criminal and labor courts, were investigated. Third party and child fatalities were analyzed according to their reasons, types of construction, and the times at which they occurred. According to the court decisions, parties at fault in the accidents were discussed by revealing the primary negligent acts of the parties. Additionally, this research discussed the most hazardous conditions and safety violations along with legislative responsibilities and obligations of employers and employees. The safety requirements and legal provisions that were stipulated by the Turkish legislation were also described and discussed in this study.

2.8 Analysis of Occupational Accidents According to the Sectors in Turkey

Several researchers performed studies on the factors affecting health and safety of the construction workers. Ceylan (2012) discussed the accidents with respect to the sectors in Turkey. The goal of this study was to discover the number of occupational accidents. The sectors with the highest accident numbers were construction, mining and metal. The data was provided from monthly report of the Ministry of Labor and Social Security of Turkey. The data was related to the years between 2004 and 2014, it showed that 46,4% of the accidents and 41% of the fatal accident occurs in these 3 sectors.

Turkey had lower death rates at the age of between 10 to 18 and 55 to 62. The death rate increased for middle aged people who were between the age of 21 to 50. The workers who were most active and efficient had more fatal accidents than the other ages have as shown in Figure 2-1 and Figure 2-2. These figures also indicated that there was a relationship between the number of deaths and ages. When the highest points of the bar charts in these figures were connected to each other, these points produced a convex curve. Results of this study produced a concave curve. These results indicated that young workers and very older workers is under the risk of lesser accidents in the construction sites. However, middle aged workers were faced with much more accidents compared to the others.

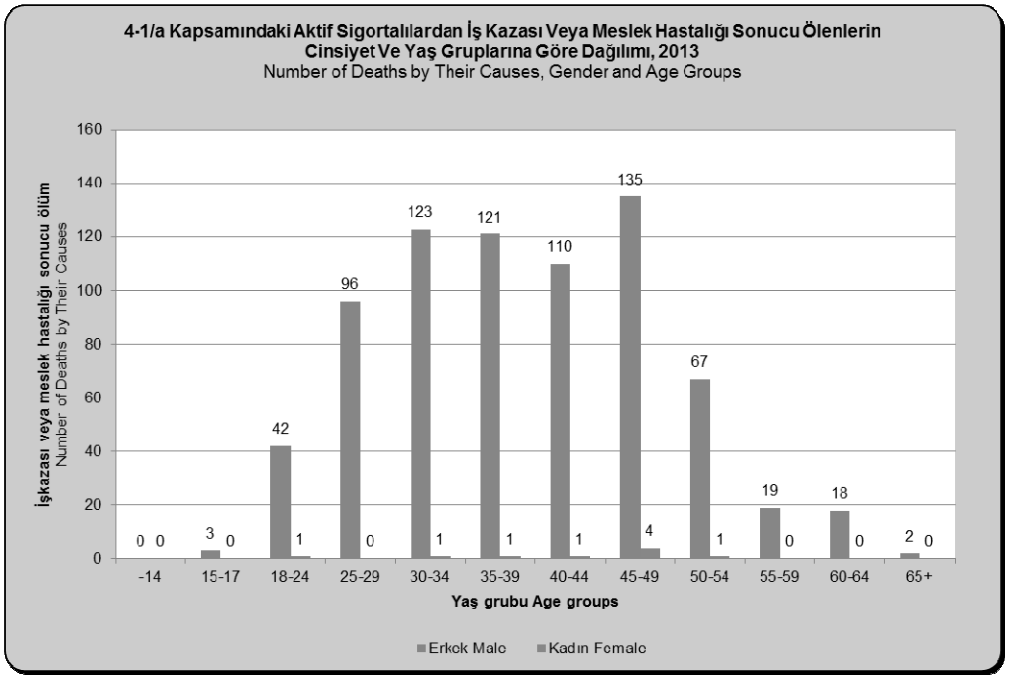

Figure 2-1 – Number of deaths by their causes, gender and age groups year 2013 (SGK Year Book, 2013)

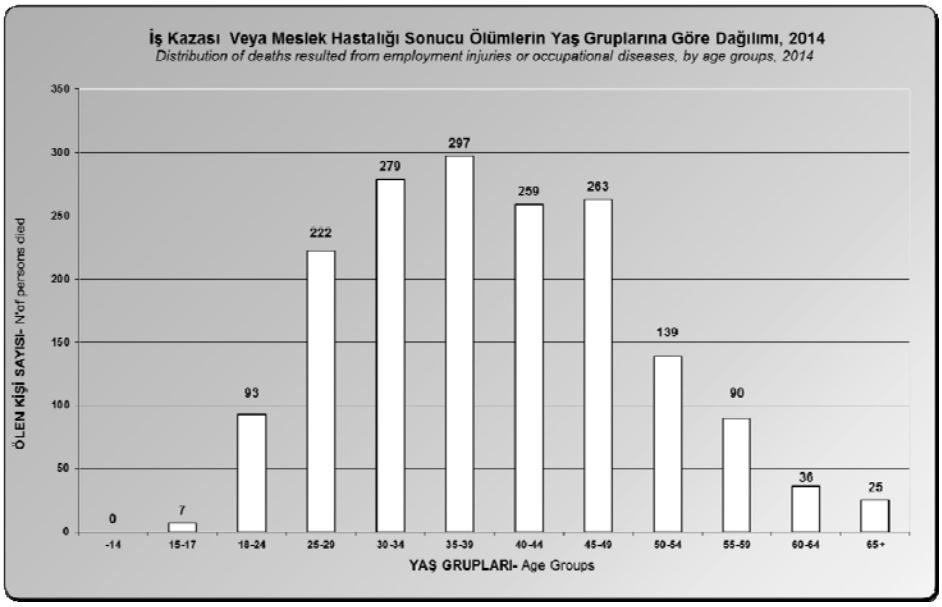

Figure 2-2 – Number of deaths by their causes, gender and age groups year 2014 (SGK Year Book, 2014)

2.8.1 Number of insured workers

Based on the data for the years 2004-2014, the number of insured workers and their percentages for mining, metal production, and construction sectors in Turkey are shown in Table 2-1.

Table 2-1 – Number of insured workers

Year	Total Turkey	%	Mining Sector	%	Metal Sector	%	Construction Sector	%
2004	6181251	100	86366	1,40	467810	7,57	752136	12,17
2005	6918605	100	97186	1,40	509339	7,36	933498	13,49
2006	7818642	100	107805	1,38	570004	7,29	1185723	15,17
2007	8505390	100	109092	1,28	628446	7,39	1247970	14,67
2008	8802989	100	114962	1,30	974199	11,07	1238888	14,07
2009	9030202	100	118626	1,31	841814	9,32	1227689	13,60
2010	10030810	100	128660	1,28	887758	8,85	1450291	14,46
2011	11.030.939	100	121342	1,01	872391	8,97	1345298	11,64
2012	11.939.620	100	122424	0,98	952312	9,31	1452893	11,43
2013	12.484.113	100	123531	0,99	992312	7,94	1567987	12,98
2014	13.240.122	100	125625	1,01	982312	8,85	1657928	13,52

When this table is examined, it was seen that there was a remarkable increase in the number of insured workers in Turkey. Insured construction workers in 2014 were increased by approximately 200% compared to that in 2004 and 46% compared to that in 2009. Construction sector had the highest employment rate (14%) compared to the other two sectors. This showed that the construction industry was one of the leading sectors in Turkey.

2.8.2 Number of occupational accidents

Based on the data for the years 2004-2014, the numbers of occupational accidents and their percentages for construction, metal and mining sectors in Turkey are given in Table 2-2 (SGK Year books, 2004-2014).

Table 2-2 – Number of occupational accidents

Year	Total Turkey	%	Mining Sector	%	Metal Sector	%	Construction Sector	%
2004	83830	100	6421	7,66	22632	27	8106	9,67
2005	73923	100	6930	9,37	20112	27,22	6480	8,77
2006	79027	100	7635	9,66	21876	27,68	7143	9,04
2007	80602	100	7218	8,96	22644	28,09	7615	9,45
2008	72963	100	6516	8,93	18118	24,83	5574	7,64
2009	64316	100	9091	14,13	16973	26,39	6877	10,69
2010	62903	100	9081	14,44	16387	26,05	6437	10,23
2011	61119	100	10351	16,94	15674	25,23	7482	11,24
2012	62124	100	10782	16,01	15673	25,02	8753	11,78
2013	65223	100	11538	15,78	15123	24,56	8954	12,56
2014	64978	100	12988	19,98	14749	23,53	8763	12,98
Average	71547	100	9567	12,09	19822	25,23	7482	11,61

Especially in the recent years, a serious decline in the number of accidents in Turkey can be seen from the table. The number of accidents in 2014 has declined by 11% compared to that in 2008 and 23% compared to that in 2004.

2.9 Cost of Accidents

Guyaguler (2000) discovered that there were two important cost factors related to accidents which were direct and indirect costs of the accidents.

The direct cost of the accidents consists of:

- Medical costs.
- Expenses payment disablement under the insurance of workers.
- Other payments for the company owner.

The indirect costs of construction accidents can be outlined as follows:

- There is lost time for injured worker.
- Lost time of the family members of the injured worker.
- Lost time and efficiency for other workers who feel empathy.
- Lost time for people who work on the office for investigating the accident and finding the cause of the accidents.
- It is also taking time for replace the injured worker and prepare the new one to work.

- Hospital expenses.
- Costs due to damage to machine, tools or other property or spoiled of material.
- Costs due to insurance payments.
- Interruption of production.
- Costs related to the injured workers efficiency and production after recovery.

Construction industry having the highest accident ratios in industry produces the highest accident costs. In order to determine the cost of the accidents, it is necessary to obtain reliable data. If there is not enough data, the statistical results will not be correct.

2.10 Effective Factors of Health and Safety in Construction

Lee and Yusmin (2012) discussed some reasons in terms of Contractor's perspective. They performed a survey on 100 construction companies in Malaysia. First part of their study was focused on the administration and supervision of the companies. Second part was related to determining the significant factors during the construction safety in work areas. The results showed that some factors such as management, process and administrations affected the workers safety.

Hanna and Hassanein (2008) performed a research on the effect of safety training programs on the safety level. They found that when the training program was better, safety level of the companies were increasing.

Skitmore et al. (2005) examined the importance of 'Safety Performance Evaluation' factors through a questionnaire that was administered in Hong Kong. The survey was conducted among clients, contractors and consultants in Hong Kong in order to set up the importance of the factors. The results indicated that the most important factors were the management and administrative commitment, followed by the health and safety training, selection and the control of subcontractors, safety review and finally the accidents record.

Huang (2006) performed a research on the role of owner of the company in safety management by selecting the safety programs and following them. Safety in the construction area was owner's responsibility and it affected all the workers. The relationship between the safety of the construction and the owner's effect were questioned with particular focus on the project context, choosing safety equipment's and the owner's contributing and control of the administration of safety. The results proved that the owner could affect the safety in projects by as much as 25%.

2.11 Domino Theory

In 1931, Heinrich et al. (1980) explained a set of theorems known as 'Domino Effect of Industrial Safety'. Their first known comment on accident causation was "the occurrence of an injury invariably results from a complicated sequence of factors, the last one of which being the accident itself."

This concept was known as the "Domino Theory" and was presenting an accident's sequence. This sequence was explained similar to line of dominos falling over one by one. The sequence was:

- Injury, caused by an;
- Accident, due to an;
- Unsafe act and/or mechanical or physical hazard, due to the;
- Fault of the person, caused by their;
- Ancestry and social environment.

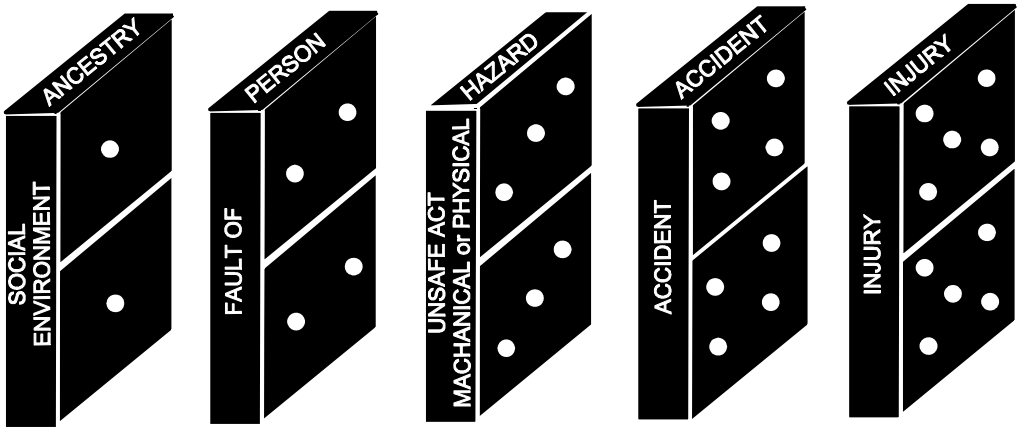

Figure 2-3 – Domino labels

According to Heinrich et al. (1980), accident could be avoided by removing one of the dominoes (middle one), normally the unsafe act. This theory proved that the accident prevention could be achieved by preventing unsafe conditions and unsafe acts.

2.12 Other Studies on Safety in Construction Industry

Deng et al. (2004) performed a research related to the construction area safety in China. They examined the effect of three factors including orders of production and operations, reputation of firms, and psychology of labors on the safety during construction. It was discovered that lack of attention from leaders, reckless actions, poor safety decisions of managers, non-certified skilled labor, and lack of emergency measure were the reasons of the accidents.

Hanna (2008) performed a study on the safety performance in the Egyptian construction industry. A questionnaire was sent to large companies in Egypt and comparisons of the safety between the contractors in United States and Egypt were performed. The results proved that the safety programs in construction companies in in USA were much more effective and efficient than the Egypt safety program. The also research showed that the social insurance for the workers would encourage the contractors to provide the workers enough attention for safety.

Chan et al. (2010) investigated the roles of the construction industry in injury costs. The objective of this study was to define the role of occupational specialist. Based on this research, it was stated that most of the large companies had some occupational health and safety specialists, but the smaller ones did not have. The results indicated that large companies had better experienced specialist and better specialist made the work place safer than others.

Based on the literature review, the factors that affect occupational safety and health of the workers in construction areas could be grouped into four as follows:

1. The role of supervision on workers.
2. The role of the administration and meetings of the Construction Company and contractor.
3. The workers' personal attitudes and their habits about health and safety.
4. The part of training programs.

3 ANALYTICAL WORK

3.1 General

A questionnaire, given in the appendix, was prepared and performed in three selected companies. The first selected company was a large construction company having many offices and workers; second company was a mid-sized company. Third company was a small company which did not have continuous work or main building.

3.2 Method of Survey

Questionnaires are typically used to study a condition or to estimate the dispersion of characteristics in a population. Preparation of the questionnaire is one of the most important stages in the survey development process.

The preparation of a questionnaire needs common sense and survey maker should be customary with some of the characteristics of the survey. The aim of the survey shall be defined in details to the people filling out the surveys. This has a major impact on how the questionnaire is answered. It is possible to measure the right audience by starting the questionnaire with appropriate modified questions that filter out respondents who are not a part of the aimed audience. In this study, the construction workers and engineers were informed in details.

3.3 Description of Survey

The prepared questionnaire is shown in Appendix. The survey consisted of 32 questions. The questionnaire had three parts. The first and second parts were answered by filling the blanks. The third part of survey had “Yes” or “No” answers.

The first part consisted of general information about the company, including name of company, annual turnover, number of employees, etc. This first part was filled by the researcher after getting enough information related to the company. This information

was confidential for the companies; therefore it was not shared with workers and employees who answered the survey.

Second part consisted of general information related to the workers, including name of worker, position in company, and work experience. This and the third part were answered by workers.

The third part having twenty six questions is intended to collect the detailed information about the safety material, equipment, procedures, and the perceptions of the workers related to the occupational safety.

Some questions were asked to the workers and some of them were asked to the people who work for administration. Eight questions (between 1-4 and 23-26) were asked to the administration and other eighteen (between 5 and 22) were asked to the workers.

Questions in the survey were related to four major factors:

1. The impact of the management on the safety during construction process (questions between 10-14),
2. The personal ideas of the workers related to health and safety (questions between 15-22),
3. The role of administration and meetings (questions between 1-4, 23-26), and
4. The role of training program in the company for improving health and safety issues (questions between 5-9).

The survey results were evaluated based on the following scale shown in Table 3-1.

Table 3-1 – Evaluation of safety level

Percentage	Category
Safety level ≥ 60%	Higher Safety level.
60% ≥ Safety Level ≥ 30%	Acceptable Safety level.
30% ≥ Safety Level	Not acceptable Safety level.

Past researches and works showed that safety level under 30% in not acceptable (Skitmore et al., 2005 and UCTEA, 2012)

In this research, the relation between these four factors and relationship of the factors with the size and age of the company and the safety level were evaluated.

3.4 Respondent Companies

First company (Company X) was a very famous and old company in the construction sector in Turkey. It had experience approximately more than 40 years. This company constructed more than five large projects per year and its annual turnover was approximately more than 5,000,000 TL. Company X had more than 100 worker and respondent workers were reinforcement workers, formwork workers and plaster workers.

The second company (Company Y) was a moderate company. It had 10-20 years of experience. Numbers of annual projects were between 2-5 middle scale projects and its annual turnover was between 500,000 TL - 5,000,000 TL. Company Y had number of worker between 50 and 100 and respondent workers were reinforcement workers, formwork workers and plaster workers.

The third company (Company Z) was small and new. It had experience between 0 and 5 years. The number of annual projects was less than two small scale projects and its annual turnover was less than 100,000 TL. Company Z had less than 50 workers. This company was an insulation company so all workers are insulation worker.

This survey was applied to 35 workers for each company. The total research consisted of the results of 105 respondent's answers. The questions of the survey were answered in a relaxed and worry free environment by the workers. The questions were explained to the workers in details. The misunderstandings of the questions were minimized. The survey was performed to the workers somewhere outside the construction site after the work hours. This eliminated the worries of the workers related to their answers affecting their jobs.

4 RESULTS AND DISCUSSION

4.1 Introduction

This chapter of the study includes the results of the questionnaire. The results are represented in tables and pie charts. Questionnaire results were collected in four months. Therefore, these results were harmonious with the general impression toward the levels of occupational security and health in the construction industry. This relevance was also noticed by the ones who helped the researcher in deploying this questionnaire.

Occupational safety and health of workers in the construction industry is related to mainly four major factors:

- Training programs
- Supervision on workers
- Personal attitudes and habits of the workers
- Administration and meetings of the company

First major factor is the Training Program. The company has to perform training programs to the workers to improve their skills on how to use the personal protective equipment, fire protection equipment, how to deal with the risks and the dangers to follow the emergency procedures in case of a need. The company is responsible to have regular training programs for safety and health, and training program for the new workers of the company.

The second major factor is related to the supervision on workers. Managers at the worksites are also responsible to control whether the workers use the safety equipment like, eye protection, rubber boots, helmets and safety belts or not. They have to provide a special attention to the new workers for the equipment by training them and providing them with the necessary information related to the health and safety in construction industry.

The third major factor is the personal attitudes and habits of the workers related to their own health and safety. Topics such as how they deal with the dangers and the risks during the work are included in this factor. These attitudes basically depend on the environment and the society which the worker is from. All of these affect his psychological situation. For example, some workers prefer and feel uneasy to work in unsafe environment, other workers may see it necessary to take risks in order to finish the work rapidly.

The fourth major factor is related to the administration and meetings of the company. This part was asked directly to the managers or people who are working in the office like engineers or architectures, etc. These people were asked about regular meetings and their effectiveness, accident records and weekly control on safety equipment.

4.2 Analysis of the Results

Each of the four major factors was measured through some direct questions. The analyses of these factors are presented below.

4.2.1 Analysis of First Factor

The analysis of first major factor for all the companies is shown in Table 4-1.

Table 4-1 – Analysis of the first factor for all companies

	Name of Company	Q-5		Q-6		Q-7		Q-8		Q-9		Total Percentage	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Training Program	X	28	2	21	9	21	9	12	18	20	10	68%	32%
	Y	15	15	19	11	12	18	10	20	8	22	43%	57%
	Z	9	21	4	26	9	21	5	25	3	27	20%	80%

The graph related to the percentage of the first factor for Company X is shown in Figure 4-1. These results show that, the level of training program for Company X is evaluated by 68% according to the regularity and effectiveness of the trainings which indicates that the trainings are available and effective. Based on Table 3-1, this percentage is quite high and it does prove that there is professional level of training applied for Company X.

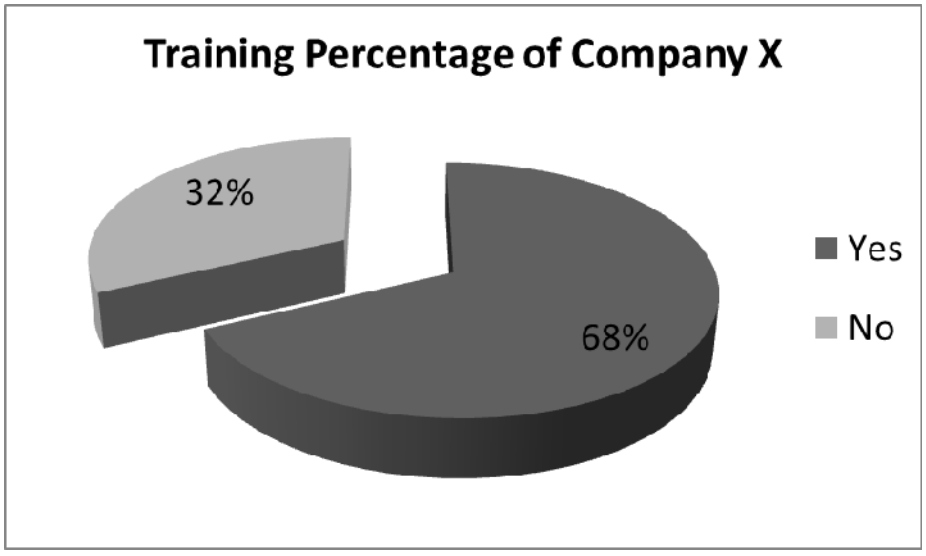

Figure 4-1 – Percentage of the first factor for Company X

The graph related to the percentage of the first factor for Company Y is shown in Figure 4-2. These results show that, the level of training program for Company Y is evaluated by 43% according to the regularity and effectiveness of the trainings. The results indicate that the level of safety evaluation has almost acceptable percentage but still requires more development, based on Table 3-1. Training programs seems to be weak and should be improved.

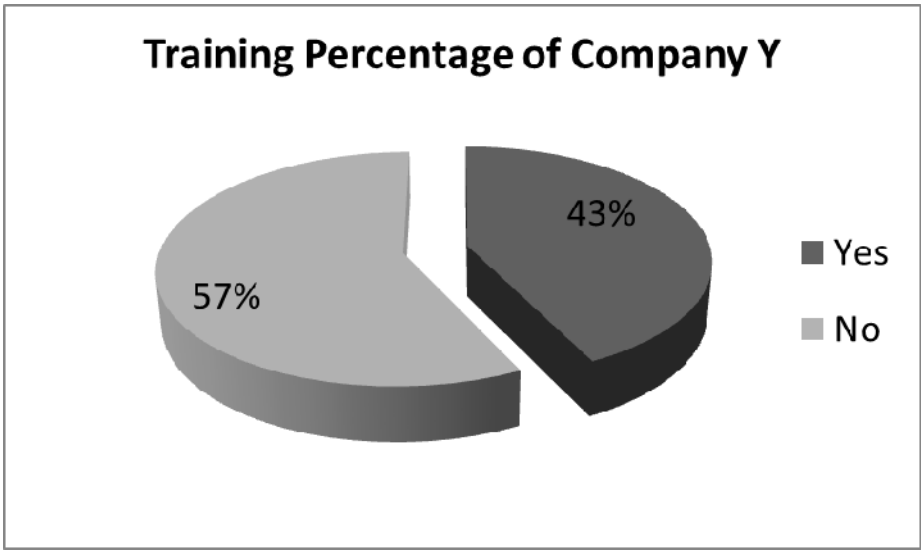

Figure 4-2 – Percentage of the first factor for Company Y

The graph related to the percentage of the first factor for Company Z is shown in Figure 4-3. These results show that, the level of training program for Company Z is evaluated by 20% according to the regularity and effectiveness of the trainings. The results indicate that the level of safety training programs is low based on Table 3-1. Percentage of training program is not acceptable and must be improved immediately.

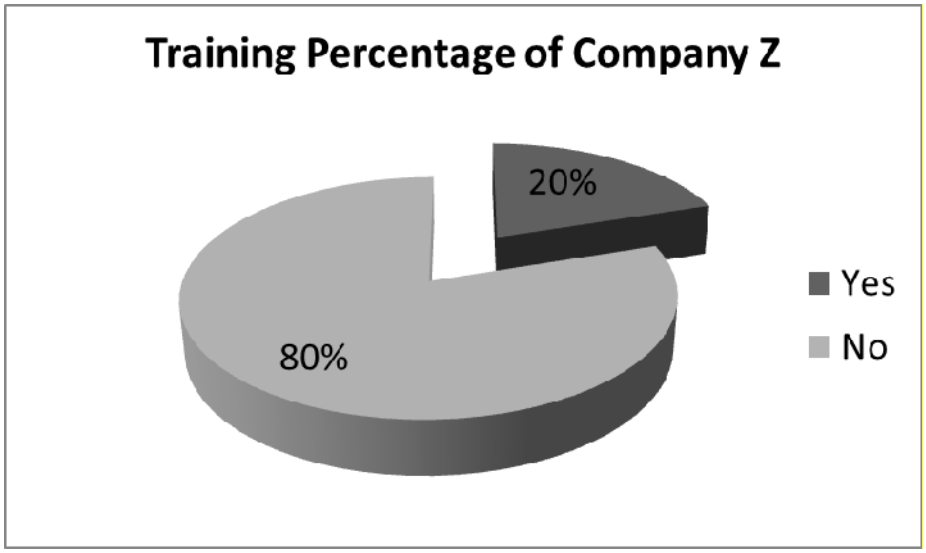

Figure 4-3 – Percentage of the first factor for Company Z

4.2.2 Analysis of Second Factor

The analysis of second major factor for all the companies is shown in Table 4-2.

Table 4-2 – Analysis of the second factor for all companies

	Name of Company	Q-10		Q-11		Q-12		Q-13		Q-14		Total Percentage	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Supervision on Workers	X	20	10	21	9	23	7	18	12	28	2	73%	27%
	Y	8	22	15	15	12	18	15	15	12	18	41%	59%
	Z	4	26	10	20	12	18	3	27	9	21	25%	75%

The graph related to the percentage of the second factor for Company X is shown in Figure 4-4. The second major factor which shows the results of the supervision on the workers related to the safety and measures the perception of workers for Company X is 73%. It means that there is high level of awareness related to the working conditions.

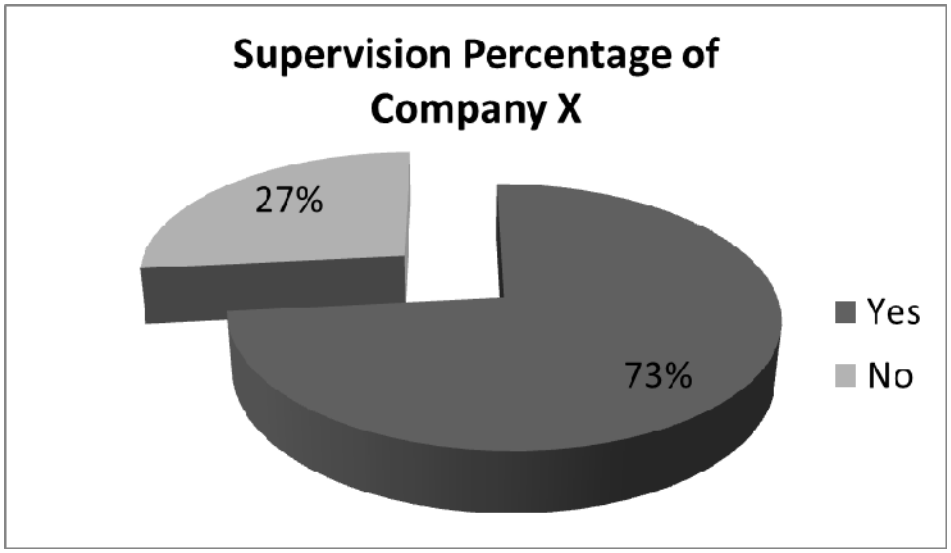

Figure 4-4 – Percentage of the second factor for Company X

The graph related to the percentage of the second factor for Company Y is shown in Figure 4-5. The second major factor which shows the results of the supervision on the workers related to the safety and measures the perception of workers for Company Y is 41%. This percentage is fairly acceptable but it also clarifies that the workers need to be paying more attention and awareness related to the importance of safety.

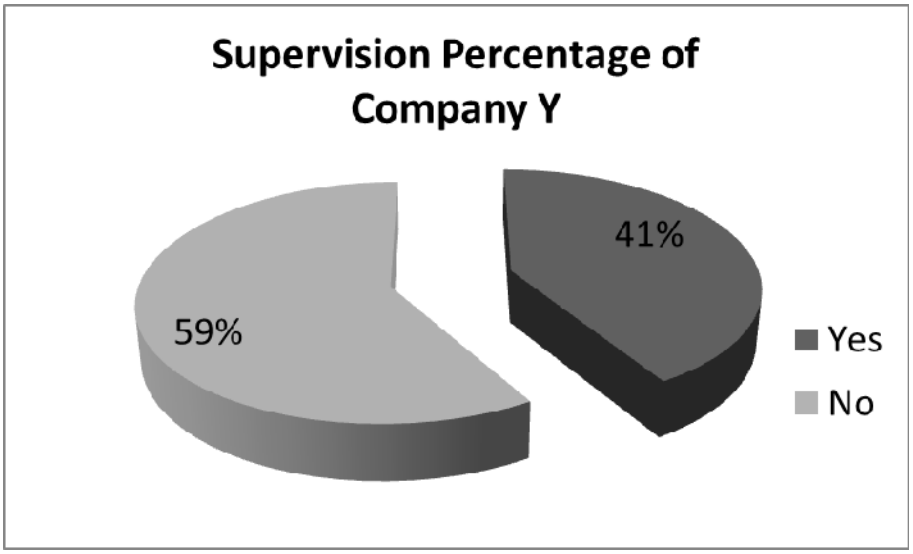

Figure 4-5 – Percentage of the second factor for Company Y

The graph related to the percentage of the second factor for Company Z is shown in Figure 4-6. The second major factor which shows the results of the supervision on the workers related to the safety and measures the perception of workers for Company Z is 25%. This percentage is really low compared to the other companies, so workers must keep level of awareness high related to the importance of safety.

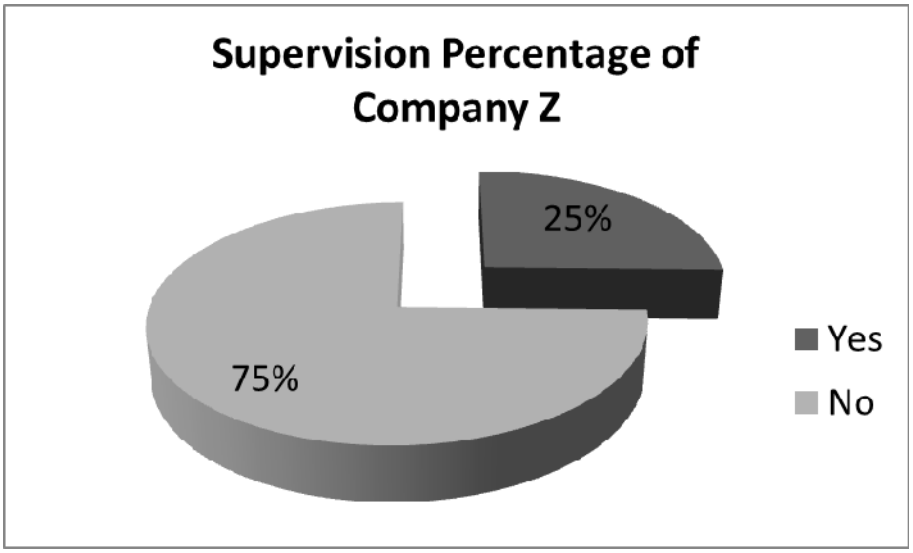

Figure 4-6 – Percentage of the second factor for Company Z

4.2.3 The Analysis of the Third Factor

The analysis of third major factor for all the companies is shown in Table 4-3.

Table 4-3 – Analysis of the third factor for all companies

Personal Attitudes and Habits of Workers	Name of Company	Q-15		Q-16		Q-17		Q-18		Q-19		Q-20		Q-21		Q-22		Total Percentage	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	X	2	28	28	2	17	13	19	11	24	6	22	8	8	22	22	8	59%	41%
	Y	4	26	24	6	12	18	9	21	16	14	16	14	9	21	8	22	41%	59%
	Z	6	24	20	10	10	20	9	21	13	17	15	15	6	24	7	23	36%	64%

The graph related to the percentage of the third factor for Company X is shown in Figure 4-7. The third major factor which shows the results of the personal attitudes on workers related to the safety and measures the perception of workers for Company X is 59%. This result shows that the company has interest related to improving their awareness for working conditions.

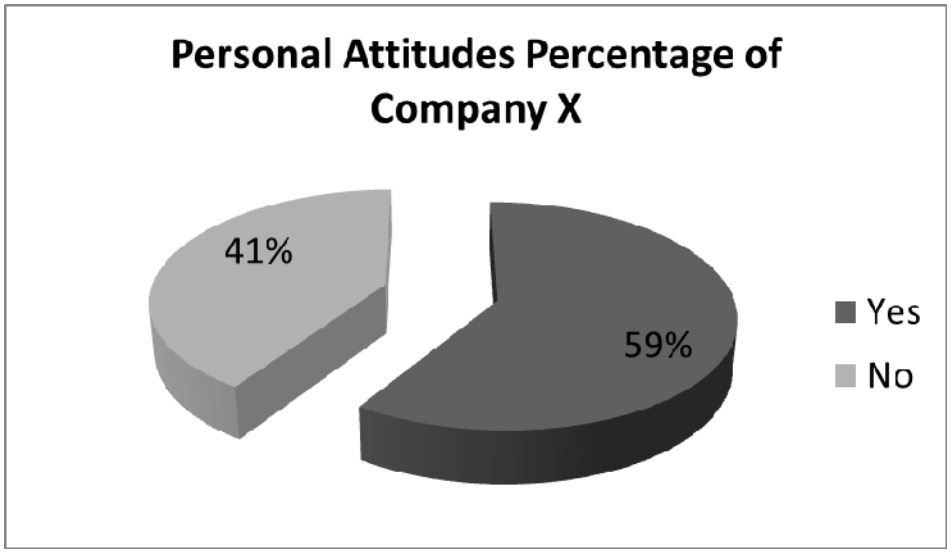

Figure 4-7 – Percentage of the third factor for Company X

The graph related to the percentage of the third factor for Company Y is shown in Figure 4-8. The third major factor which shows the results of the personal attitudes on workers related to the safety and measures the perception of workers for Company Y is 41%. Based on Table 3-1, this percentage is acceptable and workers should keep their awareness related the importance of safety.

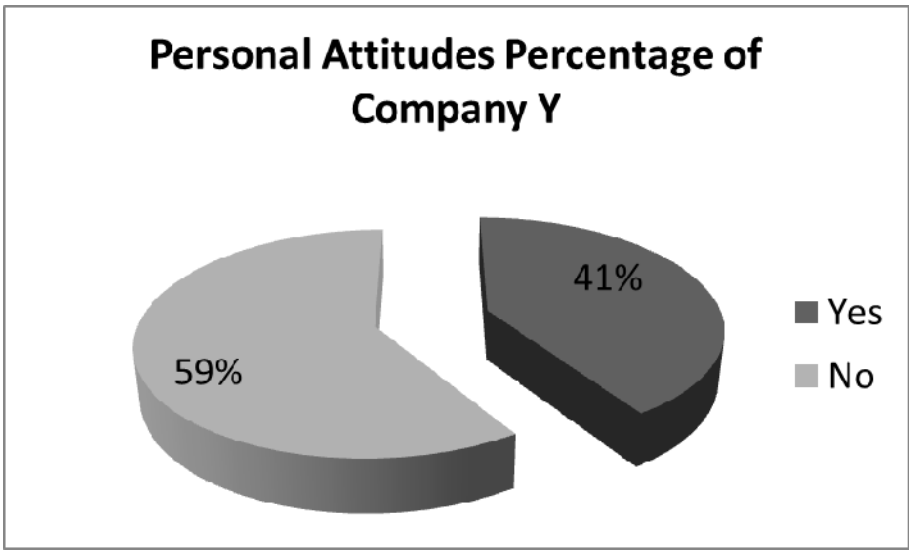

Figure 4-8 – Percentage of the third factor for Company Y

The graph related to the percentage of the third factor for Company Z is shown in Figure 4-9. The third major factor which shows the results of the personal attitudes

on workers related to the safety and measures the perception of workers for Company Z is 36%. This percentage indicates that the workers opinion on working environment is unsafe, there is risk need to be reduced and the company must be interested in improving their own awareness.

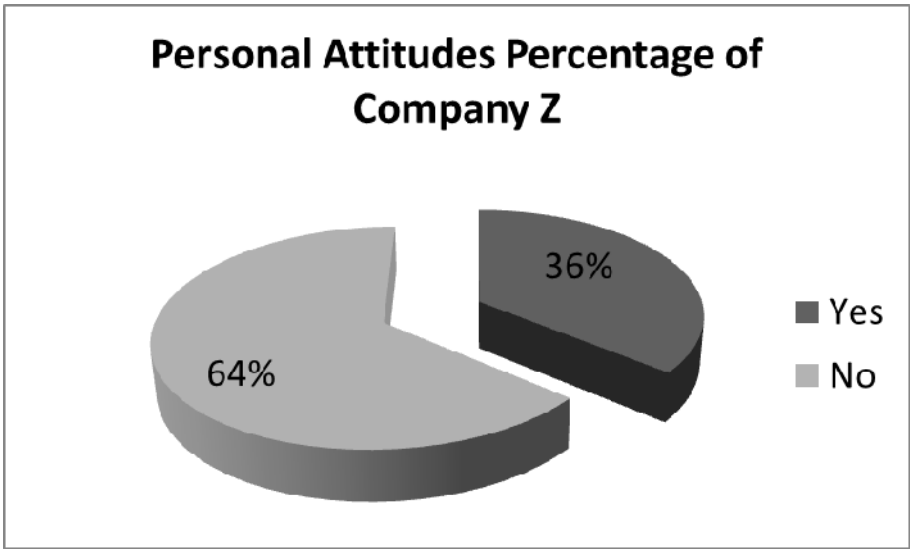

Figure 4-9 – Percentage of the third factor for Company Z

4.2.4 The Analysis of the Fourth Factor

The analysis of fourth major factor for all the companies is shown in Table 4-4.

Table 4-4 – Analysis of the fourth factor for all companies

Administration and Meetings	Name of Company	Q-1		Q-2		Q-3		Q-4		Q-23		Q-24		Q-25		Q-26		Total Percentage	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	X	5	0	3	2	3	2	3	2	4	1	5	0	4	1	4	1	77%	23%
	Y	1	4	1	4	2	3	2	3	3	2	3	2	4	1	3	2	47%	53%
	Z	1	4	2	3	2	3	2	3	2	3	1	4	2	3	1	4	32%	68%

The graph related to the percentage of the fourth factor for Company X is shown in Figure 4-10. The fourth major factor which shows the results of the administration and meetings of the company for Company X is 77%. This percentage is extremely high which denotes that the level of administration is acceptable for Company X.

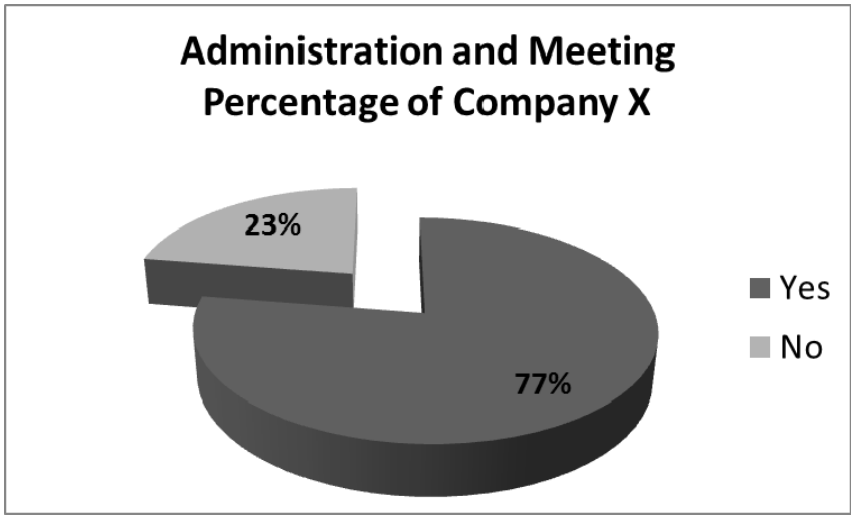

Figure 4-10 – Percentage of the fourth factor for Company X

The graph related to the percentage of the fourth factor for Company Y is shown in Figure 4-11. The fourth major factor which shows the results of the administration and meetings of the company for Company Y is 47%. Based on Table 3-1, the level of administration and meetings seems to be weak and should be improved, while the evaluation of the meetings has almost acceptable percentage but still requires more development.

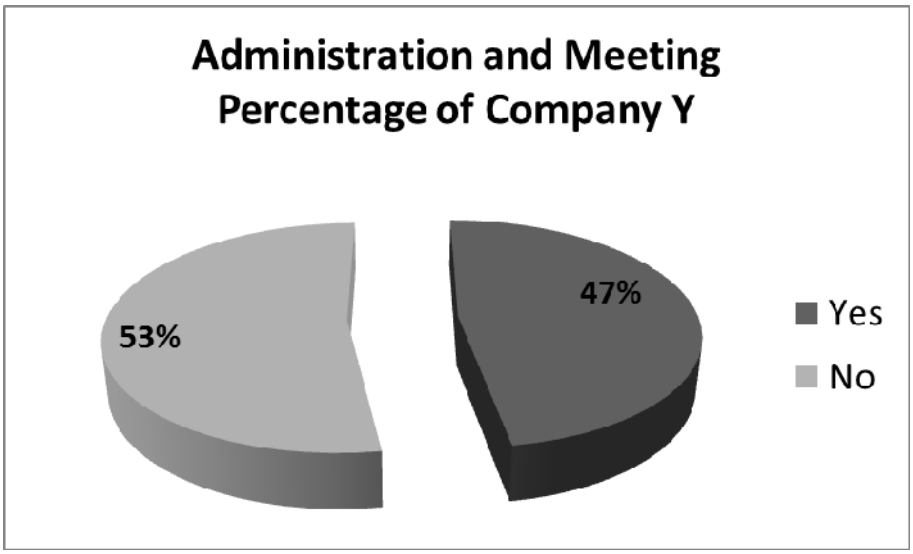

Figure 4-11 – Percentage of the fourth factor for Company Y

The graph related to the percentage of the fourth factor for Company Z is shown in Figure 4-12. The fourth major factor which shows the results of the administration and meetings of the company for Company Z is 32%. Based on Table 3-1, the level of administration and meetings is low. Percentage of administration and meetings is not acceptable and must improve immediately.

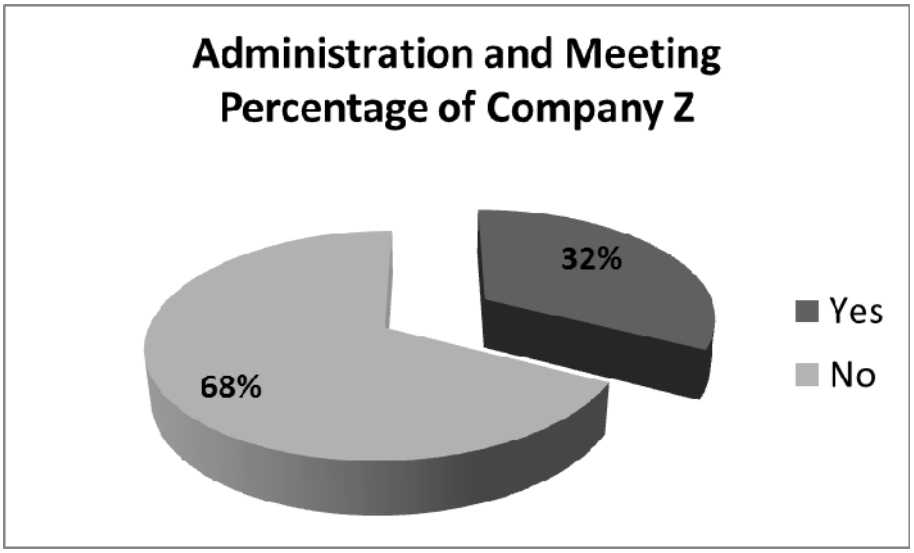

Figure 4-12 – Percentage of the fourth factor for Company Z

4.3 Relationship between Project Size and Safety of Workers

The relation between major factors and the project size for all companies is shown in Table 4-5.

Table 4-5 – Relation between major factors and project size

		F1*			F2*			F3*			F4*			Total Percentage	
Name Of Company	Number Of Employee	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
X	More than 100	102	48	68%	110	40	73%	142	98	59%	31	9	77%	66%	34%
Y	Between 50 and 100	64	86	43%	62	88	41%	98	142	41%	19	21	47%	42%	58%
Z	Less Than 50	30	120	20%	38	112	25%	86	154	36%	13	27	32%	29%	71%

* F1 is the Training Program Factor, F2 is the Supervision on Workers Factor, F3 is the Personal Attitudes Factor, and F4 is the Administration and Meetings Factor.

The results of this study indicated that there is a relationship between the size of the project and the safety performance. Large projects had higher level of safety than that of the small projects.

The percentages of four factors for each company are shown in Figure 4-13. More affirmative answers were given by the company who had more than fifty workers that the other companies. Therefore, it can be concluded that large companies had the occupational health and safety culture better than the smaller ones had.

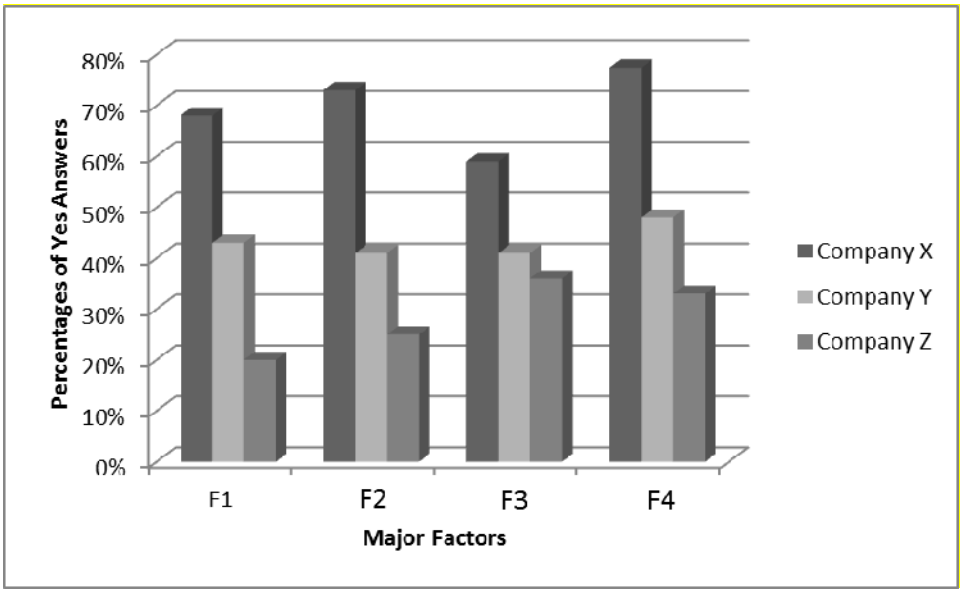

Figure 4-13 – Each of four major factors and project size

4.4 Relationship between Experience and the Safety of Workers

The relationship between the major factors and the project size for all companies is shown in Table 4-6.

Table 4-6 – Relation between major factors and experience of worker

Name Of Company	Experience	Number Of Employee	F1 - (5)			F2 - (5)			F3 - (8)			F4 - (8)			Total Percentage	
			YES	NO	*%Yes*	YES	NO	*%Yes*	YES	NO	*%Yes*	YES	NO	*%Yes*	YES	NO
X	Less than 5 Year	9	22	13	62,86%	23	12	65,71%	35	21	62,50%	10	6	62,50%	63%	37%
X	5 -- 10 Year	10	27	23	54,00%	26	24	52,00%	45	35	56,25%	0	0	0,00%	54%	46%
X	10 -- 20 Year	9	20	20	50,00%	18	22	45,00%	30	34	46,88%	4	4	50,00%	47%	53%
X	More than 20 year	7	13	12	52,00%	14	11	56,00%	24	16	60,00%	9	7	56,25%	56%	44%
Y	Less than 5 Year	9	21	19	52,50%	22	18	55,00%	30	34	46,88%	4	4	50,00%	51%	49%
Y	5 -- 10 Year	8	14	26	35,00%	12	28	30,00%	25	39	39,06%	0	0	0,00%	35%	65%
Y	10 -- 20 Year	11	25	25	50,00%	20	30	40,00%	36	44	45,00%	3	5	37,50%	45%	55%
Y	More than 20 year	7	15	10	60,00%	16	9	64,00%	22	18	55,00%	7	9	43,75%	57%	46%
Z	Less than 5 Year	10	19	26	42,22%	20	25	44,44%	33	39	45,83%	3	5	37,50%	44%	56%
Z	5 -- 10 Year	13	25	25	50,00%	22	28	44,00%	25	55	31,25%	10	14	41,67%	40%	60%
Z	10 -- 20 Year	8	15	20	42,86%	14	21	40,00%	22	34	39,29%	2	6	25,00%	40%	60%
Z	More than 20 year	4	8	12	40,00%	9	11	45,00%	15	17	46,88%	0	0	0,00%	44%	56%

Numbers of “Yes” answers of the workers in the companies are shown in Figure 4-14 to Figure 4-25. Results were grouped for every major factor. These figures indicated that all the companies have similar types of graphs. All graphs had more "Yes" answers at the beginning, little less at middle and again "Yes" answers increased at the end. Workers who had less than 5 years of experience and more than 20 years of experience had more "Yes" answer than the others. These results indicated that workers younger than age 20 and older than age 45 were all have more interest about safety procedure than others.

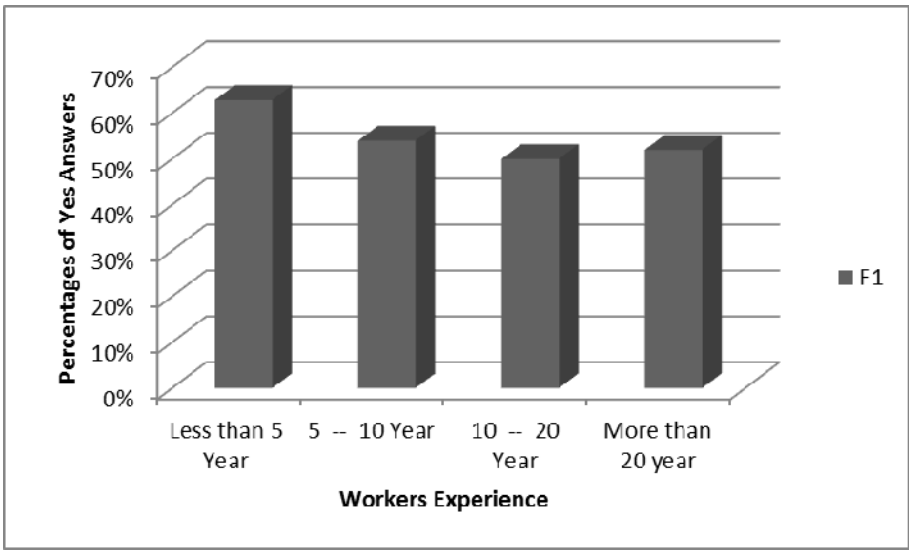

Figure 4-14 – Percentages of first major factor for Company X

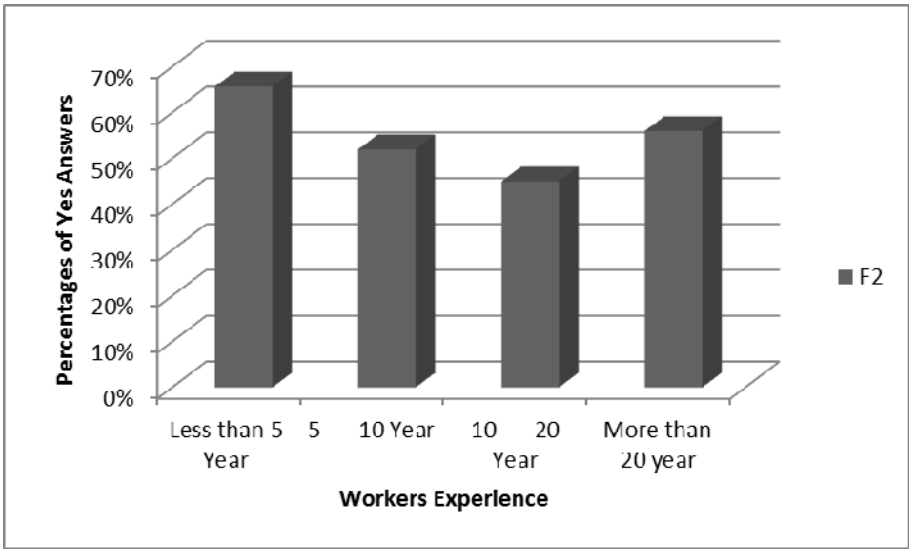

Figure 4-15 – Percentages of second major factor for Company X

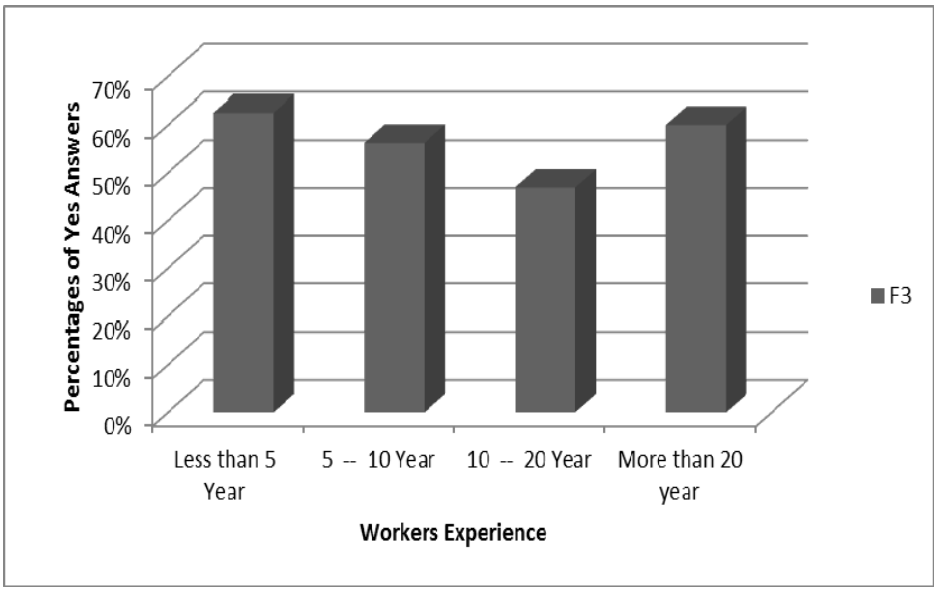

Figure 4-16 – Percentages of third major factor for Company X

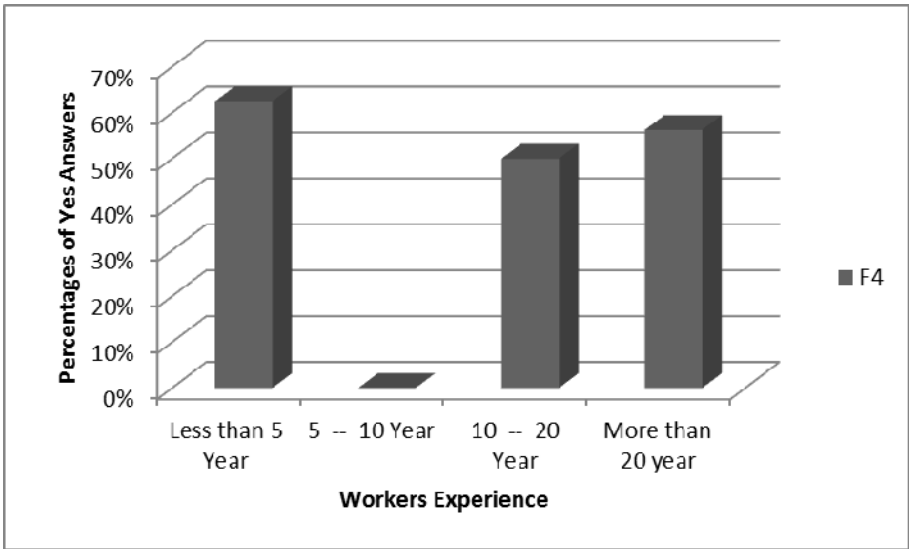

Figure 4-17 – Percentages of fourth major factor for Company X

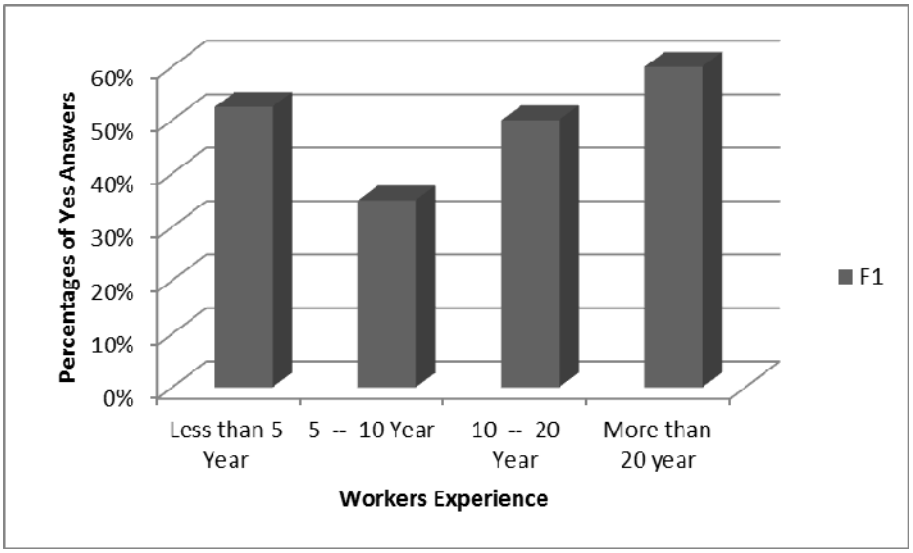

Figure 4-18 – Percentages of first major factor for Company Y

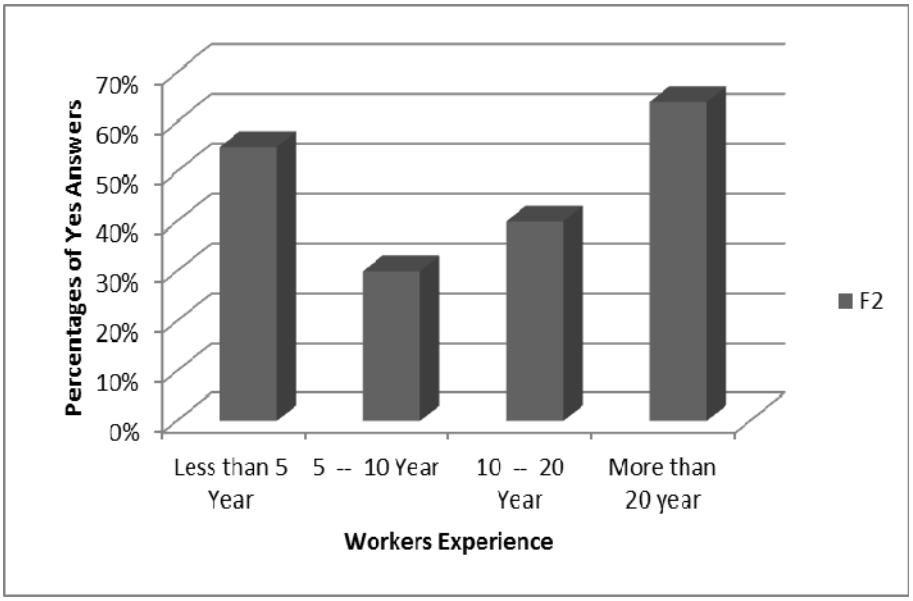

Figure 4-19 – Percentages of second major factor for Company Y

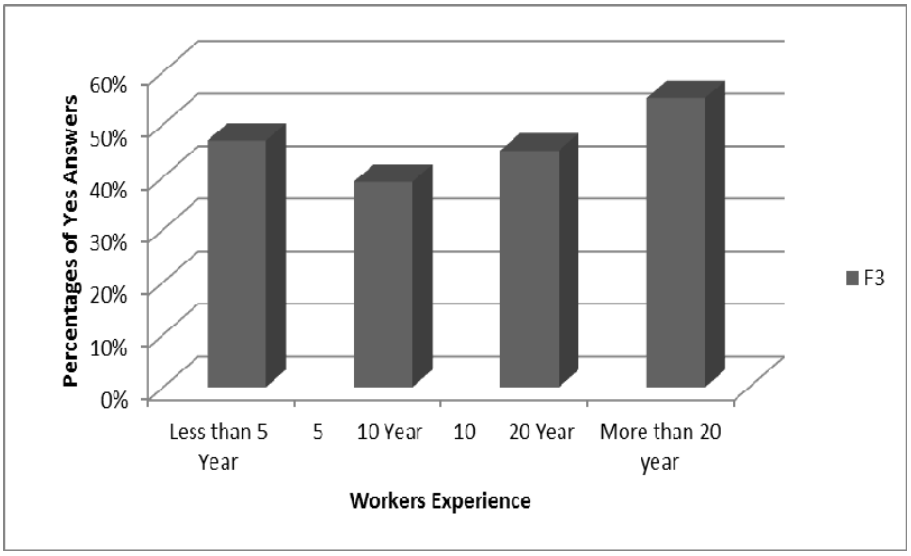

Figure 4-20 – Percentages of third major factor for Company Y

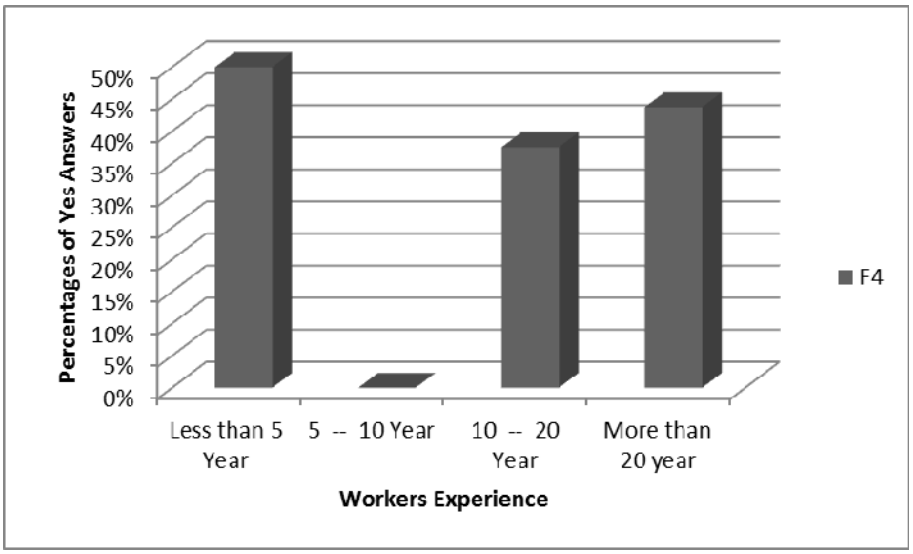

Figure 4-21 – Percentages of fourth major factor for Company Y

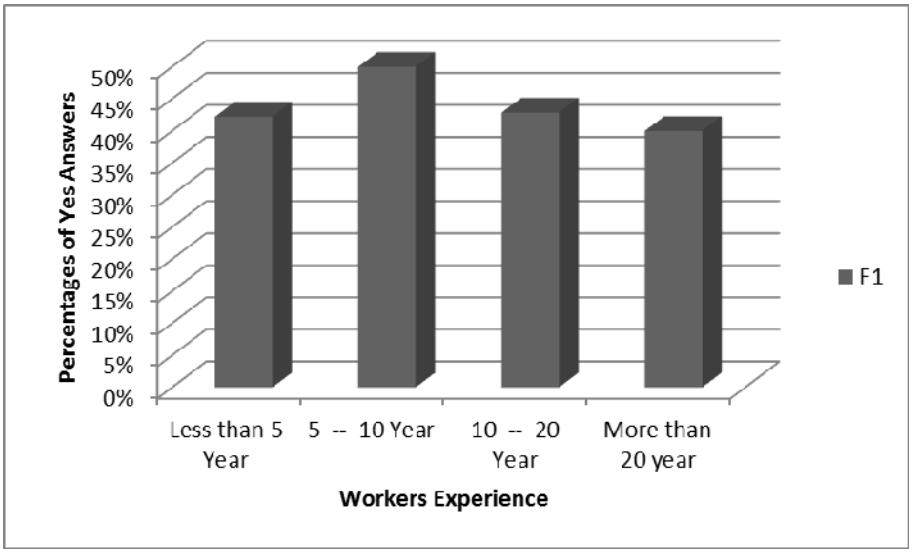

Figure 4-22 – Percentages of first major factor for Company Z

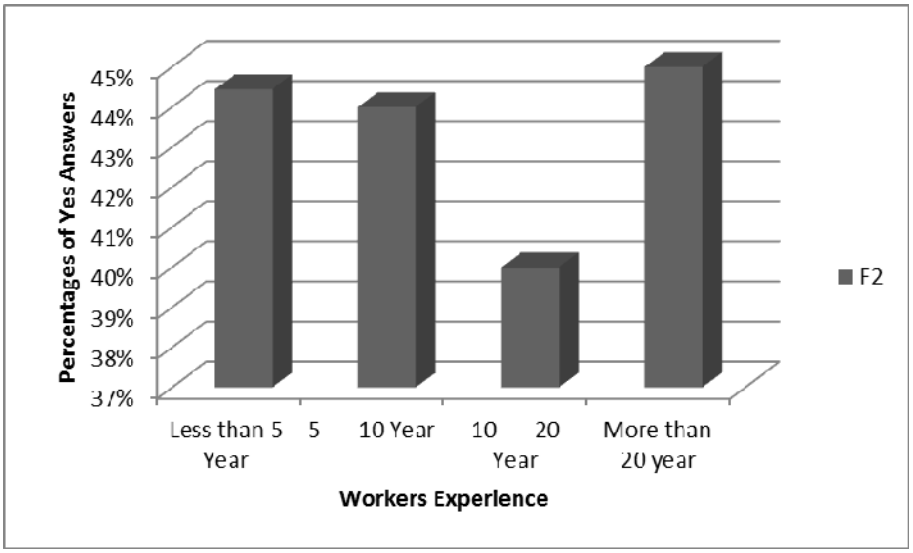

Figure 4-23 – Percentages of second major factor for Company Z

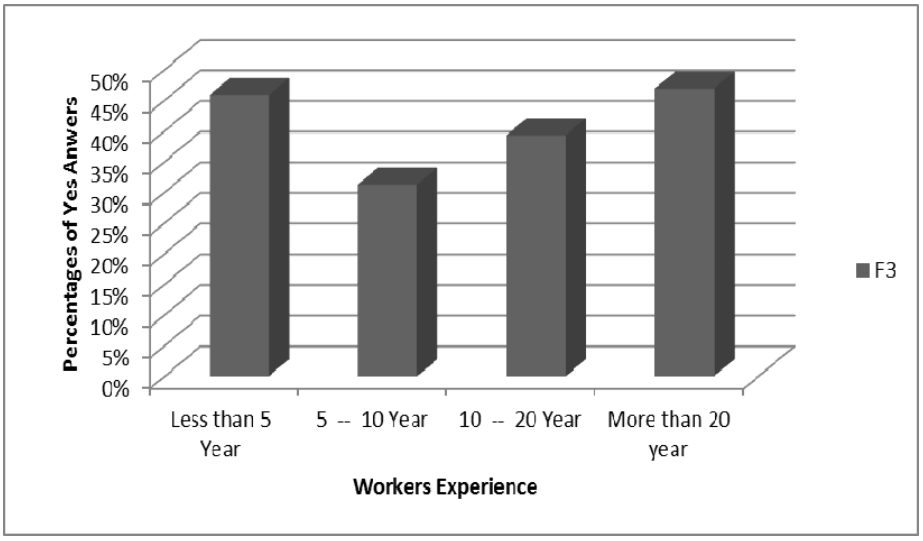

Figure 4-24 – Percentages of third major factor for Company Z

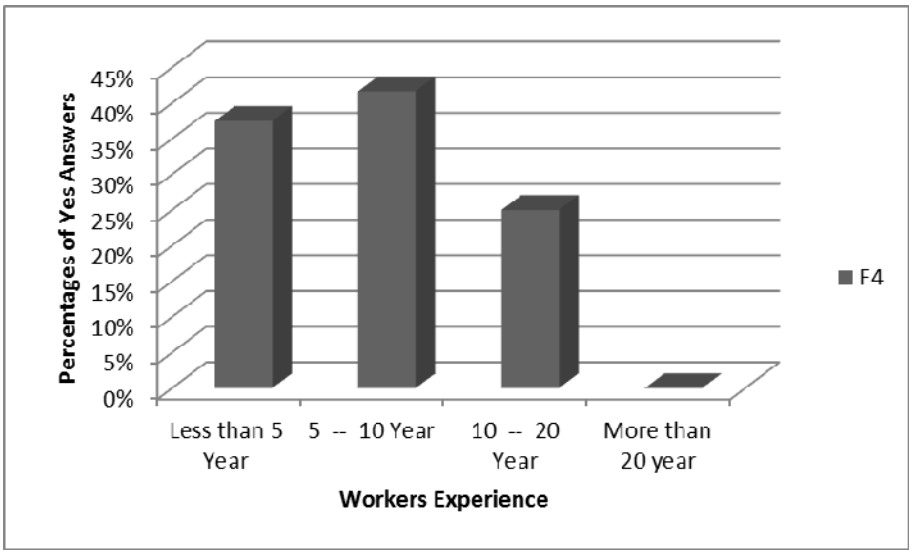

Figure 4-25 – Percentages of fourth major factor for Company Z

4.5 Discussion

The percentages of safety factors for Company X, Company Y, and Company Z are shown in Figure 4-26.

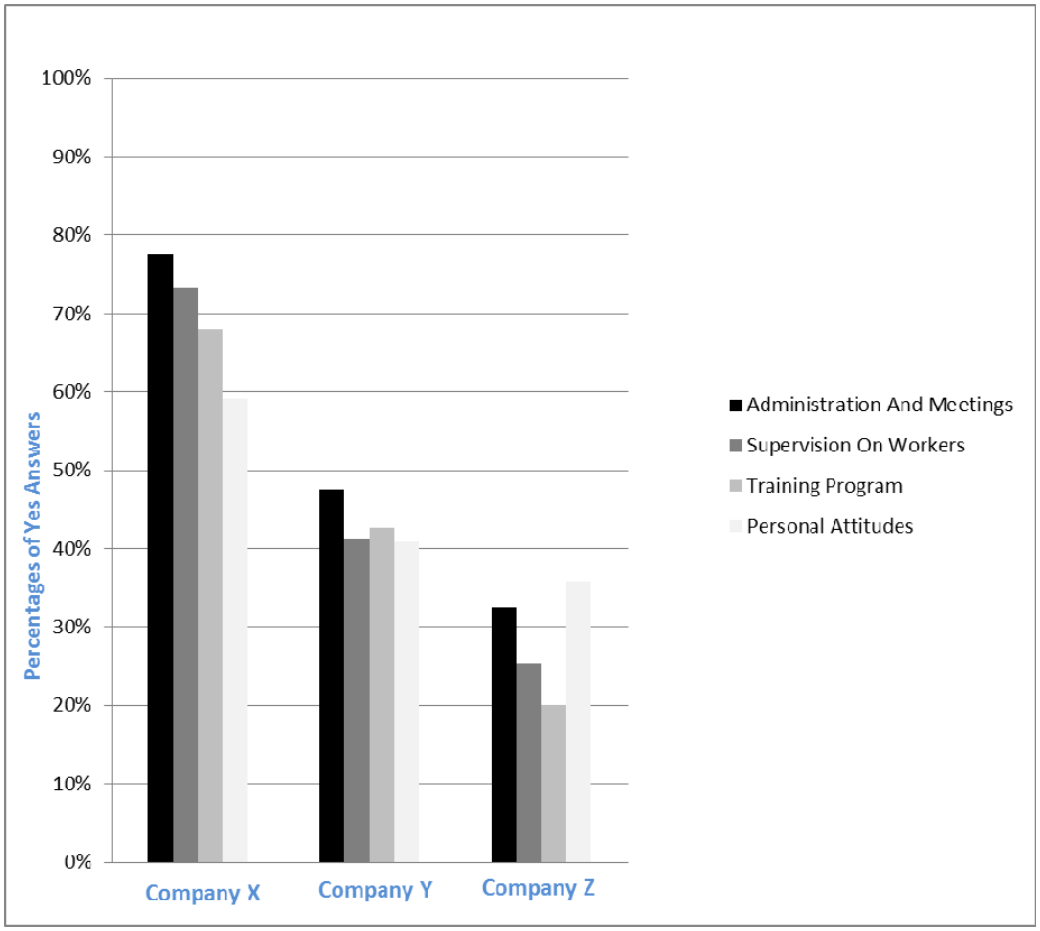

Figure 4-26 – Four major factors percentages for all companies

The results indicated that safety had a relationship with the size of the project and experience of the company. Therefore, it can be concluded that when the size and the experience of the company increased, the occupational safety of the company would also increase.

Considering the four factors, the average value of the occupational safety for the three companies was 52,3%. It was acceptable for a developing country (60% ≥ Safety Level ≥ 30% Acceptable Safety level), (Skitmore et al. 2005; UCTEA, 2012).

Many of the companies (especially the small ones) did not have health and safety service so they did not consider this as important. Human resources departments of most of the companies were interested in the salaries and attendance of the workers more than the safety of the workers.

Based on the observations of the researcher of this thesis, cultural behaviors affected the workers' attitudes related to the safety procedures. Many of the workers were not interested in improving their safety skills and did not try to make their awareness better related to safety because they did not want to change some of their habits.

Based on the results of the survey, construction workers in Ankara had not enough degree of risk awareness and self-rated competence, and a relatively moderate degree of safety awareness.

Some reasons why the low percentage of safety meetings according to the workers during the personal interview are explained below:

1. Lots of workers do not join the safety meetings (based on the attendance records of the safety meetings).
2. The number of workers increases day by day and managers find it hard to organize them (based on the informal meetings with the managers during site visit).
3. Ordinary safety meetings makes the workers bored and this decreases the effectiveness of these safety meetings (based on the informal meetings with the workers during site visit).

The results of this research showed that the administration of the company had a direct effect on the safety level. When the high costs related to adding safety offices, engaging safety specialists, the social insurance, etc. are considered, the reasons why company administrations mostly did not prefer to take safety precaution might be explained.

4.6 Comparison of the Results with a Similar Survey Performed in Kingdom of Saudi Arabia

Ashraf (2013) performed a research related to construction safety in Kingdom of Saudi Arabia. A survey was prepared with 33 questions consisting of two parts. The first part, consisting of 11 questions, was related to some data about company and workers; it contains experience and name of the company. The second part contained

20 questions related to equipment and procedures. The survey had some factors evaluated by “Yes” or “No” answers and based on percentages from 0 to 100 for five selections.

Some of the questions in the survey were related to three major factors, (1) the influence of the management on the safety during construction process, (2) the personal ideas of the workers about health and safety and (3) the role of human resources office in the company in improving health and safety issues. This research tried to clarify the relationship between these three factors.

The survey was performed on six companies. The first three companies were small and new, established in the last 0 to 5 years having the number of annual projects less than five. The second three companies were large and old, established more than 20 years ago and having the number of annual projects more than five.

The results of the survey were evaluated for each major factor as shown in Figure 4-27. Based on this figure, the average of the safety percentages for the six companies was 66,4% for these three factors. The results of this study are also shown in Figure 4-26.

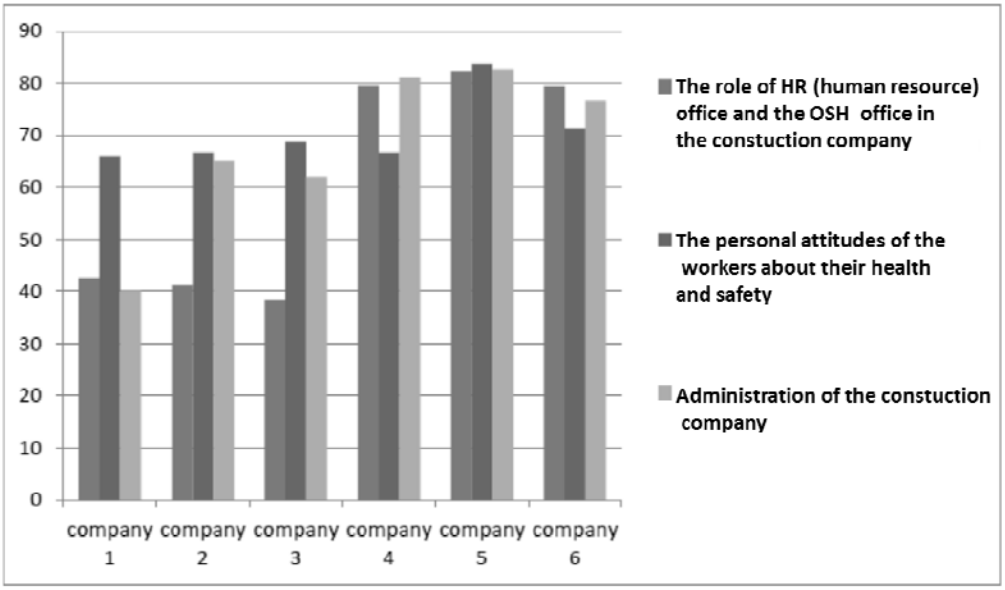

Figure 4-27 – Percentages of the three factors for the six companies in Kingdom of Saudi Arabia

So, it was noticed that the safety had a relationship with the size of the project and the experience of the company. This relationship stated that when the size and the experience of the company increased, the safety would increase. The comparisons showed that large companies had better occupational health and safety culture than small ones had for both Turkey and Kingdom of Saudi Arabia.

5 SUMMARY AND CONCLUSIONS

5.1 Summary

Health and safety in the construction sector is an important issue since many construction related accidents results in injured workers and life losses. There are many efforts trying to improve the condition of the health and safety in workplaces. These efforts include better supervision of the workers, more effective administration and meetings, enhanced worker attitudes, and more useful training programs.

Occupational accidents and injuries lead to serious problems in Turkey and in many other countries. The outcome of occupational accidents can be divided into two categories; economic and social costs. As a result of occupational accidents, permanent disabilities and deaths may occur. The permanent disability of a worker leads to social, economic and psychological problems.

The health and safety of the construction sector was evaluated in this research using a survey performed to the company administration and workers. Total of three companies (large, medium and small scale) were selected and a survey was completed face to face.

5.2 Conclusions

The observations and conclusions are as follows:

- There were various problems related to the safety and health of workers in the construction sector in Turkey that should be improved.
- The safety and health in construction in this region was effected by four significant factors which include the administration, training, personal attitudes and the supervision.
- The administrations of construction companies didn't produce persuasive programs in their management and strategic plans and didn't allocate enough proportion of the budgets to reach the required levels of safety and health within their companies.

- Supervision in these companies was not effective in health and safety meeting, training programs for safety, personal protective equipment such as helmets, safety belts, etc.
- Personal attitudes perceptions of those workers showed that they were more excited when performing their works without safety.
- The attitudes of many workers were wrong. Some of these attitudes were the wrong understanding of the fate and religious ideas which must have positive effects on the behavior of the workers. Many of the workers, when they were asked about the reason why didn't follow the safety procedures, answered as "My life is in God's hand". These ideas were false understanding of fate. This issue may be solved by punish the workers by reducing their salaries. It may mean (in Turkey), less money for more life. Because workers in Turkey care about their money more than their life.

5.3 Recommendations

We all need to ask ourselves one main question: "Are we as safe as we think?" There are three sub-questions under this title.

First question is "How could I get hurt at work?" Workers have responsibility for staying safe by: looking for hazards everywhere, reporting hazards to a supervisor. Employer has a role to play for workers safety by: providing trainings, pointing out hazards, developing safe work procedures.

Second question is "Do I have a say in my workplace safety?" Workers need to participate in their work place safety by: asking questions, talking about safety, bringing their suggestions to his supervisors.

Third question is "When do I say no?" Workers mostly worried about saying no to their managers because of getting trouble with them. So there is some other ways to say no like: "I don't feel comfortable doing this," or "Is there a safer way to do this."

It is very important for the companies that, administrators should spend enough budgets for health and safety costs. Also the workers in such companies must have

social insurance which will make the companies more cautious and install more safety equipment.

That can be choose for the companies which have occupational safety specialist and have independent offices including staffs design the management system, safety problems that should be solved and decrease the number of accidents, and these officers have the responsibility that make a regular meeting for safety and organizing training program and providing the equipment's for all the workers due to the avoid occupational accident at work.

REFERENCES

Ali, S., Mohamed, T. H., & Tam, W. Y. V. National Culture and Safe Work Behaviors of Construction Workers in Pakistan. *Safety Science*, 47(1), 29-35. (2009).

Ashraf J., Construction Safety in Kingdom of Saudi Arabia, Eastern Mediterranean University, November, 54 – 57. (2013).

Basha, C. R. C. H. E., Hassan, O. J., & Hanafi, W. H. W. A. N. Perception of Building Construction Workers Towards Safety, Health and Environment. *Journal of Engineering Science and Technology*, *2*(3), 271-279. (2007).

Bernardini Ramazzini, *De Morbis Artificum Diatriba* (*Diseases of Workers*) (1682).

Chan, D. W., Chan, A. P., & Choi, T. N.. An Empirical Survey of the Benefits of Implementing Pay for Safety Scheme (PFSS) in the Hong Kong Construction Industry. *Journal of Safety Research*, 41(5), 433-443. (2010).

UCTEA (Union of Chambers of Turkish Engineers and Architects) , *Chamber Report MMO/590 ,* 15-50. Ankara, April (2012).

Ceylan H., ‘ Analysis of Occupational Accidents According to The Sectors in Turkey’, Gazi University Journal of Science, 25(4): 909-918 (2012) .

CSGB (Ministry of Labour and Social Security) ‘İs Sağlığı ve Guvenliğine İliskin Tehlike Sınıfları Tebliği’, *Official newspaper*, Number: 27320, (2009).

Deng, Z. M., C. M., Zeng, S. X., & .Identifying Elements of Poor Construction Safety Management in China. *Safety Science*, 42(7), 569-586. (2004).

Gurcanli, G. E., "Third party and child injuries at construction sites in Turkey" Safety Science 47 (2009) 364–373 Istanbul. (2008)

Güyagüler T., September, Occupational Health and Safety, Middle East Technical University, Lecture Book (2000).

Hassanein, A. A., & Hanna, R. S. Safety Performance in the Egyptian Construction industry. *Journal of Construction Engineering and Management*, 134(6), 451-455. (2008).

Heinrich HW, Peterson D & Roos N , Industrial Accident Prevention, 5th Edition, Mcgraw Hill, New York, (1980).

Haunert S., Occupational Health and Safety in Germany: A Risk – Based Approach?, 19-44 , August (2012).

Huang, X., & Hinze, J.. Owner‟s Role in Construction Safety. *Journal of Construction Engineering and Management*, *132*(2), 164-173. (2006).

ILO , Report on the Replies to the Questionnaire on the Updating of the "List of Occupational Diseases" Annexed to the List of Occupational Diseases Recommendation, (2005).

Lee, C. K. and Yusmin, J. Prioritization of Factors Influencing Safety Performance on Construction Sites: A Study Based on Grade Seven (G7) Main Contractors' Perspectives. In *2012 International Conference on Business, Management and Governance in Hong Kong (ICBMG2012)* (Vol. 57). (2012).

Skitmore M, R., Pong Cheng, K., & Ng, T. S. A Framework for Evaluating the Safety Performance of Construction Contractors. *Building and Environment*, 40(10), 1347-1355. (2005).

Niu S., Ergonomics and occupational safety and health: An ILO perspective, March (2010).

SGK (Social Security Institution), "2004 Statistical Yearbooks", *SGK Publish*, Ankara, (2007).

SGK (Social Security Institution), “2005 Statistical Yearbooks”, *SGK Publish*, Ankara, (2008).

SGK (Social Security Institution), “2006 Statistical Yearbooks”, *SGK Publish*, Ankara, (2009).

SGK (Social Security Institution), “2007 Statistical Yearbooks”, *SGK Publish*, Ankara, (2010).

SGK (Social Security Institution), “2008 Statistical Yearbooks”, *SGK Publish*, Ankara, (2011).

SGK (Social Security Institution), “2009 Statistical Yearbooks”, *SGK Publish*, Ankara, (2012).

SGK (Social Security Institution), “2010 Statistical Yearbooks”, *SGK Publish*, Ankara, (2013).

SGK (Social Security Institution), “2010 Statistical Yearbooks”, *SGK Publish*, Ankara, (2014).

APPENDIX

Safety Questionnaire

Name of the Company: _____

Annual Turnover of the Company (please select one):

- o Less than 100.000 TL
- o 100.000 – 500.000 TL
- o 500.000 – 5.000.000 TL
- o More than 5.000.000 TL

Number of Employees (please select one):

- o Less than 20 Person
- o 20-50 Person
- o 50-100 Person
- o More Than 100

Name of Employee: _____

Position in Company: _____

Work Experience (please select one):

- o Less than 5 years
- o Between 5 and 10 years
- o Between 10 and 20 years
- o More than 20 years

Question No	Questions		YES	NO
Q1	**Health And Safety Meetings**	Do you have regular meetings for safety?		
Q2		Can you tell your own ideas about safety in these meetings?		
Q3		Do you think frequency of these meetings is enough?		
Q4		Do you think health and safety meetings are effective?		
Q5	**Training Programs**	Have you been trained on how to use the personal protective equipment?		
Q6		Have you been trained on how to use the fire protection equipment?		
Q7		Does your company have training program for the new workers?		
Q8		Do you have regular training programs for safety?		
Q9		Have you been trained on how to use the emergency procedures?		
Q10	**Supervision on Workers**	Do you have first aiders near you?		
Q11		Do you wear the safety belts during work ?		
Q12		Do you wear the safety helmets during work?		
Q13		Do you use eye protection devices during work?		
Q14		Do you wear safety boots during the work?		
Q15	**Personal Attitudes and Habits of the Workers**	Have you ever witnessed any fatal accidents?		
Q16		Do you think your job is dangerous?		
Q17		Do you feel anxious to work in an unsafe environment?		
Q18		Can you obtain necessary safety equipment whenever you want?		
Q19		Do you think age of the workers has an effect on their safety during the work?		
Q20		Do you think age is an important parameter for long-working hours or overtime working?		
Q21		Do you have some kind of occupational disease?		
Q22		Did you read information about how to use equipment safely?		
Q23	**Administration of the Company**	Are there enough safety signs around the working area?		
Q24		Does your company keep records for accidents?		
Q25		Is this company pays enough attention to safety and health?		
Q26		Is there enough daily/weekly/monthly/annually controls on safety equipment?		