

**The Impact of an Occupational Health and Safety
Management System on Workers' Performance in the Abu
Dhabi Construction Industry**

تأثير تطبيق نظام السلامة والصحة المهنية على أداء العمال في قطاع البناء
والإنشاء في إمارة أبوظبي

by

AWATIF ALHOSANI

**A thesis submitted in fulfilment
of the requirements for the degree of
DOCTOR OF PHILOSOPHY IN PROJECT MANAGEMENT
at
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Abstract

Abu Dhabi Occupational Safety and Health Center (OSHAD) was established as a government center in Abu Dhabi in 2010. The objective of the Center is to manage and ensure the proper implementation of an integrated occupational health and safety management system in the Emirate.

Many researchers have highlighted the relationship between applying occupational health and safety management systems and the impact on workers' performance. However, there is limited research on the impact on workers' performance of the occupational health and safety management system that is implemented in Abu Dhabi. Hence, this study carries out an evaluation of the impact of OSHAD SF using several performance indicators: commitment, absenteeism, work alienation, and job performance.

This study has contributed to the literature in that it evaluating in depth the current OSH situation in construction companies. This evaluation will support the regulatory body by suggesting opportunities of enhancing in the regulations on implementation. This study also contributes to understanding the personal traits of workers' in construction companies in Abu Dhabi. If owners and supervisors of companies understand these traits, it will be easier for them to deal with workers' welfare and will enable companies to provide OSH training.

This study suggests that further research into safety risks in Abu Dhabi construction industry is required. Increasing the number of studies that investigate the activities in this important sector will provide a larger database and validate further the findings of this study.

ملخص

تأسس مركز أبوظبي للسلامة والصحة المهنية كجهة حكومية في إمارة أبوظبي في العام 2010 بهدف إدارة وضمان تنفيذ نظام الصحة والسلامة المهنية في الامارة.

وقد أبرز العديد من الباحثين العلاقة بين تطبيق أنظمة إدارة الصحة والسلامة المهنية وتأثير ذلك على أداء العمال. ومع ذلك، هناك بحوث ودراسات محدودة حول تأثير نظام إدارة الصحة والسلامة المهنية على أداء العمال والذي يتم تطبيقه في أبوظبي. حيث أجرت هذه الدراسة تقييماً لأثر تطبيق النظام على عدة مؤشرات أداء متضمنة: الالتزام، والتغيب، والاعتراب عن العمل، وتأثير ذلك على الأداء الوظيفي بصورة عامة.

قد ساهمت هذه الدراسة بتطوير البحث والدارسات من حيث أنها تقيّم بعُمق الوضع الحالي للسلامة والصحة المهنية في شركات البناء. وسيدعم هذا التقييم الجهة التنظيمية باقتراح فرص تعزيز اللوائح المتعلقة بالتنفيذ. كما تساهم هذه الدراسة في فهم السمات الشخصية للعمال في شركات البناء في أبوظبي. وإذا فهم أصحاب الشركات والمشرفون على هذه السمات، فسيكون من الأسهل عليهم التعامل مع رفاهية العمال، كما سيتمكن الشركات من توفير التدريب اللازم في مجال الصحة والسلامة المهنية.

تشير هذه الدراسة إلى ضرورة إجراء المزيد من البحوث حول مخاطر السلامة في صناعة البناء في أبوظبي. ومن شأن زيادة عدد الدراسات التي تبحث في الأنشطة في هذا القطاع الهام أن توفر قاعدة بيانات أكبر وتثبت من صحة نتائج هذه الدراسة.

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Abbreviations

CoP	Code of Practice
EC	Executive Council, Abu Dhabi
ILO	International Labour Organization
OSHAD	Occupational Health and Safety Center, Abu Dhabi
OSHAD SF	Occupational Health and Safety Standard Framework. This is the name of the OSH management system implemented in the Emirate of Abu Dhabi

CHAPTER ONE: GENERAL INTRODUCTION AND THE BACKGROUND OF THE RESEARCH

Introduction

This chapter covers the research problem, and research significance. At the same time, it highlights the research main components, namely, aims, objectives and questions.

The chapter also presents the research hypothesis. It outlines the scope and methodology of the thesis. Finally, it outlines the thesis chapters in turn and gives a brief note about their contents.

Background to the research problem

Construction sector

The construction industry is one of the important industries, employing around 180 million people all over the world (Fung, 2010). Directly or indirectly, the modern economy is based on the development of the construction industry. It is the key driver and partner of economic growth in any country, for it provides the infrastructure that has a vital role in development.

Despite its recognition as foremost in the world economy, the construction sector is considered a risky sector. Hinze (2005) argued that the mining industry is the only industry which has a worse accident record than the construction sector.

Although construction sector has experienced a number of improvements to ensure the safety of its operations, it is still a highly risky occupation where accidents are considered high compared to other world industries. These accidents result in productivity loss, the permanent disability of employees and absenteeism. The ILO has reported that the construction industry has a disproportionately high rate of recorded accidents (ILO, 2019), (Shafique & Rafiq, 2019).

Causes of accidents in the construction sector

The most popular of the many models that conceptualize accidents, are the Heirnich pyramid model, and James Reason's Swiss Cheese model (Hosseinian & Torghabeh, 2012).

In his 1931 book "Industrial Accident Prevention, A Scientific Approach", Heinrich put forward a concept that became known as Heinrich's Law: in a work-place, for every accident that causes a major injury, there are 29 accidents that cause minor injuries and 300 accidents that cause no injuries (Heinrich, 1931). This is shown in Figure 1.1.

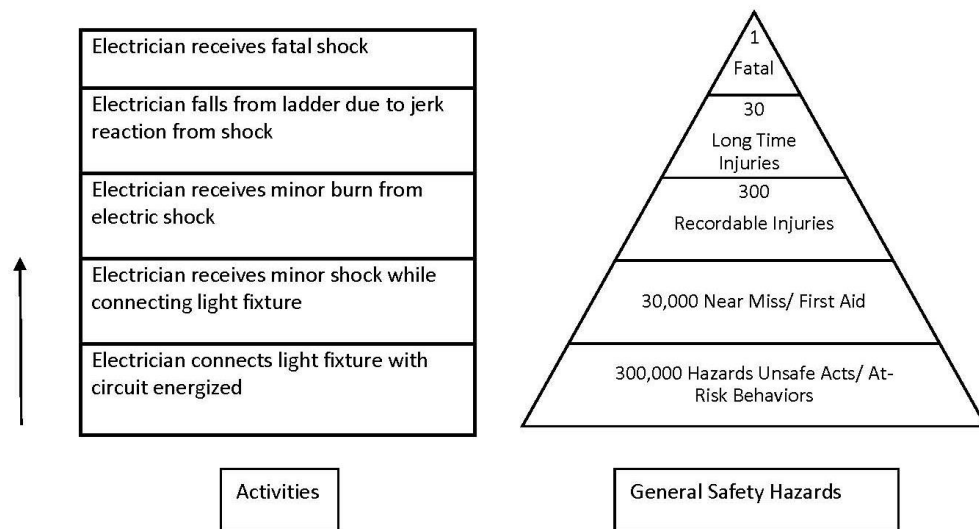


Figure 1-1: An illustration of Heinrich's theory- the safety pyramid

The second model is the 'Reason model' which presents the causes of accidents and links human defense systems to a series of slices of randomly-holed Swiss cheese arranged vertically and parallel to each other with gaps between each slice. It shows that most accidents can be traced to one or more of the four levels of failure: organizational influences, unsafe supervision, preconditions of unsafe acts, and unsafe acts.

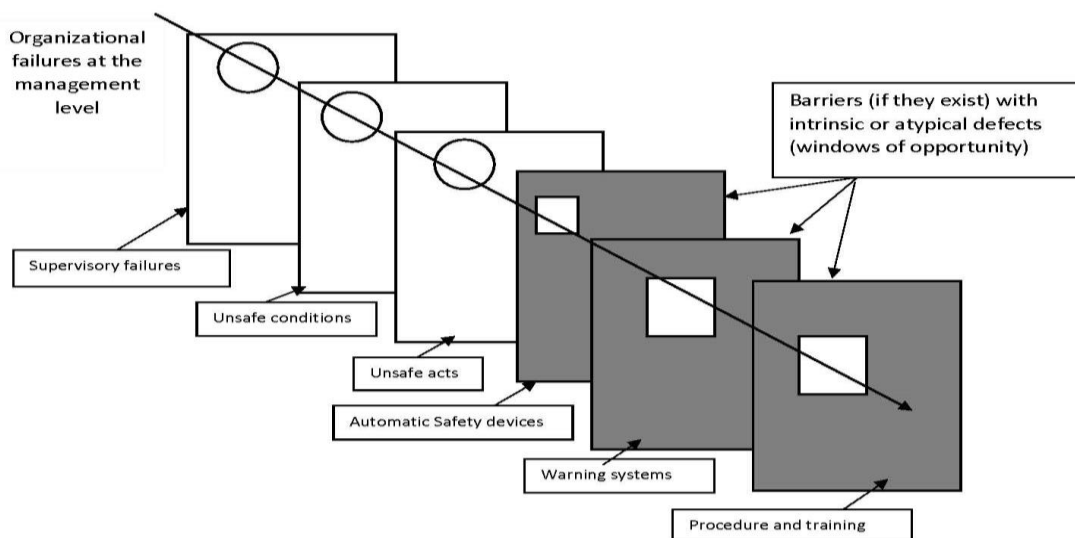


Figure 1-2: Swiss Cheese Accident Causation Model (James Reason, 1970-77)

The above model shows that an organization's defenses against failure are modelled as a series of barriers, represented as added slices of the cheese. (The holes present the individual weaknesses

in the organizational system.) The system may fail as whole if the holes in all of the slices are momentarily aligned and if hazard passes through all holes this will lead to an accident (Hosseinian & Torghabeh, 2012).

A study was conducted by the National Safety Council and Du Pont Company in 1998 to observe reasons for accidents (see Table 1.1).

Causes	National Safety Council (%)	Du Pont Company (%)
Unsafe conditions	10	4
Unsafe behaviours	88	96
Unknown causes	2	

Table 0-1: Root causes of industrial accidents

Source: Human Performance Technologies, 1998

It shows that human behaviour is responsible for 88% of industrial accidents while only 10% can be attributed to unsafe working conditions. This implies that ignoring human behaviours in any safety initiative may cause its failure. The human dimension is an essential factor in any initiative that aims to build a culture of safety in an organization.

Results of accidents in the construction sector

Most of the deaths in the construction industry result from falls from a height, motor accidents, (being struck by a vehicle), etc. (Rajaprasad, Rao, & Chalapathi, 2013). Other health related issues in the construction industry that occur on-site are injuries from construction tools and injuries due to lifting objects, slipping or falling, exposure to harmful objects, etc. (Rajaprasad, Rao, & Chalapathi, 2013). A number of reasons may be blamed for such incidents, such as the risky nature of construction, poor health facilities, a complicated contracting and subcontracting system, a poor safety management system, and others. The production process in the construction industry is very distinctive and difficult compared to other industries. Construction sites are mostly small and have insufficient storage space for secondary works and this forces workers' to work in confined spaces. This increases the risk of accidents when too many workers' have to share the same space. To make matters worse, construction operations include diverse activities which may require the presence of many subcontractors on site. This increase raises the probability of accidents even higher (Teo, Ling, & Chong, 2005).

Statistics have shown that fatalities, incidents and accidents everywhere continue to occur on construction sites. Despite the safety systems and regulations implemented on the ground, the

operations of the construction industry are unsafe due to its special working conditions, which may vary from day to day. These hard conditions pose challenges to the industry and its workforce (Hinze, 2005).

The health and safety statistics for the construction sector in Great Britain in 2017 reveal that 80,000 workers' were suffering from work-related ill health each year. In 2016/2017 the total number of fatal injuries was 30, with 64,000 non-fatal injuries to workers' per year. The percentage of work-related ill health by type of illness was 65% musculoskeletal disorders, 20% other illnesses, and 15% stress, depression, or anxiety. The major reason behind the fatal injuries was falls from a height (49%); next, being trapped by something collapsing/overturning (10%) and being struck by a moving vehicle (10%). The main kinds of accident causing non-fatal injuries to employees were slips, trips or falls on the same level, being injured while handling, lifting or carrying something, falling from a height, and being struck by a moving object, including flying/falling objects, (HSE, Health and Safety Executive , 2017).

As shown above, the HSE has indicated that fatalities, injuries, incidents and accidents take place in construction in the UK and the same can be said of construction sites all over the world. In order to address this problem, risk management and risk awareness are considered crucial for reducing the rate of accidents and health problems in this sector (Smith, Merna, & Jobling, 2014). OSHAD has focused over the last few years on training employees in all sectors in the Emirate of Abu Dhabi in the regulatory system requirements and CoPs. This study will examine the level of knowledge of workers' in the construction industry about the requirements of three of the main CoPs (First Aid, PPE, and Safety in the Heat).

Research objectives

The aim of the research is, then, to evaluate the impact of applying OSHAD SF on the performance of workers' in the construction sector in Abu Dhabi.

To achieve the aims of the research, the following objectives were pursued:

- **Objective 1:** Investigate the current status of the occupational health and safety management system (OSHAD SF) in the construction industry in Abu Dhabi.
- **Objective 2:** Examine the level of workers' understanding of OSHAD guidelines and framework in the construction companies in Abu Dhabi

- **Objective 3:** Investigate the effect of OSHAD SF on workers' performance in the construction sector
- **Objective 4:** Find the relationship between the personal traits of workers' in the construction sector in Abu Dhabi, organizational commitment, and job performance.

All of these points are looked at in detail in the proposed study so as to form a conclusion regarding the benefits of working under OSHAD SF for all construction companies.

Research Significance and knowledge contribution

In recent years, many studies have demanded research in the field of occupational health. These demands have forced us to redefine and change the policies and priorities involved in this area, and recognize the need to establish priorities that would enable us to respond better to the increasing number of requirements made by occupational health and safety (Iavicoli, Rondinone, Marinaccio, & Fingerhut, 2006). This study conducted a comparative analysis of the main projects to identify OSH priorities and measures reported in the literature. The agenda identifies 21 research priorities. Globally, the main research priority areas identified in the studies analyzed shows that we should focus on technical guidance in occupational health, intensive partnerships in Africa, child labour and adolescent workers' (Iavicoli, Rondinone, Marinaccio, & Fingerhut, 2006) and on the elimination of silicosis, the health care workers', health promotion activity, mental health and stress at work, the promotion of OSH in small enterprises and in the informal sector, the prevention of musculoskeletal disorders, preventive technology, the training of occupational health and safety personnel, internet resources and networks, national and local profiles and indicators, cost-effectiveness and interventions, and the global burden of disease.

The above list indicates that there is a need to focus on many areas including technical guidance, and the training of OSH personnel, both of which are covered in this study.

Many studies have been conducted on occupational health and safety and the relationship of occupational health with safety management and performance. However, few researchers have considered the impact of implementing an occupational health and management system on workers' performance in the construction sector in Abu Dhabi. This project provided a valuable opportunity to advance our knowledge about the impact of management systems on the employees in Abu Dhabi.

To this end, this study evaluated the impact of an occupational health and safety management system according to several performance indicators, i.e. commitment, absenteeism, work alienation, and job performance.

The findings should make a significant advance of our knowledge on three levels;

Operational level:

- This study provides an opportunity for the entity charged with implementing OSH management system in the Emirate of Abu Dhabi to better understand the impact of managing health and safety in the work-place. The system is very important because it protects employees; besides, healthy and happy employees also increase productivity
- It showcases a better model for describing the relationship between the OSH management system and performance of workers in the selected sector through the government support for the integration of external environmental factors.

Strategic level:

- This study has vital business implications in the form of best practices for improving performance in Abu Dhabi. The government may use the findings from this study to create or modify the policies and regulations that should enhance international competitiveness.

Academic level:

- This study develops a comprehensive linkage model that examines all the variables to conceptualize a robust model to assess the influence of OSHAD on the performance of construction works.
- This study uses a combination of personal traits and organizational commitment to explain the influence of the OSH management system. In this sense, it has extended the OSH literature, confirmed some of the existing findings and highlighted new relationships between the model variables
- Most previous studies have examined workers' performance in terms of organizational commitment, personal traits and OHS in turn. Thus, the use of personal traits and organizational commitment as independent variables in this study provides a significant contribution to the HS literature

- This study is one of the few to be located in Abu Dhabi. It is the first to evaluate the impact on performance of implementing an occupational health system.
- The study uses new conceptual frameworks/concepts and hypotheses

Research questions

The following questions were developed in relation to the study objective which was to investigate the impact of Implementing OSHAD SF on workers' performance in the construction industry in Abu Dhabi. To answer this question, the following questions had to be addressed:

- What is the construction companies' level of understanding of the guidelines and framework of OSHAD SF in Abu Dhabi?
- What is OSHAD SF and how does it work to safeguard workers from risky situations and protect the safety and health of the workers in the construction industry?
- Does the implementation of OSHAD SF by the construction companies in Abu Dhabi have an impact on the workers' performance in this field?
- Do specific personal traits affect workers' performance and encourage them to adopt and follow the requirements of OSHAD SF?

Research Hypothesis and Sub-Hypotheses

The main hypothesis of the research is that OSHAD SF has an impact on workers' performance. The dependent variable is performance and the independent variable is OSHAD SF.

To achieve the research objective, the following sub-hypotheses were developed before the fieldwork began:

- I. Hypothesis 1: There is an association between OSHAD SF and affective commitment.
 - a. Dependent variable: affective commitment
 - b. Independent variable: OSHAD SF
 - c. Group: the construction sector in Abu Dhabi

Sub-hypotheses:

H1.A: There is an association between OSHAD SF (personal protective equipment (PPE)) and affective commitment.

H1.B: There is an association between OSHAD SF (first aid) and affective commitment.

H1.C: There is an association between OSHAD SF (safety in the heat) and affective commitment.

II. Hypothesis 2: There is an association between OSHAD SF and absenteeism.

- a. Dependent variable: absenteeism
- b. Independent variable: OSHAD SF
- c. Group: the construction sector in Abu Dhabi

Sub-hypotheses:

H2.A: There is an association between OSHAD SF (personal protective equipment (PPE)) and absenteeism.

H2.B: 'There is an association between OSHAD SF (first aid) and absenteeism.

H2.C: 'There is an association between OSHAD SF (Safety in the Heat) and absenteeism.

III. Hypothesis 3: 'There is an association between OSHAD SF and work alienation.

- a. Dependent variable: work alienation
- b. Independent variable: OSHAD SF
- c. Group: the construction sector in Abu Dhabi

Sub-hypotheses:

H3.A: There is an association between OSHAD SF (personal protective equipment (PPE)) and work alienation.

H3.B: 'There is an association between OSHAD SF (first aid) and work alienation.

H3.C: 'There is an association between OSHAD SF (safety in the heat) and work alienation.

IV. Hypothesis 4: There is an association between OSHAD SF and job performance.

- a. Dependent variable: job performance
- b. Independent variable: OSHAD SF
- c. Group: the construction sector in Abu Dhabi

Sub-hypotheses:

H4.A: There is an association between OSHAD SF (personal protective equipment (PPE)) and job performance.

H4.B: ‘There is an association between OSHAD SF (first aid) and job performance.

H4.C: ‘There is an association between OSHAD SF (safety in the heat) and job performance.

The table below summarizes the above associations between the hypotheses and sub-hypotheses

Table 1-0-2: Association between hypotheses and sub-hypotheses

No	Dependent variable	Independent variable	Group	Sub- hypothesis 1	Sub- hypothesis 2	Sub- hypothesis 3
Hypothesis 1	affective commitment	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment (PPE) & affective commitment	first aid & affective commitment	Safety in the heat & affective commitment
Hypothesis 2	absenteeism	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment (PPE) & absenteeism	first aid & absenteeism	Safety in the heat & absenteeism
Hypothesis 3	Work alienation	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment (PPE) & Work alienation	first aid & Work alienation	Safety in the heat & Work alienation
Hypothesis 4	job performance	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment (PPE) & job performance	first aid & job performance	Safety in the heat & job performance

The following are some of the research questions which are answered in this study:

1. What are the risks faced by workers in the construction industry in Abu Dhabi?
2. What is the level of commitment to the OSHAD SF guidelines and framework among construction companies in Abu Dhabi, and how far is it successful in protecting the workers and ensuring their safety?
3. What is OSHAD SF and how does it work to protect the workers from risky situations and to ensure the safety and health of the workers in the construction industry?

4. Does the implementation of OSHAD SF by the construction companies in Abu Dhabi have any impact on the workers' performance in this field?

Thesis Outline

This study was undertaken to propose some important and significant steps for the benefit of workers in the construction industry in Abu Dhabi by investigating the impact on construction workers' performance of implementing occupational health and safety management systems in Abu Dhabi.

The figure below illustrates the research outline, displaying each chapter in order and in relation to the other chapters.

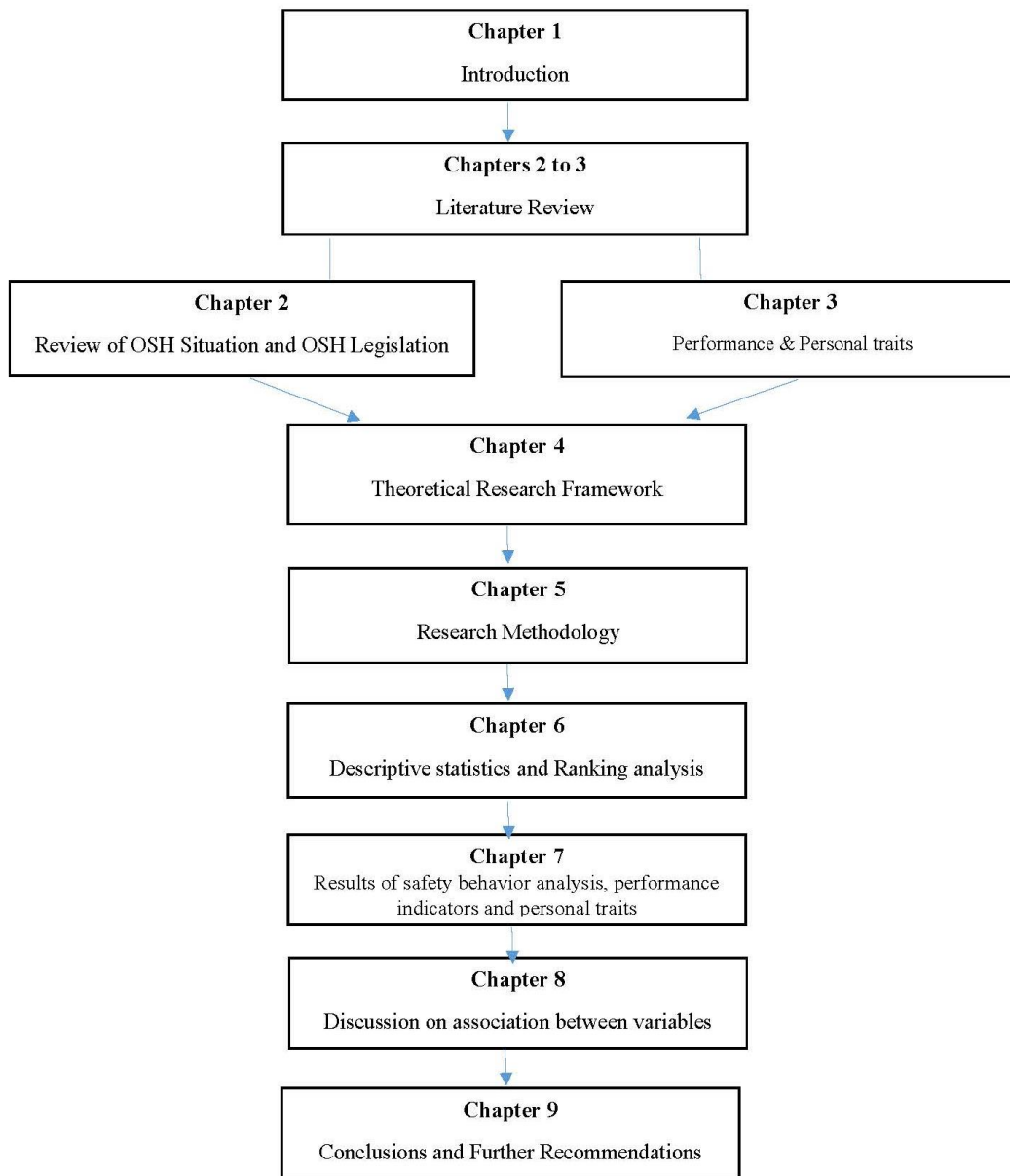


Figure 1-3: Research Outline

Chapter One: This summarizes the research problem, rationale and significance, research objectives and aims, research questions and hypotheses, research methodology and thesis outline.

Chapter Two: Extensive literature review of the OSH situation and OSH legislation. The first section of the chapter presents the occupational health and safety situation worldwide, in the UAE and in Abu Dhabi. The second section covers the legislation worldwide and specifically in Abu Dhabi.

Chapter Three: This chapter focuses on performance. Two main concepts are covered: performance appraisals and performance management. It covers the theory behind these. It also highlights the factors affecting performance. Some of the main KPIs are covered, namely, affective commitment, absenteeism, work alienation and job performance. Finally, in this chapter, personal traits are covered, with a focus on one of the main personal traits theories, that of the Big Five personality traits.

Chapter Four: This contains suggestions for investigating conceptual and theoretical frameworks and for hypotheses.

Chapter Five: This contains comparisons between research philosophies, paradigms and approaches. It goes on to justify the research philosophy, research approach, research methods and methods of data analysis that were adopted.

Chapter Six: This chapter presents the collected data and statistics, followed by the results of the research questionnaire, and those for the reliability tests for both dependent and independent variables.

Chapter Seven: This chapter discusses the assumptions and results of the correlation tests. It then outlines the results of the key analysis conducted in the study in order to test the developed hypotheses and the research framework of the study which is linked to the workers' performance and their personal traits. In order to perform the analysis, several statistical tests were performed namely, correlation analysis, regression analysis, structural modeling using AMOS. The findings of these tests are shown in graphic form.

Chapter Eight: This chapter is set on the foundation laid in Chapter Seven, which exhibited the results in order of hypothesis and carried out the statistical analysis. For its part, Chapter Eight discusses in detail the results of each hypothesis in light of the research aim, research subject and the review of the key studies in Chapters Two and Three. The discussion in Chapter Eight details the association of OSHAD SF with affective commitment, absenteeism, work alienation and job satisfaction, together with the association of workers' personality traits and job performance.

Chapter Nine: Chapter Eight discussed and summarized the major findings of the research. This chapter briefly presents the conclusions drawn and outlines the researcher's view of the strengths and weaknesses of the research approach. The chapter includes also a statement of the contribution of knowledge made by the thesis and future research recommendations.

Summary

Studies have shown that there is a close relationship between performance, occupational health and safety, and occupational health and safety management systems, as many studies have sought to show. However, few have written on the impact of implementing occupational health and management system on workers' performance in the construction sector in Abu Dhabi. This study offers a good chance to learn more about the impact of implementing management systems in the employees in the Emirate of Abu Dhabi.

CHAPTER TWO: REVIEW OF OSH AND OSH LEGISLATION

Introduction

According to the research study conducted by the Tampere University of Technology in 2014, work-related ailments and annual rates of occupational accidents have become a reason for the deaths of more than 2.3 million persons. In the study, the data were collected from the recent statistics of the whole world to do with occupational health and safety. For this purpose, the global report of the International Labour Organization (ILO 2010) provided estimates for the World Congress. The report mentioned that in 2010 the projected world figure for work-related diseases was 1.9 million, including 6,300 persons who would die because of work-related diseases. The number of occupational accidents was 352,766, of which 6,300 were fatal. The causes of work-related mortality include malevolent neoplasms [29%], circulatory diseases [35%], violence and accidents [15%], respiratory diseases [7%] and communicable diseases [10%]. The other causes of workers' deaths were genitourinary diseases [1%], digestive diseases [1%], and neuropsychiatric conditions [2%] (Nenonen & Saarela, 2010).

From the reflection of this report, it is very clear that work has high levels of risk connected with it, which can influence both workers and employers in a company. Furthermore, studies have demonstrated that better occupational safety and health [OSH] practices and policies result in better business for companies. The studies discussed below reveal the importance and benefits of OSH in the organization. These studies range from general to specific, which means that the discussion moves from the OSH situation around the world to the OSH situation in the construction industry of Abu Dhabi, covering the OSH situation in the Arab countries and the UAE and the general OSH situation in Abu Dhabi.

The OSH Situation Worldwide

Almost 45% of world's workers are classified as members of a global workforce. In addition, 58% of the population over 10 years old belong to the same category. The world's economy and sustainability depends directly on their work and their working capacity (WHO, 1995). The WHO report stated that the major part of the global population works in various industries. The workforce is very important for the development and sustainability of the whole world because all the organizations in the public and private sectors depend upon the labour force.

Consequently, this portion of the world's population needs special attention from governmental and private organizations. As the report indicates, 58% of the population is subject every day to a great number of occupational accidents or occupational diseases that vary according to the nature of the work. This leaves the workers feeling unsafe. The WHO in its report of 1995 also deplored that workers all over the world have no security in their work. Manufacturing and production industries, such as textiles, construction, oil and gas, etc. do not provide workers with occupational health and safety, although they are dangerous to work in. They need what employers deem too much in the way of security measures. According to the WHO report, workers everywhere are not safe and the occupational safety and health of workers is at severe risk.

Companies are required to adopt the rules and regulations of the ILO in order to ensure the occupational safety and health of the workers in every industry, but this can also improve the performance of companies and employees. The ILO continues to examine the working conditions of organizations around the world and publishes various reports, one of which, published in 2005, compares occupational accidents data from the WHO with the 1998 data available at the time. The study covers the progress of estimated and reported fatal and non-fatal accidents, 1998-2001 in eight different regions, namely,

- EME (countries with Established Market Economies) ,
- FSE (Former Socialist Economies including Kazakhstan and Russia),
- (IND (India),
- CHN (China),
- OIA (Asia and Islands including Korea, Malaysia, and Thailand),
- SSA (Sub-Saharan African countries including Zimbabwe, Ethiopia and Togo),
- LAC (Latin-American countries including Argentina, Brazil, El Salvador, Nicaragua, and Panama),
- MEC (the Middle Eastern Crescent including Turkey, Egypt, Morocco, and Tunisia).

In EMS, the fatal accidents reported to ILO numbered 14,314 in 2001 and 14,608 in 1998 overall. In FSE, it was 7,853 in 2001 and 8,665 in 1998. In India, the fatal accidents reported numbered 222 in 2001 and 211 in 1998. The fatal accidents reported in China totaled 12,736 in 2001 and 17,804 in 1998. The fatal accidents reported in OAI totaled 3,051 in 2001 and 5,631 in 1998. In

SSA, they amounted to 145 in 2001 compared to 1,675 in 1998. In LAC the fatal accidents reported numbered 2,009 in 2001 and 6,998 in 1998. Finally, the fatal accidents in MEC were reported to the ILO as 1,416 in 2001 and 1,876 in 1998 (Takala, 2002). Clearly, fatal accidents from 1998 to 2001 in all the above regions were very numerous. The figures listed above are troubling enough to be a wake-up call to the governments of these regions. But in addition, the figures from China suggest that the country was becoming somewhat more safety-conscious because the fatal accidents decreased considerably between 1998 and 2001. However, compared with the data from, China's figures look huge. Therefore, like other countries, China is required to improve its occupational and safety health practices. Meanwhile, the published statistics show that the highest number of fatal accidents occurred in EME and the lowest in SSA. In addition, the statistics present a decreased number of fatal accidents from 1998 to 2001 in six regions and an increase in two regions only (EME and India). The most dramatic decrease in fatal accident reports to the ILO (153%) comes from SSA (from 1,675 fatal accidents to 145 only).

The advanced technology in the construction industry gives a conflicting impression. On one side, the construction industry has grown due to improved methods of construction, but on the other side this has resulted in inadequate health and safety conditions for the workers. The use of heavy machines and working on higher blocks of flats and other buildings without the support of health and safety instruments, garments and equipment have put the workers into disastrous situations (Farooqui & Rafeeqi, 2008). One study shows that many of the employees in the construction industry experience fitness issues and have minor or major injuries caused on construction sites (Smith, Huang, Ho., & Chen, 2006). Another study by Nawaz and his colleagues concluded that from 1989 to 1991 about 255 employees in Australia were severely injured in the construction industry. This big number demonstrates the lack of occupational safety and health management measures in this context. Further, the authors in their statistical analysis showed that the death rate in places of construction was 10.45 per 100,000 employees (Nawaz, Ishaq, & Ikram, 2013). Similarly, the study of Gürcanli and Müngen (2013) shows that in China around 3000 workers die in the construction industry because of accidents at work. These figures from two countries show that too little attention to safety is paid there by employers in the construction companies. Hence, the employers do not provide a health-friendly and accident-free working environment (Gürcanli & Müngen, 2013).

The later literature is full of the factors that cause accidents on construction sites. Many authors have tried to bring out valid reasons for the accidents to employees on construction sites. A study conducted in 2002 demonstrates that the key reasons behind the construction workers' accidents are the ineffective enforcement of safety rules, unavailability of safety instruments, unavailability of proper training, lack of health-friendly methods, hazardous nature of construction sites and infrequent use of safety instruments. Moreover, irresponsible attitudes to the adherence to safety and sudden deviations from mutually confirmed behaviour between employees and employers are also part of the reasons behind construction workers' accidents (O'Toole, 2002). However, another study argues that one highly pertinent reason such accidents is the unsafe behaviour on the part of employers (Sawacha, Naoum, & Fong, 1999). Meanwhile, other causes such as being caught in machinery and falls from machines or buildings, or electrocution and building manuals account for deaths on construction sites (Nawaz, Ishaq, & Ikram, 2013). In addition, Huang and Hinze (2006) studied the main types of injury in construction workers. For this purpose, the authors interviewed around 136,000 injured construction employees. The monetary impact of injuries was examined by counting the injured employees and the costs connected with the injury. The writers concluded that more than the half the accidents related to lacerations and most of the scars remained in the lumbar spinal region, the eyes and upper extremities (Huang & Hinze, 2006).

In contrast, Hassanein and Hanna (2008) surveyed the Egyptian construction industry and concluded that the construction workers there failed to adopt effective security measures or observed them inefficiently. Incidentally, the cost of insurance against accidents was the same, regardless of the security measures adopted by the contractors (Hassanein & Hanna, 2008). Further, Smulders showed that the most frequent cause of injuries and fatalities in the construction industry is the collapse of employees from a high position (Smulders, 2006). Elsler et al. (2010) similarly maintain that the main reasons for construction incidents are working on scaffolding or platforms without sentinel-rails, on broken roofs and on flimsy ladders, which are not securely held up, are unsafe and stick. Tripping and slipping are also frequent examples of construction disaster (Elsler, et al., 2010). According to the above discussion, then, the salient element or the reason for the dangerous nature of construction work is the lack of safety measures, which itself is the cause of injuries and fatalities.

OSH Situation in the UAE

A study by Daud & Rabaayah (2015) regarding occupational safety and health in the UAE demonstrated that the labour department of the Abu Dhabi government is pressurizing employers in the designing, manufacturing and production industries to create easier working conditions. Moreover, the government has asked companies to develop a worker friendly environment in work-places. This article discusses the steps taken by the government to resolve occupational safety and health issues in certain industries of the state, but says that the government has not taken any steps to create worker-friendly conditions in its construction industry. The government's current stance towards occupational safety and health shows that employers have ignored it, since many of them have been reported, according to the government data. Most of the cases come from the construction industry and the main complaint is the improper use of safety equipment. The workers were not even given training in securing themselves while working in a dangerous position in the construction (Daud & Rabaayah, 2015).

Other research indicates that the UAE also finds it hard to provide occupational safety and health protection to its workers. A large proportion of them come from various countries to the UAE because of its rapid development. The country is going through an economic boom because of its ample resources and their investment in projects by many domestic and foreign companies. Many such projects are proceeding in the UAE, in which the workers are working but without any health or occupational security. The data regarding the transportation industry shows that drivers face repeated injuries to their hands because of continuous driving on longer routes. In the same way, the production companies also pay no attention to developing employee-friendly working conditions. The companies do not obey the laws of their government on occupational safety and health protection at work. The workers risk accidents in the operation of heavy machinery in the factories (Sonmez & Apostolopoulos, 2011) .

In factories there are no medical facilities for treating the victims of accidents on the spot. Because of the shortage of emergency centres, accidents to workers are converted into fatalities. Further, there is also insufficient enquiry into the reasons for injuries at work leading to deaths (Al-Kaabi & Hadipriono, 2003). The companies tend to be concerned only to get the work done by the workers, regardless of their health and security. This study also maintained that companies in the UAE lack the mechanisms for managing security management. Thus these mechanisms do not

work properly, due to which the employees who come from different countries are even more vulnerable to injuries at work. Hence, on the basis of this study it can be said that workers are denied security in their occupational practices, which become unhealthy and even injurious. Although the workers are the backbone of their company and contribute much to attaining the goals of their employers in the UAE, they are not valued.

Jannadi & Almishari (2003) used the risk assessment model in order to identify the risks associated with work in the construction industry of the UAE. For this purpose, they visited various sites where construction work was in progress. The risk assessment model showed that the degree of risk is very high in the construction sector of the UAE. The workers face many challenges to their health in their occupational concerns and have no security at work. The nature of the work is very difficult; the employees are required to climb to the tops of buildings and to run heavy machines and loaders. Any mishap in the movement of these machines can create much injuries. The model demonstrated that the condition of workers in the construction industry of the UAE is growing worse and needs strong legislation. Although the government has passed various acts, such as a labor law and others to create better work-place conditions, the companies are not taking these acts on board. Moreover, the workers are at risk of being killed or injured at any time and at greater risk of getting no medication in case of emergency. In the construction people fall from a height or are struck by materials and machines that surround them. This study also claims that the workers who come from abroad have no occupational or health security (Jannadi & Almishari, 2003).

OSH Risks in Abu Dhabi

With the vision of the UAE's leaders to diversify its sources of income beyond the oil industry, many fast-paced construction sites were set up. The rapid development of projects required the education, health and labor ministries to train sufficient numbers of industrial hygienists and safety inspectors to protect workers' health and safety, and led to the employment of large numbers of expatriates (Barss, Addley, Grivna, Stanculescu, & Abu-Zidan, 2009). Further, occupational injury seems to be one of the biggest risks in all the industries of the Emirate. Since the leaders of the Emirates emphasize the development of the oil and gas industry in the region many plants, buildings and sites are constructed which offer jobs to people from various countries. The expatriates in the country also face problems of occupational injury. The oil and gas industry requires employees to deal with many dangerous elements in the working day, such as the

chemicals used and processed in the factories. In response to this issue the leaders of the UAE have instructed the education, health and labour departments to develop procedures of work that are worker-friendly. All the departments are required to discuss the problems and come up with better solutions for the occupational and health safety of the employees.

Having accurate occupational health and safety data is seen as the basis for preventing risk. It is essential to know the extent of occupational accidents and work-related diseases, what they involve, how they occur, and where. In addition, data are important tools for decision-making in Abu Dhabi, as everywhere. The first occupational health and safety survey in Abu Dhabi was part of an environmental survey held in 2012 by the Statistics Center, Abu Dhabi (SCAD) and issued in 2014 (SCAD, 2014). This survey covers such areas as occupational safety and health statistics, the quantities of water used, the amount of energy consumed, as well as statistics on waste management for each economic activity included in the survey. The occupation health and safety survey covers the five main sectors of industry, construction (construction and building), transport, trade and services.

The number of annual working hours for industry in 2012, arranged by activity, was about 1.4 billion. For the construction sector it was 1.3 billion working hours. The working hours for transport totaled 56 million, 9 million for trade sector and almost 6 million for services. From the data, it is clear that the working hours of transportation were very high, suggesting that most of the labour in the UAE is employed in transportation, a particularly dangerous area because of it offers more chances of accidents. In 2012, the total number of deaths was 165. Of these, the construction sector constituted the largest percentage (47%), the industry sector 40%, the transport sector 8%, the trade sector 3%, and services 2%. In 2012, the rate of fatal incidents was 6.4 in transport, 4.7 in the construction sector, 3.4 in industry, 0.4 in trade, and 0.3 in services. The FAR rate is calculated by dividing the number of injuries that led to workers' deaths by a hundred million working hours. The injuries in the transportation sector are so high because employers and the public are less committed to implementing its safety measures.

The SCAD occupational health and safety survey also covers the time lost owing to injuries. In 2012, the time lost to injuries reached 75,000 hours, and include time lost to the total of fatal injuries, injuries causing total or partial disability, and the loss of working days to occupational injuries. The percentage by sector of time lost to injuries was 28% for transport and a rate of 36.2

of time lost (LTIR) per million working hours, 27% for services and 12.6 LTIR, 25% for industry and 12.6 LTIR, 13% for the construction sector and 7.9 LTIR, and finally 7% for transport and 36.2 LTIR.

The survey also shows the reportable dangerous occurrences which fall within and outside the scope of the work environment and may cause injuries or fatalities. In 2012, the total cases of reportable dangerous occurrences reached 196,000 with the highest percentage (37%) occurring in the industry sector followed by the construction sector (18%). The highest rate of reportable dangerous occurrences was in the transport sector with 86.5 per million working hours.

Finally, the survey presents the percentage of injuries requiring first aid, which shows the minor injuries that befall at the work site and are treated by first aid workers. Out of 65,8000 thousand cases in all sectors, the highest percentage occurs in the construction sector (33%). However, the number of cases that required professional medical or physical treatment was 57,000, most falling within the trade sector (26%), followed by the industry sector (24%). Hence, it can be said that the construction industry is only less likely to face injuries than the transportation industry. Both industries demand the government's special attention to reduce the number of injuries to workers which turn into fatalities. The workers in the construction industry of the UAE are not safe; their practices are harmful because they do very heavy work that can endanger their own bodies. Moreover, they are required to operate very heavy machines and lift them to great heights without the support of the necessary tools and equipment. The construction industry of the country is very careless and gives the workers no training in protecting themselves and others on construction sites.

OSH Risks in the Construction Sector in Abu Dhabi

There are very severe occupational risks in the construction industry. Examples of these severe risks entail scaffolding and ladders, working at height by employing gangways, excavating land by the use of explosives and earth moving machines, and the lifting of heavy materials by means of cranes and hoists. The construction industry is classified as much riskier than others due to a higher figure for injuries than is shown by other industries in Abu Dhabi, (Lopez-Valcarzel, 2001). In their research, Huang and Hinze (2006) analyzed the figures for accidents triggered by employees on construction sites and found various precursors of accidents. These authors inferred that most of the accidents had happened below a height of around 9.156 ft. (Huang & Hinze, 2006). Moreover, they found that these accidents were related to the companies that wanted for

commercial reasons to reduce the costs of implementing new construction plans. This means that the commercial construction companies focus on keeping costs low and do not care about protecting workers. Hence, they do not provide safety gear and equipment and recruit workers at the minimum wage.

Security, health, and safety are relevant to the construction industry, not least that of Abu Dhabi . Even though its construction industry is one of the world's developing industries, it is considered to be highly unsafe when it comes to occupational accidents (Huang & Hinze, 2006). It is evident that the construction industry in Abu Dhabi is very dangerous for its workers. The construction industry of Abu Dhabi is wide in scope but entails too many activities that are risky. Much evidence is found of this: for example, Shibani et al. (2013) mention that the construction industry in Abu Dhabi differs from all other industries because construction sites are changing, which is the greatest encouragement to cooperate in solving safety and health problems. A big proportion of construction projects in the state of Abu Dhabi relies on the cooperation of several firms and this makes the tasks of management even more difficult (Shibani, Saidani, & Alhajeri, 2013).

Consequently, Smallwood (2000) reveals that many youngsters of various countries have received various kinds of training in occupational and health protection in the construction industries but so far Abu Dhabi has arranged no such program. Along with this issue, the ratio of workers to supervisors in the construction industry of Abu Dhabi is not favorable – one supervisor is allocated to guide and monitor too many workers, which pushes up the safety risks on construction sites (Smallwood, 2000). Moreover, in the construction industry of Abu Dhabi sub-contractors are compelled to carry out so many activities that they cannot handle the security and health issues of employees at work. The contractors or the supervisors have many activities at the same time in their jobs, resulting in their exposure to particular hazards. Many assignments are handled by subcontractors and trader, which can lead to workers lacking awareness of the hazards involved, having been left behind on the construction site by a previous trader. The persistent modification and altered nature of the sites to be constructed lead to new threats being created continually in this country.

Furthermore, it has been shown that the employees in this construction industry incessantly alter the site. This is perhaps the main reason that they fail to attend training in the use of equipment and procedures in construction work. To sum up, the rapid deadlines and increased speed required

in completing projects also increases the chance of incidents occurring on construction sites. According to Smallwood's study, the unsafe and anti-health environment for workers in the construction industry can be ascribed to two main factors: the lack of a chance to be trained in the right procedures and equipment and the pressures from employers to complete the construction work very fast (Reese & Eidson, 2006).

According to another group of authors (Maraqa, Sweedan, & Zanelidin, 2016) different reasons still may account for the unsafe conditions for workers in this area. They include troublesome working conditions and unsuitable safety management systems. These are the main reasons, which play their own part in the construction industry of Abu Dhabi. Hence, workers in this industry do not benefit from safety training and a better attitude among the employers. It is the flourishing nature of the construction industry that causes different kinds of accidents, fatal and otherwise (HSE, Casual factors in construction accidents., 2003). But an industry of this nature of requires employers to launch more labour-friendly accident prevention strategies, because the fundamental right of an employee is to be able to go home safely. This leads researchers to recommend further studies in accident prevention. Accident prevention is a major issue in this country, mainly through understanding how people are exposed to such huge risks as work-place injury and damage from falls. Both these risks should be considered differently and managed competently (Alhajeri, 2011).

OSH legislation

This section reviews the laws on occupational health and safety in the construction industry. The focus will be on Abu Dhabi's laws but other countries' legislations will also be touched on.

OSH legislation worldwide

The life of the population is the government's responsibility. In 2011, the former UN General Secretary, Kofi Annan, stated in his visit to Tawiah and Baah that the government should not pay attention to safety as part of its socioeconomic and political development, but rather that safety is a basic human right (Dwomoh, Owusu, & Addo, 2013).

Reducing the number of injuries and fatalities is the objective of every government, but it is easier to do in the developed countries. Today, governments maintain their commitment to this objective, and every government has built up legislation to control its health and safety. This legislation

creates a system that clearly sets out objectives, responsibilities and guidance for the industries concerned (Alhajeri, 2011).

In the UK health and safety regulation dates back 150 years back. In 1974, the Health and Safety at Work, etc. Act (HSWA) was passed clarifying that those who create risk are responsible for managing it. This led to the founding of the Health and Safety Executive (HSE). The practice of safety in the UK is regulated by the HSE. In 2008, it made some important changes in the regulations to ensure a unified and integrated structure and legal framework for health and safety. The HSE enforces regulations in many work-places in the UK, from nuclear installations through schools and hospitals to other fields. The Office for Nuclear Regulations (ONR) is responsible for law enforcement in nuclear installations. At the same time, to ensure the enforcement and implementation of the occupational health and safety regulations on other areas such as the retail and finance, service and leisure sectors, 380 local authorities are assigned (HSE U. , 2013), the HSE takes a mixture of intervention approaches: inspection, awareness, advice and support, and enforcement action when required.

In the USA, OSHA, part of the United States Department of Labour, is the government agency responsible for occupational health and safety aspects. The Congress established OSHA as a result of the Occupational Safety and Health Act of 1970. The objective of OSHA is to ensure a safe and healthy working environment for workers and it is responsible for creating and enforcing OSH standards and regulation. It is also responsible for providing required training, outreach, education and assistance. OSHA covers both the private sector and the public sector in the 50 states and territories and jurisdictions under the federal authority (osha, 2016).

In Singapore, the Ministry of Manpower is the authority responsible for occupational health and safety. It promotes work-place safety and health legislation, policies, practices and awareness programs through the Occupational Safety and Health division (OSHD) at the national level. The assigned division was first reformed on 1 August 2005. Its function is to create an OSH framework. It is also responsible for monitoring the implementation of the Work-place Safety and Health Act in cooperation with the main stakeholders, which include ILO and ASEAN-OSHNET. To achieve its goals, OSHD consists of four main departments with different functions. It takes care of the OSH Policy, Information and Corporate Services Department, OSH Inspectorate, OSH Specialist Department and Work Injury Compensation Department. At the same time, OSHD works closely

with the Work-place Safety and Health Council to develop strategies to raise WSH standards in Singapore. In 2011, the Work-place Safety and Health (WSH) Institute was established as part of the WSH 2018 strategy. The objective of this institute is to strengthen the country's capabilities in building a safe and healthy work environment.

The practice of health and safety in Qatar is regulated by the Ministry of Labour. In the last few years, there has been a need to establish a unified health and safety regime in the country and therefore, in 2011 a National Committee on Occupational Health was established within the Ministry. This Committee is responsible for developing the OSH policy and system; creating the related rules and regulations and mechanism; and developing methods of enforcement. In this regard, the Qatari Labour law issued in 2009 has a chapter (Chapter 11) which presents the subject of health and safety in three different articles (Qatar Labour Law- Chapter 2011, 2009) .

OSH laws and regulations in the UAE

Islam respects work and ensures its value and importance as a form of worship; through lawful work rituals of worship can be enacted. Moreover, Islam connects faith with work. The Qur'an speaks of "those who believe and work deeds of righteousness". Several Hadith (sayings of the Prophet Mohammed, May Allah bless him and grant him peace, also see things from this perspective. The Prophet said, "If the Final Hour comes while you have a palm-cutting in your hands and it is possible to plant it before the Hour comes, you should plant it". This Hadith shows the value of work and its importance in Islam. Indeed, to encourage workers to respect their work, Islam has developed the appropriate legislation for preserving workers' rights and providing safe and healthy work-places which contribute to improved productivity, stability and development.

This legislation, which was developed 1400 years ago, has managed the relationship between employers and employees. Employers and employees should act as brothers in faith and not as masters and slaves. It is to the benefit of all that the employer should be responsible for giving the employee suitable wages and he should not ask him to perform a task that exceeds his capabilities and energy. One of the rights that Islam focuses on is the right to take rest, especially if the workers are engaged in a tiring activity such as building. In this case, employers are not allowed to ask the workers to work so hard as to damage their health. Islam provides workers with all the care and other things that he needs to protect his rights, including providing him with healthy and safe environment and workplaces.

The relationship between H&S and religion is not limited to Islam only, but it covers most of the religions. For example Buddhism which really focuses and pays great concern on environment and to keep it safe. Indeed, the Buddhism believes that hurt not others in ways that you would find hurtful. This belief suggests a moral level of care for others that we are responsible to provide (Smallwood J. , 2002).

The UAE as an Islamic country, religion is a very important aspect of its society. It is the basis of its culture, its political and economic system and way of life. The UAE law is based on the system of civil law, influenced by Islamic laws. In the UAE, the Labour Law “Regulating Labour Relations” was established in 1980, and applies to all the emirates. This law was amended by Federal Law No. 24 of 1981, by No.15 of 1985 and by No.12 of 1986. The Ministry of Labour has the duty of enforcing it throughout the country. It is this Ministry’s responsibility to apply the law at the federal level; however, every emirate can decide its own regulations which should be implemented by the organizations running in it such as the OSHAD Center in Abu Dhabi.

The UAE Federal Law was issued in 1981 after the perusal of Law No 1 of 1972 regarding the competence of Ministers and the power of Ministers and Laws. The Law consists of 12 chapters. The first chapter includes definitions and general provisions. The following definitions were chosen for the purposes of the present research.

In term of workers’ occupational health and safety, the UAE Federal Labour Law makes several provisions which are specified in Chapter 5, “ SAFETY, PROTECTION, AND THEIR HEALTH AND SOCIAL CARE OF EMPLOYEES” in Articles 91 to 101.

Chapter 5 of the Labour Law focuses on the employer’s responsibility to provide the workers or employees with a safe work-place, and protects them against injuries and accidents in doing their jobs. All the articles in this chapter cover the employer’s responsibilities except Article 100 which highlights the employee’s responsibility to adhere to the safety instructions. The following table lists the stipulations mentioned above, which must be adhered to (UAE Labour Law, 1980):

Table 0-1: UAE Labour Law, 1980- Summary

Article	Subject	Required measures and procedures	Responsible
91	Adequate means of protection	Provide the required PPE Wear the required PPE	Employer Employee

92	Fire prevention	Display detailed instruction to prevent fire Have them written in Arabic and other language required	Employer
93	First Aid	Provide one first aid box for every 100 workers	Employer
94	Cleanliness and ventilation	Provide proper cleanliness and ventilation plus illumination, potable water and toilets	Employer
95	Medical checkup	Provide physicians and medical checkups for employees at least once every 6 months and record the results	Employer
96	Medical care	Provide medical care for the employees	Employer
97	Health prevention	Decide the general measures for health prevention applicable and determine other safety measures required	Minister of Labour
98	Dangers and risks	Inform workers about the risks in their work-place	Employer
99	Alcohol	Not allowing alcohol and intoxicated persons at work	Employer
100	Adherence to safety instructions	Following the safety regulations	Employee
101	Facilities	Providing all required logistics for employees working in areas remote from cities	Employer

It is the Ministry of Labour's responsibility to apply the above law at the federal level; however, every emirate can decide its own regulations which should be implemented by the organizations running in it, as is done in Abu Dhabi and Dubai. For example, the industrial sector of the free zones has different health and safety regulations which should be adhered to. Contracting companies working in Dubai also follow the health and safety regulations set by the Dubai Municipality, the Public Safety Unit of the Environmental Protection and Safety Section in the Environmental Department (Al Hajeri, 2011. P. 48-51).

The following section describes the occupational health and safety regulations in Abu Dhabi.

OSH legislation in Abu Dhabi (OSHAD SF)

The government of Abu Dhabi is committed to protecting and promoting human health and safety for all the inhabitants of the Emirate, and its vision is to honor this commitment. This vision depends on effective integration between the government and private entities in the Emirate.

Integration works here to ensure that activities in the Emirate are undertaken in a responsible and safe manner and within an organized OSH framework. Since 2006, Abu Dhabi has taken steps to ensure the right implementation and the building of safe and occupationally healthy work-places.

On 11 June 2007, the executive council of Abu Dhabi established the higher committee responsible for implementing an environmental health and safety management system in Abu Dhabi (EHSMS). The committee was chaired by H.E. Majid Al Mansouri, the general secretary of the Environment Agency in Abu Dhabi at the time. It also included 13 members of federal and government entities in the UAE, such as the Ministry of Health, Ministry of Labour, Abu Dhabi Municipality, Al Ain Municipality, Department of Transport, Abu Dhabi Food Control Authority, Environmental Agency, Health Authority, and Higher Corporation for Specialized Economic Zones, the Supreme Petroleum Council, and the Tourism Authority. Two members of the Abu Dhabi Water and Electricity Authority were added in December 2007 and the new General Manager of Abu Dhabi Municipality. This Committee is responsible for:

- Determining the corporations/entities/government and private projects that could not work in the Emirate of Abu Dhabi without implementing an environmental health and safety management system (EHSMS).
- Ensuring that the above entities are following occupational health and safety standards and working to avoid all occupational and health dangers associated with its activities that might affect its employees and the environment.
- Developing a procedure to review and approve the EHSMS developed by the entities and determining the competent authority responsible for system approval.
- Developing a procedure to audit the entities with the approved EHSMS.
- Marketing for the Environmental Health and Safety Management system among the entities in the Emirate.
- Submitting annual progress reports to the Executive Council.
- Developing an award system to encourage entities to develop their internal occupational health and safety management systems.

The committee is also responsible for formulating technical sub-committees to ensure the effective implementation of the EHSMS in all the sectors of the Emirate, and for supervising the work of these sub-committees.

In 2009, a decree was issued by Crown Prince Sheikh Mohamed bin Zayed Al Nahayan, Chairman of the Executive Council concerning the Environment, Health and Safety Management System in Abu Dhabi Emirate (AD EHSMS).

In February 2010, Executive Council has issued circular of establishment of Abu Dhabi Occupational Safety and Health Center (OSHAD) with a vision of providing a safe and healthy work-places for all in Abu Dhabi. The Center has several responsibilities, including:

- Developing and updating OSHAD SF, and following up the implementation of the system by relevant parties in the Emirate.
- Ensuring the integration between OSHAD SF requirements and the requirement of other relevant parties.
- Setting out a plan to control risks in the work-place and raise the level of OSH performance in Abu Dhabi through building channels of cooperation with all the relevant authorities, delegated as Sector Regulatory Authorities under OSHAD SF and other parties on all subjects related to OSHAD SF.
- Being responsible for reviewing and approving OSHAD SF for other authorities and government entities and monitoring the implementation of OSHAD SF in other entities through inspections, visits and audits. Being responsible also for investigating occupational incidents and injuries.
- Building OSH capacity in Abu Dhabi through providing the required training programs.
- Building an occupational health and safety culture in the Emirate through launching awareness programs which cover such OSH subjects as Safety in the Heat, the OSH day, occupational noise, stress management and other programs. The Center also holds yearly conferences and workshops on OSH.

One of the center's main responsibilities is to develop an integrated OSH management system. This system is designed to build safe and healthy work-places and keep pace with the strategic. Like most international management systems, its main structure consists of mandatory and non-mandatory documents including a glossary of terms, a manual, lists of elements, standards and guidelines, codes of practice, mechanisms, standard forms, technical guidelines, and guidance documents.

The codes of practice (CoPs) are mandatory technical documents. Before 2018, OSHAD SF had 54 codes of practice embodying safe and healthy practices for workers in every sector. Further details of these CoPs are covered below.

To facilitate the best implementation of OSHAD SF in the Emirate, OSHAD has developed two main electronic systems, Qudorat and Al ADAA.

Qudorat is an occupational health and safety registration program which is responsible for electronically registering the entities and people who work in the OSH of Abu Dhabi. The registration in this program requires a comprehensive evaluation of practitioners' competency in the private sectors. Every entity that is licensed to work in Abu Dhabi and plans to practice OSH activities such as OSH consultancy offices, OSH auditing companies, OSH certification bodies, and OSH training provision should apply and register in Qudorat before entering upon this activity. The same rule applies to individuals who want to work in Abu Dhabi as OSH generalists, OSH auditors, and OSH technical specialists (OSHAD, 2010).

OSHAD has developed Al ADAA to facilitate the implementation of OSHAD SF and ensure compliance with its requirements. It is the first electronic application for the management of aspects of occupational safety and health (OSH) in a consistent and uniform manner, and allows for the periodical and annual reporting of OSH performance. The objectives of AL ADAA are to electronically support the management of OSHAD SF operations (Automization). It also aims to establish a unified OSH database in the Emirate. Finally, AL ADAA is responsible for providing accurate data for decision makers. It receives reports from all the relevant parties in the Emirate including OSHAD, the Sector Regulatory Authorities (SRAs), and the government departments delegated by OSHAD to oversee the implementation of OSHAD SF's requirements by the entities in their sector, the Abu Dhabi government departments concerned with the implementation of OSHAD SF requirements, and the entities (companies/establishments) working within the sectors implementing OSHAD SF that have been nominated and notified by their respective SRAs to implement its requirements (OSHAD, 2010).

OSH legislation for construction industry in Abu Dhabi

Safety management is not well developed in most Middle Eastern countries, which is mainly due to the poor administration and inadequate legal system responsible for formulating and monitoring

the enforcement of the regulations (El-Sayegh, 2008). The Emirate of Abu Dhabi has now started to pay attention to safety issues in all the construction activities in the Emirate. Since 2009, the Abu Dhabi government has favored the establishment of an Environmental Health and Safety Management System (EHSMS) for all sectors including the Building and Construction (B&C) Sector (Maraqa, Sweedan, & Zanelidin, 2016). Like the other Emirates of the UAE, the construction industry is the economically strategic sector of Abu Dhabi Emirate. The economic and infrastructural expansion of the construction industry has made it more important to implement EHSMS in building. EHSMS is also important because of the predominance of susceptible workers who have migrated from low income countries (Bhat & Gowda, 2013).

Thus, the construction sector of Abu Dhabi is working under the EHSMS and EHS committee, which aims to develop and implement better and more effective policies and safety measures for construction industry workers. The B&C sector is obliged to provide help and guidelines for working with construction firms and construction employees in Abu Dhabi, in order to improve the industry's EHS standards. The B&C sector is composed of three sub-divisions, namely: a registration and reporting division, a division for inspecting and investigating of accidents, and a support division. The support division aims to conduct training sessions, workshops, marketing, the processing of complaints, maintaining an information technology system and carrying out research and development (Mohamed & Maraqa, 2013).

In the literature, various key features of EHSMS and the EHS committee for the B&C sector have been identified to determine the areas that it must consider for the security of workers in Abu Dhabi's construction industry (AD EHSMS, 2012). The first key feature implies that the B&C sector should work hard to offer a safe environment to workers and to protect the safety and health of employees and society by stopping, lowering and controlling all of the foreseeable risks associated with the EHS in the state of Abu Dhabi (AD EHSMS, 2012). The second key feature is that the B&C sector should ensure the prevention of individual and occupational injuries, occupational illness and environmental pollution, replacing them with safe working, health and safety practices. Along with this, it should manage all of the environmental hazards in the B&C sector, with the main focus on sustainability, danger and risk assessments, and training (AD EHSMS RF, 2012). Another aspect is that the B&C is responsible for the development of a framework for the effective operation of EHSMS policies and for aligning it with all the domestic,

federal and international laws, the codes of practice, and the standards of an effective EHS management system. Moreover, it implies that the B&C sector should continuously work for the improvement of effective EHS management systems by launching and reviewing the EHS objectives (AD EHSMS RF, 2012). Other features include increased awareness of the EHS, training for workers; integrating the economic and social preservation of biological diversity; ensuring the effective and full use of resources to improve the environment, health and safety for employees; and to make sure that the EHS policy for B&C is reviewed periodically to keep it relevant to the EHS policy of Abu Dhabi (AD EHSMS, 2012).

There are so many ways in which safety and health in construction industry is observed, with the aim of reducing the number of injuries and fatalities by lowering the number of accidents in the work-place. Throughout the world, governments are maintaining a continuing pledge to establish a work environment that is free of disease and injury. For this purpose, governments are establishing safety and health legislation for the work-place that sets the work objectives in the form of tasks that aim to encourage safety measures in the construction industry. Countries depend solely on government authorities to maintain health and safety in the work-place. Governments have established particular laws on this theme which protect workers from personal harm by the enforcing of contracts, and setting standards for equipment, installations, and tools (Zaneldin, 2006).

The right implementation of OSH practices and regulations in the construction industry in the Emirate of Abu Dhabi is now regulated by the Abu Dhabi Occupational Safety and Health Center (OSHAD). OSHAD, formally known as Environment, Health and Safety Management System, was founded in 2010 (Al-Khatib, 2012). OSHAD is a leading body for the delivery of safe and healthy occupational conditions in the construction sector of Abu Dhabi. It supervises the process of Abu Dhabi's health, environment and safety supervision system (AD EHSMS). Occupational safety and Health Abu Dhabi help the government authorities to supervise the operation of EHSMS in the private sector. Since its establishment, OSHAD has worked endlessly to implement a complete integrated management system for the occupational security and health of the employees in the work-place. It manages all the aspects of OSH throughout the Emirate in order to help the government's efforts. This can only be attained through the operation of occupational security and health regulatory tools, implementing the best practices worldwide and

by fostering the strategic partnerships with the domestic, regional, federal and the international parties. The long term policy of OSHAD touches every worker and community in the Emirate (Al-Khatib, 2012).

Furthermore, the aim of OSHAD is to identify and control the risk-creating factors and reduce the risks, lower the number of injuries and give all workers a healthy and safe working environment. OSHAD has developed tactical partnerships with other local, provincial and international organizations that can provide a significant amount of help to raise the standards of occupational safety and health. OSHAD is committed to providing enough resources to the entities to maintain its efficient operation through the establishment of workshops, training workshops, site visits, and collaboration with the relevant parties on all the issues associated with occupational safety and health (Sweedan, Maraqa, & Zanelidin, 2014).

In the last 5 years the UAE has experienced a construction boom. The construction industry in the whole UAE is seen as a key generator of employment and income. Due to this extraordinary growth, Abu Dhabi is witnessing the highest increment in the number of its construction projects. But this increase has added to the challenges faced by Occupational Safety and Health, which certainly require study so that an effective implementation plan can be developed to maintain the security and safety of construction workers.

OSHAD-SF - Codes of Practice

The OSHAD-SF Codes of Practice are mandatory subject-specific technical requirements that each entity must comply with, regardless of risk classification. Entities should make themselves aware of the CoPs and the subjects that they cover and identify which relate to them. In 2016, OSHAD drafted 54 CoPs. Appendix I presents the titles and descriptions of all the CoPs, showing whether they are applicable to the construction sector.

For the purpose of this research and to evaluate the level of OSHAD coverage of the CoP, workers' understanding of the system and the CoP requirements, three main areas related to safety are covered in turn below: personal protective equipment (CoP. 2), first aid (CoP. 4), and safety in the heat (CoP. 11).

Personal Protective Equipment (CoP. 2): In the glossary of terms, PPE refers to any device, equipment or appliance – clothing or sunscreen – that affords protection from unfriendly weather

conditions though being either worn or held by an individual to minimize exposure to risks associated with their work-place. PPE comes in the form of eye protection, facemasks and respirators, coveralls, high visibility clothing, helmets, goggles, gloves, protective footwear and gloves, among others.

It should be noted, however, that this CoP does refer to clothing that is worn as everyday corporate wear intended to maintain the corporate image of the organization one works for. Only the kind of clothing that is offered as protective gear against risk exposure of any kind is considered to come under the heading of PPE, and is therefore covered under its requirements.

It also dictates that before employers provide their employees with PPE, they must first ensure that they have protected them from all other risks, in terms of health and safety. PPE, it says, should be one of the last control levels to be identified.

For instance, where PPE is made available to employees, it should be provided at no cost and that the employer should make sure that free training has been given on the proper use of the PPE.

The CoP for PPE is selected for this research because of its importance; it is considered the first personal line of protection against hazards in the work-place (Anigbogu & Tanko, 2012).

First aid and medical treatment (CoP. 4): The First Aid and Medical Treatment CoP is one that applies to all employers within the Emirate of Abu Dhabi and dictates that all workers, employees or other people on the premises should be accorded first aid and emergency treatment.

First Aid is defined as the immediate assistance that is given to an individual after suffering from a sudden illness or injury in their place of work, and that the care is given with the aim of preserving life, or preventing the condition from worsening, as well as, or promoting recovery. This care is called first aid, even when provided by a professional medical practitioner.

The CoP dictates, as a requirement by the Health Authority, Abu Dhabi (HAAD), that individuals who are tasked to provide medical services that go beyond first aid with claims of being professionals in the occupational setting and/or at the employer's accommodation must bear a valid practicing license. Facilities with claims to offer advanced first aid and medical services must also maintain valid licenses as required by the same body.

Before employers implement the first aid requirements, they must undertake a thorough risk needs assessment to identify their needs.

Safety in the heat (CoP. 11): This is a CoP that applies to every employer in the entire Abu Dhabi Emirate whose employees have duties to perform in places where the temperature is high. A high temperature according to this CoP is defined as applying to the weather when the work is outdoors, especially in the summer months, and the site operations that entail the use of furnaces and ovens, amongst other high temperature operations.

Summary

In this review of the occupational safety and health risks in the construction industry of the UAE, it is found that workers face various problems regarding their occupational safety and health. The workers on construction sites are deprived of the basic right of good working conditions and constantly risk accidents because their surroundings are unsafe. Many of the injuries are eventually fatal. Furthermore, the workers are compelled to work without the provision of equipment and PPE needed for certain tasks. Construction work is often very demanding and risky, with heavy machinery, lifters, loaders and other instruments, which may injure workers. Falling from a height also frequently kills workers.

The government of the UAE is paying some attention to the improvement of working conditions but the results of government actions are not satisfactory. The development of the oil and gas industry has also resulted in the loss of life for workers because their working environment is unsafe. The oil and gas industry contains various chemicals for processing by machines which cause various diseases and injuries to the machine operators. Yet the workers from the UAE or from elsewhere in the region are not given training in the handling of such machines on site. The gap I provision remains because of frequent changes in the subcontractors of the company. The haste to complete projects makes the construction work over-hasty and for this reason employees cannot learn to how protect themselves. The government must investigate the risks to the occupational safety and health of workers, who have gone abroad in good faith to gain employment. Better and more satisfactory conditions should be provided for them.

CHAPTER THREE: PERFORMANCE AND ORGANISATIONAL COMMITMENT

Introduction

Over the past 15 to 20 years, the concept of performance has received considerable attention from researchers. To further understand performance, three terms should be explored, namely, performance, performance appraisal and performance management.

In 1988, Brumbrach defined performance as actions and results. Coens and Jenkins (2002) believe that ‘individual performance is mostly determined by the system in which the work is done rather than by the individual’s initiatives, abilities and efforts’. Performance management is considered one of the most important functions of human resource management; it focuses on the required behaviour and the results associated with it (Arakal & Mampilly, 2013).

Why do some organizations perform better than others? The research findings suggest that incentive schemes are among the key factors that motivate employees to enhance their performance (Friedman & Sunder, 1994); (Sprinkle, 2000). But there is also evidence that financial incentives sometimes have a different effect on the performance of employees. The reason is found to be the changing nature of work, and the increased number of knowledge workers due to globalization (Frese & Fay, 2001). So, the question to ask is ‘If financial incentives are not enough for enhanced performance, then what are the non-financial factors and behavioral factors that enhance employee performance?’

The concept of performance has several dimensions and components, and one can distinguish behavioural engagement from the outcomes that were expected. Behaviour refers to the actions that individuals perform to accomplish a task, and outcome in this context means the result of an individual’s job behaviour. Thus, behavioural engagement in the work-place is related to an expected outcome (Borman & Motowidlo, 1993). However, the outcome is also affected by several other factors, such as cognitive ability and motivation. Employee performance as task performance consists of job related behaviour that includes the job responsibilities assigned for the job. Task performance needs cognitive ability and is facilitated through task skills, task knowledge, and task habits. Thus, the basic factors of task performance are the ability to do the job and previous work experience (Conway, 1999).

According to one writer (Tripathy, 2014), task performance in an organizational context is a contract between the leader and the subordinate to complete an assigned job. There are two key elements of entrusted task performance: leadership task performance and administrative task performance. Administrative or technical performance is the expected performance for an assigned job, which consists of the organization, planning, and administration of daily job tasks through technical skills, business judgment skills, and so on. Leadership performance is related to setting goals, developing performance standards, and directing and motivating subordinates to carry out job duties, through recognition, encouragement, and constructive criticism.

In order to learn why some organizations perform better, we should consider other factors in addition to financial incentives for employee performance. Thus, scholars shift their focus from a fixed-task-oriented perspective to a consideration of the different roles and actions of organizations that are aimed to enhance employee performance (Fried, Levi, & Laurence, 2008).

Performance

Performance is a factor of an organization whose existence and enhancement has immense pertinence for all the stakeholders. Performance is not merely a word, but a whole philosophy in corporate world. The entire corporation is based on the performance of the employees and employers. The survival and success of a company is especially closely related to the performance of its employees (Mikolajczyk & Schmid, 2005). If the employees perform well the organization remains well, but if not the organization will face problems and crises. So performance is a pertinent factor for firms, referring to a set of necessary activities or functions that are to be borne by the persons responsible, i.e. managers and employees and others.

In employment relations research, performance has been considered a main variable, but it has received less attention than other variables have. There are two reasons for this; first, research on organization performance tends to emphasise wider systemic issues, such as availability and standards of equipment and resources. The second reason is that researchers are more focused on independent variables while the measurement of performance as a variable is controlled by people other than the researcher. As a result, the concept of performance has been managed by variables over which people have limited control. For example, output is used to measure individual performance, but output is actually a reflection of other variables, apart from individual variables such as the work environment (Poropat, 2002)

Since 1990, studies have paid more attention to defining performance from the point of view of organizational behaviour, inspired by (Campbell J. P., 1993). Generally speaking, performance is different from outcomes because performance refers to the behaviour which a person shows, while output presents the outcomes of certain behaviours. Performance presents the behaviour which is indicated by the actions of people at work, what they are doing. Performance consists of several behaviours. Process and performance should be distinguished from each other, and so should performance and effectiveness, and productivity and efficiency according to researchers (Sonnentag, Volmer, & Spsychala, 2008).

In 1993, Borman and Motowidlo introduced two types of performance: task performance and contextual performance. Task performance describes a worker's proficiency in performing a job that can be classified as part of the technical core of an organization. This job can contribute directly to the firm's objectives, for example, producing a product, or it can be indirect, for example, the sort of work that managers do. Conversely, contextual performance describes jobs that have no impact on the technical core, but contribute by supporting the organizational, social, and psychological environment in which organizational objectives are pursued (Sonnentag S, 2002)

Performance appraisal

Performance appraisal means the processes and methods applied by organizations to assess the performance level of employees, and provide them with feedback. The appraisal process can be used for administrative, as well as developmental purposes. Performance appraisal in organizations plays a vital role in human resource management (Dijk & Schodi, 2015).

The focus of the literature related to performance appraisal until the 1980s was on measurement development. Most of the research studies were concerned with constructing rating scales, improving the tools of performance appraisal, and examining the positive and negative aspects of ratings. However, this trend changed in the 1980s and began to focus on the rated person's cognitive characteristics. Thus, performance appraisal related literature since then has been found to be more concerned with stereotyping, attribution errors, categorization, and other biases related to information processing (Dobbins, Cardy, & Truxillo, 1998).

Another development in the literature related to performance appraisal occurred during the 1990s. Several researchers found that cognitive process models were unable to narrow the gap between research and actual practice. Moreover, as the appraisal process is conducted in a social context, the context for the process has to be understood. The performance appraisal process can fail if those who are appraised consider it manipulative (Levy & Williams, 2004). Many research studies have focused on finding appraisal techniques that can be used for positive outcomes. Multisource appraisal is one of the techniques that have been used extensively in the last two decades. In this technique, the appraisal is not dependent on one source, such as a manager, but on many other sources, such as peers, managers, clients, and subordinates.

Some researchers have reported improved employee performance after multicourse appraisals. For example (Brett & Atwater, 2001) argue that the purpose of a multisource appraisal is to nurture employees and enable them to achieve their job goals and qualify for promotion. Thus, the use of multicourse appraisal improves employees' performance. However, some researchers, such as Smither, London & Reilly have found that multicourse feedback has very little effect on performance (Smither, London, & Reilly, 2005). A very difficult issue in performance appraisal is the delivery of the negative feedback to employees, who naturally find it hard to accept. It makes them unwilling to cooperate; and their performance may be affected negatively. However, employees' reactions to negative feedback vary depending on differences in regulatory focus, self-esteem, performance history, and goal orientation. Thus, managers should take these factors into account when providing negative feedback to employees. DeNisi & Pritchard state that appraisal data should not be used for any other purpose than development. However, if managers need to use these data for another purpose, they should inform employees, because a performance appraisal system cannot succeed without trust between managers and employees (DeNisi & Pritchard, 2000).

The appraisal of workers' performance is a very important function in managing human resources, for it evaluates work done on the basis of performance. The management checks whether the work or performance is up to the mark or not and can then decide to incentivize workers. Such appraisal can be traced back to 1914, when the US army began formally to evaluate the performance of its officers in the First World War. In 1920, US Officers in the army were rated according to their performance and this practice later shifted to the UK (Armstrong & Ward, 2006).

During the 1930s, appraisals was connected to promotion. By 1950, supervisors had started to give feedback on their employees' performance. At this time, the feedback focused on workers' personality traits rather than their performance. Later, supervisors' feedback concentrated on job performance against organization objectives (Waal, 2007).

Many studies have been conducted on performance appraisal, often with a negative verdict.. For example, in 1994, Thomas B. Wilson found that appraisal did not work for the employees or for the organization either but led to the expiration of dissatisfaction. Similarly, Wendy K. Soo Hoo in 2004 showed in her research that 90% of employees found performance appraisal to be ineffective. The reasons for this, she deduced, was that supervisors avoided direct criticism of their subordinates in the appraisals, which led to conflicts or issues. The above studies suggest overall that performance appraisal does not add value to organizations, and those organizations that depended on appraisal for rewarding and promoting employees did not get the required results (Shah & Aslam, 2009). Nonetheless, the present study will evaluate the performance of workers in the construction sector and their knowledge on the OSHAD requirements for their performance.

Performance management

The above discussion on performance appraisal shows that performance appraisal may lead to a decline in organization performance. Besides, researchers have suggested that performance management of the work is a system that may lead organizations to reach their objectives by using fully skilled workers (Shah & Aslam, 2009).

The term 'performance management' was first introduced into the literature in 1972 by Warren, who described the features of performance management as follows: expectations, skills, feedback, resources and reinforcements (Arakal & Mampilly, 2013). According to Warren, performance management is divided into steps. The first is to set the organization's expectations or objectives. The next is to decide which skills are required to meet those expectations. The third is to allocate a team and resources, and monitor, train and ensure compliance and reinforcement. In 1976, Beer and Ruh defined performance as employees implementing different tasks, gaining experience and receiving training and feedback from supervisors.

According to (Jain & Gautam, 2014), successful organizations make performance their key focus. However, in the era of increased competition and advanced technology, competitive advantage has

become particularly important for organizations. Thus, to improve their organizational performance and competitive advantage they need to revise strategies that include employee performance management. Some companies remain ahead of other companies because their performance management plans help employees to understand that managers expect that employees' behaviour will be aligned with the strategic goals of the organization. Thus, in order to implement successful performance management systems, all employees should know their role in the organization. It is possible to enhance employees' contributions to attain the organization's goals if the employees understand what kind of output and performance is required from them and what they have to do in response.

In the past, the concept of performance management was limited to determining wage levels. Performance management was used to shape the employees' behaviour in line with certain specific organizational goals. However, this reward-driven method of performance management was suitable for only a few organizations. Thus, the focus of managers responsible for performance management shifted towards ways of bringing the organizational environment and learning to workers' attention. At this time, organizations found performance management a major challenge (Rounok & Parvin, 2011).

It was stated that performance management systems cannot be developed or implemented in an organization without taking human behaviour into consideration, because behavioural factors will affect the performance management system. Thus, those who design and implement a performance management system should consider culture and behaviour (Simons, 2000). Researchers (Beardwell, 2010) list the steps of performance management in his research, as follows:

- Setting goals, such as individual or organizational goals for the performance management system,
- Developing schemes and reward strategies,
- Compiling development and training plans,
- Coaching, communication, and feedback,
- Career planning for individuals; and developing a mechanism for monitoring the effectiveness of the performance management system, and
- Formulating policies for culture management and intervention

Performance management has been presented as a tool for enabling managers to effectively manage employee performance. It obliges managers to make sure that employees know what is expected and they are capable of meeting these expectations (Armstrong & Baron, 2004). It also means that they are supported by management in developing their ability to meet the expectations that are disclosed in performance feedback. It is not clear whether a performance management system is important for organizational performance, for instance, in helping organizations to pursue their organizational objectives and vision, aligning the goals of employees' performance with the strategic goals of the organization; and ensuring that employees clearly understand performance expectations. Thus, performance management improves the performance of employees, finds talented people for promotion; and develops the link between employees' pay and performance (Helm, Holladay, & Tortorella, 2007).

In the literature are a number of models to explain performance management, which are important for managing organizational performance and employee performance, and for integrating the management of both employees and organizations. Performance management has several levels of analysis and is closely related to performance appraisal. Different organizations use different terms for performance management activities, such as pay for performance, performance based budgeting, programming, planning, and budgeting. In fact, a performance management system is believed to integrate human resource management activities with the objectives of an organization, where human resource activities and management work together to support organizational strategy by affecting behaviours (Macky & Johnson, 2000).

Both internal and external factors are key to performance management in an organization. The former are internal resources, management commitment, and leadership's commitment to the employees, a performance-oriented culture, and the maturity of the performance management systems. The external factors include citizens, officials, labour unions, and legal requirements (Sole, 2009). Employees consider the performance monitoring systems as intended to make them work hard; and managers consider such systems as efforts to pressurize employees to enhance performance by working hard. It is argued that the employees of an organization are its most valuable assets. Thus, if managers want rapid growth, they should pay particular attention to the organization's human resources. The gap between the skills and competence of employees in the organization and the required competence is difficult to locate and reduce. If the firm is to gain a

strategic advantage, managers must be able to identify the required competencies in employees from the time they enter the organization till the time they leave (Bhattacharjee & Sengupta, 2011).

A successful performance management system, according to the literature, must at least have the following elements:

- 1- A management philosophy: this together with a shared view of the importance of a performance management system should have great impact on the success of the system. Shan & Aslam measured and assessed the impact of implementing performance management on the productivity of employees in private and public banks. The impact was significantly higher on the productivity of private banks than on the public banks' productivity. One reason behind this was that the private banks' management was serious about implementing the newly developed system, whereas the management of the public banks was not (Shah & Aslam, 2009).
- 2- Organizational behaviour: performance management also focuses on the aspect of the required behaviour. Organizational behaviour involves identifying, explaining, clarifying and developing the behaviour of individuals within the organizations (Kaifi & Noori, 2010). Performance-oriented behaviour should be considered when developing individual behaviour in the organization. Behaviour should be analyzed and modified and monitored consequently till the required behaviour is established (Mishra & Sahoo, 2015; Shah & Aslam, 2009).
- 3- Workers expectations: the literature has focused on the importance of workers' expectations in implementing a performance management system. Including employees' expectations can build a positive two-way relationship between performance management systems and employees (Mishra & Sahoo, 2015).
- 4- Other factors suggested by Mishra and Sahoo (2015) include:
 - Designing an effective performance management policy and framework
 - Getting to know and recognize the job functions of all the employees
 - Understanding the relationship between employees' jobs and the organization's objectives
 - Defining performance measures
 - Observing employees' performance on a daily basis

- Measuring employees' performance
- Reducing / getting rid of issues that hinder or prevent effective performance
- Coordinating between supervisors and subordinates in improving performance

Using performance management systems has many advantages, such as the financial impact. Organizations that use this system may perform better than other organizations which do not (Nankervis & Compton, 2006). A study has also suggested that of all aspects of human resources, performance management has the greatest effect on company performance (Whitford & Coetsee, 2006). From the above, it can be seen that paying attention to the performance of workers may contribute positivity to the outcome for the company. Several factors affecting the workers' performance in the company come under the heading of OSH aspects.

Theories and models of performance

Campbell's Model of Job Performance:

In 1993, Campbell defined performance as any actions or behaviours taken by a worker that has a relationship to the organization's objectives. These objectives or goals entail value judgments and the organization is the authority that decides on them. Performance is not the result or outcome of action, but can be described as the action itself. According to Campbell, performance is multi-dimensional and has three direct components with different inter-correlations with other variables. He summarizes the relationships by the formula:

$$PC = f(DK, PKS, M)$$

where PC stands for the job performance component; DK is declarative knowledge; PKS represents procedural knowledge and skills; and M is motivation.

Declarative knowledge (DK) is knowledge about facts and things. It also presents individual understanding of the requirements of a given task. Such knowledge includes facts, principles, goals, and self-knowledge.

The second determinant of job performance is procedural knowledge and skills. This kind of knowledge reflects how much a person knows how to do something and includes cognitive skills, psychomotor skills, physical skills, self-management skills, and interpersonal skills.

Motivation is the last component; it which describes the choices that someone makes: to perform at all, to use a certain level of effort, and to persist in doing so.

In 1990, Campbell introduced an eight-factor performance model to capture all the dimensions of job performance. The eight factors are: task specific behaviour, non-task specific behaviour, communication, effort, discipline, helping out others, leadership components, and managerial task. According to this writer, the performance of a job is an individual-level factor, and is distinct from organizational performance (Campbell, 1990).

As explained by other researchers, the behavioural aspect refers to what individuals do at work. Performance concerns specific behaviours, such as the sales conversation of a salesperson with customers. This means that all actions that can be measured are considered as performance. In addition, the concept of performance describes the behaviour that organizations hiring someone can expect from him/her (Sonnentag, Volmer, & Spsychala, 2008).

Campbell's model shows eight main elements. Three of these are common to all jobs, namely, job-specific task proficiency, maintaining personal discipline, and demonstrating effort. The other five elements are facilitating peer and team performance, non-job specific task proficiency, communication task proficiency, supervision and leadership, and finally management and administration. These five elements present the performance components: declarative knowledge, procedural knowledge, and motivation, as shown in Figure 3-1.

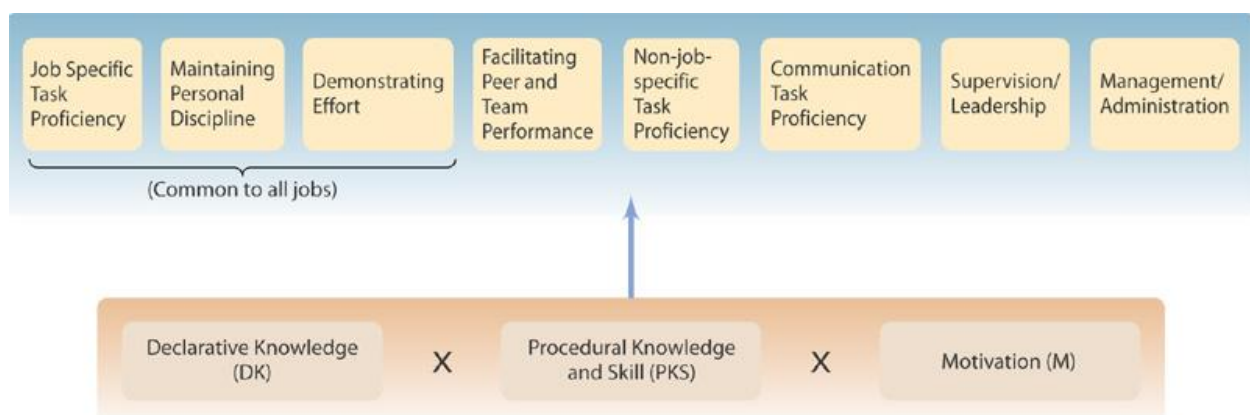


Figure 0-1: The Full Campbell Model

Source: Based on Campbell, McCloy, Oppler, & Sager (1993).

The Campbell model suggests that by holding other constraints constant the situation can affect individual differences in performance only by influencing DK, PKS, or M (McCloy, Campbell, & Cudeck, 1994; Muchinsky, 2006). In terms of OSH, the awareness and knowledge gained by following and implementing the regulations and requirements of OSHAD SF may affect the performance of workers.

Expectancy Theory of Motivation

Expectancy theory is focused on the cognitive antecedents that are related to motivation, and their relationship with each other. Thus, expectancy theory is a motivation theory based on the cognitive process, and it developed from the idea that people believe that their performance in the workplace results from their efforts. People are more willing to work hard if they believe that their efforts will result in improved performance, and performance will attract the desired rewards (Lunenburg, 2011). Expectancy theory makes four basic assumptions. First, people have expectations about their motivation, needs, and past experience when they join an organization. Second, the behaviour of an individual is the result of conscious choice. Third, different people have different expectations of the reward from organizations. Fourth, people choose from a range of options in order to optimize results (Vroom, 1964).

As explained by Parijat & Bagga (2014). Expectancy theory helps in developing a mechanism for discovering motivation by particular calculations. Individuals have personal goals that they want to attain. They work in organizations in order to receive rewards for their work with which to attain these goals. Thus, people must understand the relationship between their personal goals and their organizational rewards in order to find how far the organization is meeting the employees' personal goals by its rewards; and how attractive are the rewards that the organization offers. The relationship of organizational rewards and personal goals is expressed in the form of the value that employees give to their work outcomes. Moreover, the organizational rewards depend on employees' performance and the employees' perception that their effort will result in rewards. In short, there are four key elements of employee motivation:

1. The employee's individual effort

2. Personal goals
3. Individual performance
4. Organizational reward

These four elements develop three relationships: that between the employee's effort and his/her performance; that between employee performance and work outcomes; and that between work outcomes and personal goals. One might expect this to apply to construction site staff's relationship with OSH. On this supposition, expectancy theory is used in this study to test the views of the workers on the OSH management system.

Personal Construct Theory

The personal construct theory was developed by George Kelly in 1995; and thoroughly revised and developed since then. It has been applied successfully to several research fields. It is a constructive theory whose purpose is to explain the beliefs of individuals and their world view based on their personal constructs. People's relationships provide the grounds for predicting their judgments and behaviours. The key advantage of personal construct theory is that it explains the tacit knowledge that individuals use in everyday life. Kelly believed that the human need to control their situation is the basis for human activity. People feel a sense of control when they understand the events that have occurred and can predict on the basis of experiences what may happen in the future. The need to anticipate events and control the environment is a highly motivating need (Paszowska-Togacz & Kabzinska, 2012).

According to Kelly's personal construct theory, therefore, individuals are active scientists who analyze reality, look for patterns, make hypotheses, calculate and build theories based on their experiences.

Adam's Equity Theory of Motivation

According to the equity theory of motivation, the perception of the motivational level of an individual is co-related to what s/he perceives about fairness, equity, and justice. The higher the perception, the higher the level of motivation. Equity theory focuses on both the input side and the output side. An individual compares his job inputs with its outputs. If s/he feels that these are unequal, s/he will try to correct it by reducing the quality of the work or by lowering productivity.

Moreover, inequality can result in resignation from the organization, or increased absenteeism (Greenberg, 1989).

The key focus of equity theory is human motives, and it can be used to account for organizational behaviour. In tackling simple tasks to do with employees, such as promotions, pay, or recognition, as well as, in case of improvements, training, and development, human resources managers need to consider equity theory. It can help managers to explain the behaviour of employees and to identify the factors that lower performance and efficiency. Equity theory has been considered important by human resources professionals with particular focus on the fairness of outcomes. Research suggests that equity or inequity is the main concern of labour, industry, and government (Al-Zawahreh & Al-Madi, 2012).

The table below summarizes the theories that have contributed to understanding performance:

Theory/ model name	Researchers	Year	Important Points
	Maslow and Herzberg		Look at the relationship between internal needs and the resulting efforts expended to fulfill them
Expectancy theory of motivation	Victor H. Vroom	1964	<p>Individuals may act in a certain way because they are motivated by the fact that this behaviour will bring about a specific result. it is also assumed that behaviour is the result of people's desire to gain something at a high level and avoid pain.</p> <p>People's behaviour and performance is related to motivation.</p> <p>People's efforts and performance are related to their motivation.</p> <p>Some factors that affect performance are personality, skills, knowledge, experiences and abilities.</p> <p>This theory depends on three main variables: Expectancy, Instrumentality and Valence.</p> <p>Expectancy: more effort will lead to more performance Instrumentality: good performance will lead to a valuable outcome Valence: what a person places upon an expected outcome</p>
Personal construct theory	Borman	1987	
Adam's Equity			

theory of motivation			
Campbell's Model of Job Performance	Campbell	1990	<p>According to Campbell's model, job performance has three determinants: declarative knowledge, procedural knowledge and skills and motivation.</p> <p>The model also has eight specified basic performance components. The first three are common to all jobs:</p> <ul style="list-style-type: none"> - Specific task proficiency - Maintaining personal discipline - Focused effort - Facilitating team performance - Non-job specific task proficiency - Communication task proficiency
	Murphy	1994	The taxonomy of job performance was proposed and developed for the US Navy by Murphy (1994). This model is significantly broader and breaks performance into only four dimensions.
The model of Viswesvaran et al	Viswesvaran et al	1996	<p>This model holds that every practical important variation in performance will have been recognized by someone from the employment relationships or the organizational behaviour.</p> <p>The model also suggests ten dimensions for performance, namely:</p> <ul style="list-style-type: none"> • Productivity • Effort • Job Knowledge • Interpersonal competence • Administrative competence • Quality • Communication competence • Leadership • Compliance with authority • Overall performance <p>(Poropat, 2002)</p>
	Varan and Ones	2000	<p>Their model is built on that of Binning and Barratt, which was developed in 1989.</p> <p>The model suggests that performance dimensions have been designed for specific tasks or are related to work generally. So, according to these writers, performance dimensions are either stand-alone measures or as a combination of measures</p>
			that cover a high percentage of the total performance variance of the workers (Poropat, 2002).
Performance model based	Borman, Penner,	(2001)	The model of Borman, Penner, Allen and Motowidlo is based on two types of performance:

on two factors	Allen and Motowidlo		<p>1- Task or technical performance, which describes the activities that may or may not relate to the transformation of resources into products. Task activities depend on knowledge, skills and abilities, and prescribed roles.</p> <p>2- Contextual or citizenship performance, which covers activities that impact on the continued interpersonal and psychological environment that allows the technical and task activities to take place. These activities are more motivational and predisposition activities such as personality.</p> <p>This model is based on a previous model developed by Borman and Motowidlo in 1993 (Poropat, 2002).</p>
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Table 0-1: Summary of theories that have contributed to the understanding of performance

Performance indicators - criteria to measure workers performance

According to social exchange theory, workers may feel more committed to their work, and are willing to perform better in a work-place where they feel that the organization appreciates their efforts (Kayank, Toklu, & Toklu, 2016) . If workers feel that they have no important and valuable role in the organization, their attitude will be different. The theory focuses also on the term ‘reciprocity’, which suggests that there is an exchange between employees and employer. If the organization shows respect and appreciation for the employees’ role and contribution, the workers in return will perceive that the company supports them and cares about their health and well-being (Markic, 2014). This theory applies more to employees with high self-esteem than to those who are in great need of approval and recognition. In conclusion, under social exchange theory, when the organization invests more in the health-promoting practices and workers’ well-being, this is reflected in workers being attracted and committed (Kayank, Toklu, & Toklu, 2016).

It has been explained that performance measurement systems are used to track performance measures with the aim of assessing employee performance and enhance organizational accountability, performance, and decision making. There are three key components of a performance measurement system: data collection, data analysis, and action. It is the responsibility of managers to communicate the organization’s goals and strategy to the employees, and to highlight performance measures within this framework. Performance indicators are the measures that provide information and allow comparisons to be made with particular standards. Thus, it is

important to define performance indicators clearly so that they can be used for performance comparisons in the coming years (Markic, 2014).

Performance indicators are measurable values that show the effectiveness of performance for achieving organizational goals. Key performance indicators (KPIs) are used as landmarks that help organizations to understand the relevance of employees' and managers' performance of their duties; and the outcomes to be gained. KPIs can be chosen or predefined by the management of the organization in order to assess the level of competence. There are a number of advantages to organizations from using KPIs, such as

- Improvement in the response time to market change
- Identification of the costs that can be reduced
- Optimization of the workforce
- Improvement of the ability to manage the supplier portfolio
- Identification, and prediction of future revenues and capitalization opportunities, and
- Evaluation of the workforce through reports on personnel-related costs (Stan, Marascu-Klein, & Tecau, 2012)

Employees' relation with their organization can be measured in several ways. For example, the emotional bond described in their affective commitment is considered one of the main determinants of dedication and loyalty. Studies have examined this relationship, covering such variables as commitment, employee turnover, absenteeism and so on. The following paragraphs review the literature on some of these interrelationships.

Commitment

Commitment is the pledging or binding of an employee to a set of behaviours and the motivating of this employee to act accordingly. Nowadays measuring the improvement of performance in an organization has gone beyond the effects of leadership and management performance and engages with the level of the employee's emotional commitment. Commitment is the factor that differentiates between average and top performing organizations. When employees feel that they are emotionally engaged, their productivity increases and becomes more customer-focused, which has a positive impact on the organization's financial performance (Fornes & Roco, 2004). This shows that in order to meet their socio-emotional needs and to evaluate the organization's readiness to reward increased effort, employees form general beliefs concerning how much the

organization appreciates their contributions and efforts and cares about their well-being and health (Rhoades, Eisenberger , & Armeli, 2001).

In 1997, Meyer and Allen developed a three-component model of organizational commitment. The model consists of Affective Commitment (AC), Normative Commitment (NC), and Continuance Commitment (CC). The commitment which is presented as a relationship or a force that connects an employee with a course of action linked to one or more targets is established on the above three bases or mindsets (Jaros, 2007). According to Allen and Meyer, affective, continuance, and normative commitment refer to different dimensions of the same phenomenon.

The affectively committed employees are those who have a sense of belonging and are involved in various organizational activities. At the same time, they are working hard and are have willing to follow the organization's objectives. They are also willing to stay with the organization for some considerable time (Rhoades, Eisenberger , & Armeli, 2001). There are two levels of commitment: (a) Organizational commitment, and (b) Individual employee commitment. The first type is directed by the organization's attributes and is defined by the relationship of the employees to it plus their attachment to the organization. The second type is connected to the individual attributes and defined by the employees' attachment to their job, career, team, colleague or supervisor (Fornes & Roco, 2004).

The continuance commitment is a commitment in which workers identify their investment in the organization and cost and alternatives which are associated with leaving it. This is the positive relationship between continuance commitment and organization commitment. If the continuance commitment is high, then the employees will stay with their organization (Khan, Naseem, & Masood , 2016).

Normative commitment refers to the employees' sense of loyalty or moral obligation to the organization (Ortiz & Lau, 2011).

Generally speaking, affective commitment reflects the employees' affection for their job, which occurs when they feel a strong emotional attachment to their organization, and to the work that they do in it. Continuance commitment arises when employees consider the pros and cons of leaving the organization. They may feel that they need to stay with the company, because the loss they will experience by leaving it is greater than the benefit they think they might gain in a new

role. Finally, normative commitment shows the sense of obligation to stay, even if the employees are unhappy in their role, or if they want to pursue better opportunities. These different types of commitment are also differently affected by different factors.

Numerous researchers have found a link between human resource practices and employee commitment. Among many factors that have been shown to influence commitment, some important ones are employee empowerment, communication, employee involvement, participation, and organizational trust (Mayfield & Mayfield, 2002). The method that is used to make employees aware of the goals of the organization, and the importance of their roles and involvement for attaining these goals plays an important part in employees' commitment and performance. Communication has a major link with commitment and performance. Moreover, employee participation in decision making has a positive relationship with commitment. Organizational trust has a significant effect on employee commitment. In fact there is a close relationship between employee involvement, organizational trust, and information. For example, role clarity is related to the feeling of belonging that is linked to effective employee commitment (Hartmann & Bambacas, 2000). Most studies have demonstrated a positive relationship between OHS, commitment and performance. In this study commitment is used as a predictor of OSH knowledge uptake. This study will cover the relationship between applying OSHAD SF requirements and the workers' commitment.

Absenteeism

Absenteeism is one of the greatest problems of today's corporate world and contributes to the great loss in firms' profitability and the national economy. Organizations are struggling to find ways of improving attendance and reduce absenteeism among workers. For this purpose, various studies have sought to discover the factors leading to absenteeism (Hanna & Awad, 2005). If they knew what the factors were, companies would provide incentives and use strategies to encourage their employees to attend. The firms realize that their goals are still distant while absenteeism persists and have therefore defined policies such as salary deduction and the loss of bonus provision for those who absent themselves too often.

Studies have argued that absenteeism in most organizations is controlled by legal regulations to instill discipline. However, the approach of most organizations to their employees has changed significantly. Organizations nowadays care more about their employees, so employee satisfaction

and commitment have a better chance to be taken seriously. Researchers argue that because absenteeism is an important determinant of competitiveness and productivity, it should be managed in the same way as other determinants. There are two main objectives in analyzing the factors of absenteeism: first, it will enhance the effectiveness of the organization by finding the organizational and economic factors that should be blame ; and, second, but equally important, it will help organizations to make the working conditions correspond with the employees' needs. Thus, the main idea for reducing absenteeism has been to optimize the relationship between managers and subordinates, and to optimize the economic and social environment developed by the organization. Building these improvements is a major challenge for the management of organizations (Koziol, Szkola, & Koziol, 2016).

According to (Beesley, 2013) one of the important ways of preventing sickness from being used as an excuse for absenteeism is the proper development of conditions and relationships in the workplace; and the organization's management of absence due to sickness. The researcher argued that attention had to be paid to an absenteeism policy, particularly to the rules for taking time off work, the acceptable length of a period of absence, and the consequences of not following these rules. A study suggests that absenteeism responds to the programming, planning, and controlling of the actions and policies that are aimed to increase the well-being of employees in order to improve business performance. It was concluded that an interdisciplinary approach that integrates different perspectives and spheres would help to understand the problem of absenteeism (Koziol, Szkola, & Koziol, 2016) .

Absenteeism is described, from the management perspective, as an unplanned event and sometimes as a disruptive one. At work, absenteeism occurs when an employee is scheduled for work, but is recorded as not attending. Another researcher has defined absenteeism as the sign of a withdrawal attitude built in order to escape from an unwelcome working environment. Moreover, studies have shown that between 50% and 60% of all lost working days are associated with work-related stress. This shows up as a huge loss both for people's performance and for the economy (Milczarek, Schneide, & Gonzalez, 2009).

Absenteeism in this study is used as a proxy to check if the inadequacy of the OHS management system can discourage workers from turning up for duty. This study will cover the relationship

between applying OSHAD SF requirements and absenteeism among workers. Theories suggest that there is a negative relationship between the two variables.

Work Alienation

The term 'alienation' is Latin in origin. It was initially used to describe, in theological terms, the separation of humanity from God when Adam and Eve were banished from Eden. Since then, different researchers have studied the alienation and used it to describe how people may become estranged from social and political life, their work, and even from themselves. Marx explained that workers may feel alienation when they have no power of decision over the design and production of their work. Recent studies have focused on perceptions of decision-making autonomy because it indicates a level of freedom, independence and discretion in workers who can schedule their own work and decide on the procedures to be used. Researchers have found that autonomy is positively related to job behaviour (Shantz, et al., 2015).

According to (Tummers, 2013) alienated employees can face different dimensions at work, but other conditions can cause alienation. When an organization downsizes it negatively affects employees' commitment. As a result workers become more alienated. Other reasons for alienation are restructuring, organizational downsizing, increased pressure to focus on performance, and technological change. Moreover, the application of cost reducing techniques can also reduce the levels of commitment among employees, resulting in alienation. Some part-time employees, too, may feel alienated because of feeling inferiority to full-time employees. In addition, the increased use of outsourcing and lack of training of employees can result in alienation.

Work alienation has been found to negatively affect the attitudes of employees to their job duties and job performance. Work meaningfulness can negatively affect their organizational commitment. Thus, when a worker feels alienated, it harms their commitment to work. Meaninglessness has also been considered to have a negative effect on work done to benefit one's family. When workers feel their job tasks to be meaningless, the spillover effect from their workplace to the family goes down. Thus, if they feel they are powerless and doing meaningless and tasks, they will reduce their work effort. When workers feel their work to be meaningless, they are less motivated to work hard in the course of their duties. Thus, work meaningless can strongly affect employees' commitment to the organization, their work efforts and commitment to it, and their work to benefit the family (Hirschfeld & Field, 2000).

As stated by (Lakshmi, 2013) alienation can be prevented by managers giving support in the form of training; however, not all employees should get the same support, since their problems are diverse. Solutions from management should be pursued when they take particular care of employees whose level of performance is higher. In other words, to prevent alienation, managers should select the employees who claim to be committed to the organization's goals, and to promoting the beliefs of the organization.

Health and safety officers in organizations could add value and resolve the issue of (work alienated) weakness experienced by representatives. Studies have suggested that human resources strategies and policies should focus on health and safety, communication, team work, involvement, participation, cooperation, developing a safe working environment, and giving employees a chance to participate in the decision-making process. If they did, it would decrease the percentage of employee absenteeism and turnover. Otherwise, when a company gives employees no chance to join in decision-making or does not support its employees effectively, the loyalty and reliability of the employees fall and work alienation rises (Sulu, Ceylan, & Kaynak, 2010). Work alienation is shown to have a negative relationship with performance. This could suggest that inadequate OSH management can lead to workers' alienation, resulting in negative attitude to performance. This study covers the relationship between applying OSHAD SF requirements and workers' alienation. Theories suggest that the two variables are negatively related.

Relationship between OSH and workers' performance

High productivity is considered one of the main objectives for any construction company. Increasing productivity will help to finish projects more quickly, at lower cost and with more profit. Many factors may enhance productivity and help to finish work before the deadline, such as employing the latest technology and machines, planning better, and proper training for supervisors and workers. Another factor that may lead to increased productivity is maintaining OSH (Christian & Michael, 2009).

The human factor is the main factor in any company and in the production process; therefore, a company should pay attention to the OSH aspects. OSH provides workers with a sense of security in the performance of their work. Many studies show that OSH provides workers not only with security, but also with satisfaction. Studies have also found that employees who work

in a satisfactory and secure environment will also have fewer accidents. OSH policy targets both physical safety and workers' performance (Yusuf, Eliyana, & Sari, 2012).

According to (Muchemedzi & Charamba, 2006) occupational health is a science related to work and its environment; and workers' health and safety has a close relationship with organizational productivity. Health and safety is mostly measured by such negative outcomes as illness or injury in the work-place. However, these measures are not perfect indication, because an incident of injury should not imply that the work-place has no safety system. In some work-places, more attention is given to negative outcomes or accident prone areas, but safety should be taken seriously before an accident occurs. The above researchers argued that there is no single reason for accidents; they result from a number of contributory factors. For example, accidents do not always occur in an unsafe situation. Of course accidents to people only occur when people are present. It is unsafe practices and poor attitudes that result in work-place accidents, as do materials and equipment in an unsafe condition.

Accidents in the work-place bring suffering and pain to the families of workers. If an accident results in disability, the results are disastrous for the worker and his family, and the organization as well. He loses his capacity to earn and enjoy life. Moreover, the organization loses his contribution of skills and abilities. The above researchers stated that a change of workstation can result in increased productivity, but this change does not always ensure an improvement in occupational health and safety standards. In fact, new machinery in the work-place can be hazardous for workers. For instance, the organization may replace a noisy machine with a new quieter one with more productivity, but it may produce dust. Therefore, any shift from an old machinery to another may increase productivity but can have OHS implications (Hrymak & Perezgonzalez, 2007).

Researchers have proposed some solutions to improve OHS in the work-place. According to the above writers, most statutory occupational health and safety instruments mention that the employer is responsible for a safe working environment for employees. This means that the employer has a duty to keep records of accidents and disclose them. Employers are also responsible for informing employees about the dangers related to their work-place, and their job roles. It has been suggested

that information about the dangers related to a machine should be posted in areas where employees can read them (Katsuro, Gadzirayi, Taruwona, & Mupararano, 2010).

There is an especially close relationship between the OSH and the performance of workers in construction companies. Performance depends entirely on the health of individuals and workers. If the workers are healthier they can make a big contribution but if they are not cared for by the companies then they can show poor performance (Zacharatos & Iverson, 2005). Construction is an occupation where workers need extreme occupational safety because it is risky work. The probability of accidents in any construction operation brings a high risk of death or other harm to the workers. Furthermore, the work itself is very demanding work, needing much strength of body and effort, which sometimes weakens the body and creates health problems.

At the same time, well-implemented OSH, and developing OSH programs that include occupational health and safety regulations, supervisors and safety practices for workers and other people make workers more aware of their surroundings, so they can avoid accidents. This all enhances productivity and makes the employees feel that they are in a safe work-place, which will motivate them to do their work better (Veltri, Pagell, Behm, & Das, 2007). A study was conducted on employees in the production department at PMR located in Segoro Madu Street, Gresik, Indonesia. The objective of this study was to examine the relationship between OSH and job performance. It was found that a satisfied employee gives a good performance. The workers are willing to work better and enthusiasm if they are satisfied with their working conditions (Yusuf, Eliyana, & Sari, 2012).

Fernández-Muñiz & Vázquez-Ordás (2007) stated in their study that OSH and workers' performance have a positive relationship with each other; improvements in occupational safety and health will result in improved employee or worker performance. Moreover, these authors asserted that the management should provide occupational safety in the work-place in order to keep the workers healthy and motivated to achieving the organization's goals. The company should provide construction workers' clothing or training. In addition, safety helmets and related items should be given to the employees. The workers should be provided with health facilities and other protection while at work. To motivate the employees, they should have collaborative time schedules. It can be said that performance is heavily dependent on working conditions,

occupational safety, enforcement of the labour laws, etc., which can improve employees' performance.

Personal traits

The performance of a worker varies from one to another. Several factors may affect this performance. For years, researchers were trying to figure out the main personality traits that were most desired in the work-place and whether there were any specific criteria for distinguishing good traits from less good ones. Some employers might prefer conscientious employees, while others might prefer more open-minded workers, thinking that such people would be more likely to accept change and being directed.

Personality traits can be described as the main drivers of a person's behaviour. This section will highlight the main theories of personality. It will cover also the relationship between personal traits and performance.

Personal traits definition

To understand personal traits, three definitions needed, of personality, traits, and characteristics.

What is personality? The word 'personality' originated from the Latin word 'persona'. A persona is a mask that Greek and Roman actors wore in classical dramas. They wore this mask to show that they were playing a role or presenting a false appearance. Of course, psychologists have developed this definition and they will not accept a definition of personality as the role that people play. However, every personality theory defines the word differently, because each sees personality from an distinct reference point. In their book, Feist and Feist describe personality as "a pattern of relatively permanent traits and unique characteristics that give both consistency and individuality to a person's behaviour" (Feist & Feist, 2008).

A trait in Cambridge English Dictionary is, "a particular characteristic that can produce a particular type of behaviour". There is a difference between our everyday understanding of traits and the scientific conception of traits. Different steps should be followed to conceptualize a trait scientifically. The first step is to measure and classify the trait by simply asking a person who has such a trait how s/he evaluates or rates himself or herself in terms of different trait adjectives (personality measured on the basis of an objective behavioural test). Or the evaluator can ask the person or some of his close relatives, for example, questions about behaviours which relate to

personality (the verbal report method). The second step is to test how traits are related to behaviours, as the table below does, to describe what a specific behaviour will reflect in terms of traits. For example, more time spent in conversation and less time spent alone both reflect extraversion.

Table 0-2: Examples of experimental studies showing correspondences between traits and objective behavioural measures

Study	Trait	behavioural measure
Carment, Miles and Cervin (1965)	Extraversion	More time spent talking
Edman, Schalling and Levander (1983)	Impulsivity	Faster reaction time
DeJulio and Duffy (1977)	Neuroticism	Greater distance from experimenter chosen
Ganzer (1968)	Test anxiety	More time spent looking away from the task during testing
Newman, Patterson and Kosson (1987)	Psychopathy	More persistence in gambling when consistently losing
Mehl, Gosling and Pennebaker (2006)	Extraversion	More time in conversation and less time alone
	Agreeableness	Fewer swear words used
	Conscientiousness	Less time spent at home and more time in class
Rhodes and Smith (2006)	Extraversion and Conscientiousness	More physical activity

Source: (Matthews, Deary, & Whiteman, 2009) p.5

The final step is to develop a satisfactory theory of personality traits. This is considered the most difficult step because we may assess and predict some aspects of behaviour, but the assessments will not tell us why a personality dimension predicts a specific sort of behaviour, especially when one personality may be shown at different levels of psychological description. An example of that is extraversion. Extraversion can be related simply to the central nervous system, such as the excitability of individual neurons. At the same time it can be a method of information processing or relate to a person's knowledge and beliefs (Matthews, Deary, & Whiteman, 2009).

Theory of personal traits: Big Five personality traits

A theory is a combination of different assumptions focused on one subject. These assumptions enable scientists to establish a testable hypothesis through the use of logical deductive reasoning (Feist & Feist, 2008).

In 1884, Sir Francis Galton developed a dictionary which presented an estimation of several personality-descriptive definitions in the lexicon. This estimation was later sharpened empirically by different scientists and several editions of the dictionary were developed. Galton's insight about the relationships between personality terms has been used by a number of investigators to discover the nature of these relations. L.L. Thurstone was among the first of them. He found sixty adjectives of personal description which were later analyzed using factor analysis and came up with five factors (Goldberg, 1993). Several investigators contributed to the development of the five personality traits, including Fiske (1949), Tupes and Christal (1961), Norman (1963), Borgatta (1964), and Digman and Takemoto-Chock (1981). The big five personality traits are:

Extraversion or Surgency (talkative, assertive, energetic)

Agreeableness (good-natured, cooperative, trustful)

Conscientiousness (orderly, responsible, dependable)

Emotional Stability versus Neuroticism (calm, not neurotic, not easily upset)

Cultured (intellectual, polished, independent-minded)

The title was selected not to show the greatness of the factors but rather to focus on the breadths of each of the factors (John & Srivastava, 1999). This model, which is also called five factor model, has met with more agreement than any other in personality trait psychology (Matthews, Deary, & Whiteman, 2009).

Personal traits: the behavioural approach to safety culture

A culture is a complex construct in an organization; it contains a variety of attitudes, perceptions, values and beliefs (Harvey, et al., 2002). An industrial safety culture is an environment where all the members feel that they are responsible for safety and meet safety objectives daily (Geller, 1994).

When this state of affairs is achieved, a worker will routinely care about safety. In 2002 Geller (Geller, The participation factor: How to increase involvement in occupational safety, 2002) has described three types of organizational culture. The first one is the dependent culture which exhibits conditions of licensure, choosing safety options merely to avoid a penalty, an environmental focus, fault finding and the importance of safety. The second type is the independent culture which is personal commitment, safety for oneself, focusing on behaviour, fact finding and safety as the priority. The last type is interdependent, which focuses on empowerment, team and community commitment, safety for oneself and others, environmental and behaviour, systems thinking, and safety as a value.

In 2001, Geller has proposed seven main principles of behaviour-based safety (BBS) that later developed into a people-based safety (PBS) approach:

- 1- Begin with observable behaviour
- 2- Look for external factors to understand and improve behaviour
- 3- Direct with activator and motivate consequences
- 4- Focus on positive consequences to motivate behaviour
- 5- Apply the scientific method to assess and improve interventions
- 6- Use theory to integrate information
- 7- Consider the feelings and attitudes of others

At the same time, when people are most likely to perform safety desired behaviours, they can act as safety agents who influence the safety of others. A study published in 1994 found a positive relationship between the number intervention agents involved in safety-belt promotions and the impact of the intervention. This led to developing an actively caring model which involved PBS perspectives (Dula & Geller, 2007).

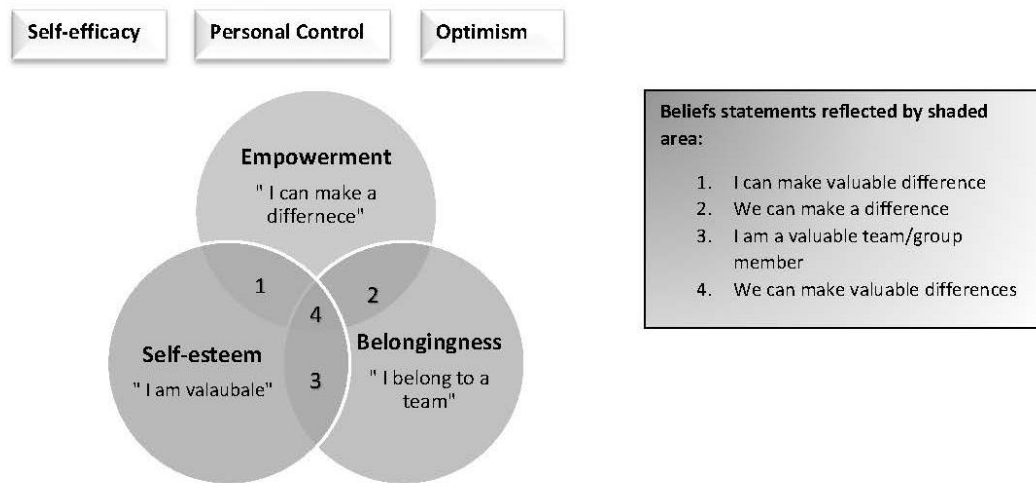


Figure 0-2: Actively Caring Model. Adapted from Geller (2002)

The above figure suggests a model that supports the building of a behaviour-based safety (BBS) culture. Workers who build this can encourage others toward a culture of greater social interdependency. Many writers have focused on the importance of getting the right culture for the organization and considered it as a main factor in its success (Harvey, et al., 2002).

Self-efficacy

Self-efficacy is the belief that we have in our own abilities, specifically our ability to meet the challenges ahead of us and complete a task successfully (Ackerman, 2008). Writers on self-efficacy have shown a positive relationship between self-efficacy and performance. It shows that self-efficacy can predict future performance better than past performance (Hysong & Quitnones, 1997).

Outcome expectancy/self-awareness

Self-awareness theory was originally developed in 1972 by Duval and Wicklund. Objective self-awareness (OSA) focuses on the self-reflexive quality of the consciousness. When people can apprehend the existence of environmental stimuli, they start to be aware of their own existence (Silvia, 2001). It suggests that one's attention at a specific time can be directed either toward oneself (the state of objective self-awareness) or away from oneself (the state of subjective self-

awareness). These two states are mutually exclusive. People can oscillate between them at short intervals (Duval, 1972). The original theory introduced focusing on the relationship and comparing oneself against standards, in which “the self reflects personal knowledge of itself while standard describes mental representations of correct behaviour, attitudes, and traits ... All of the standards of correctness taken together define what a 'correct' person is” (Silvia, 2001).

Actively caring behaviours

Actively caring describes people who care about others' safety and health and act accordingly. Those are usually people who are high in self-esteem, optimism and group belongingness. Some workers who have adopted work safely behaviours can be useful as intervention agents who can influence the behaviour of others (Roberts & Geller, 1995).

Attitude

There are many theories that link attitudes and safety behaviour. In 1991, Cox suggested that 'constructive' attitudes are among the most critical indices of the effectiveness of a safety culture (Cox & Cox, 1991). A better personal attitude means a better perception of the work atmosphere that leads to better safety performance. Studies have shown several factors that may account for 80% of the successful implementations of safety programs in construction companies and personal attitude is one of these critical factors (Al Haadir & Panuwatwanich, 2011).

Relationship between personal traits and performance

Performance research has shown that a person's competence in a specific task can be measured using trait measures. For example, some airlines use special tests such as MMPI to avoid hiring pilots with abnormally high sensation-seeking or psychopathic tendencies, or those with mental illness. In reality, many traits are related to risk-taking and impulsivity, such as sensation seeking and aggressiveness (Matthews, Deary, & Whiteman, 2009).

According to (Echchakoui, 2013), the personality traits of an employee can be analyzed in terms of their consistency in the affected behaviour, and their modes of cognition. The model of the big five traits of personality that were introduced by (Costa & McCrae, 1989) developed into a highly effective and popular tool for finding relationships between personality and individual behaviours. This model has been used by many researchers in their research studies. The five factors are agreeableness, conscientiousness, emotional stability, extraversion, and openness to experience.

Conscientiousness shows the capacity of an individual to strive for achievement, responsible, dependable, organized, efficient, persevering, and hardworking. Agreeableness means the tendency to be helpful, sympathetic, tolerant, friendly, good-natured, trusting, cooperative, and courteous. The extraversion means to be reward seeking, ambitious, sociable, gregarious, assertive, and adventurous. The meaning of emotional stability is being able to remain resilient, calm, tolerant of stress, even-tempered, self-confident, and well-adjusted. Finally, openness means being broad-minded, perceptive, imaginative, creative, intelligent, cultured, and curious.

(Dhani & Sharma, 2017) state that the impact of personal traits on job performance is obvious, and most companies make use of this impact for hiring workers. The above researchers find personality to be among the most important topics discussed by job advisors because selecting the appropriate workforce for particular job duties enhances the performance of employees and the organization. The differences that individuals have in their personality traits should match the differences in their job duties. Therefore, managers put much effort into choosing the right people for every job. These researchers further explained that the cognitive ability of an individual has been found to be an important and valid indicator of performance. Many researchers have found that personality traits are also have a close relationship with performance.

In 2005, a study by Clarke and Robertson used meta-analysis to demonstrate that there is a relationship between accident risk, low conscientiousness and low agreeableness. This study focused mainly on investigating the relationship between accident involvement and the big five personality dimensions (extraversion, neuroticism, conscientiousness, agreeableness, and openness) (Clarke & Roberston, 2005). The big five model overlaps to a certain extent the Actively Caring Model. This is because both of them are meant to measure the traits of an individual. In this research the Actively Caring Model was adopted, because the constructs of the Actively Caring Model are aligned better with OSH.

Summary

The idea of performance has different meanings and components. So, one can distinguish behavioural engagement from the results that were expected. An individual's performance means the actions that an individual takes to complete a job, and an outcome means the result of and the job behaviour of an individual. Therefore, behavioural engagement at job is related to the expected results. However, the result is also affected by several other factors, such as cognitive ability and

motivation. An individual's performance as a task performance consists of job related behaviour that includes the job responsibilities assigned with the job. People need cognitive ability to complete a task; and are supported by skills, knowledge, and habits. Therefore, the main factors of task performance are the ability to do the job and the worker's previous work experience.

To sum up, it is found that performance is a very important factor in the success of a company, a factor which should be monitored frequently and improved. Performance is a set of desired actions taken by any individual or employee. In order to improve and maintain the performance of employees within an organization appraisal is very important because it reveals workers' performance, on the basis of which they should be compensated. Campbell's model and various theories related to performance provide various perspectives on performance and ways of improving it? Why is it necessary? What factors have to be considered? How can firms improve performance? How to get the work done quickly by stimulating employees' best performance? It was also found that various factors are the key performance indicators of performance management. The company is required to work on the basis of these KPIs, which mainly consist of affective commitment, employee absenteeism employees' job performance.

Some researchers have found improvements in employee performance after multicourse appraisals. For example, Brett & Atwater, (2001), Smither et al. (2005), and DeNisi & Pritchard (2000) stated that the purpose of a multisource appraisal is to nurture employees and enable them to achieve job goals that will qualify them for promotion. Thus, the use of multicourse appraisal results in employees' performance improvement. They found that multicourse feedback has very little effect on performance. A very difficult issue in performance appraisal is the delivery of negative feedback to employees, who find it difficult to accept. Therefore, employees may fail to cooperate; and their performance may be affected negatively. However, reactions to negative feedback vary among employees, depending on their differences in regulatory focus, self-esteem, performance history, and goal orientation. Thus, managers should take these factors into consideration when providing negative feedback to employees. The researchers stated that appraisal data should not be used for any other purpose than development. However, if managers need to use this data for another purpose, they should inform employees because a performance appraisal system cannot be successful without trust between managers and employees.

Moreover, the management should be committed to employees in all conditions and should devise some policies in order to control employee absenteeism because it creates a loss for the firm and hinders it from achieving its goals and objectives. Further, employee job satisfaction is very pertinent because the employees are the key assets of an organization and on them the entire organizational success is based. Therefore, a company should satisfy them by providing various incentives. There is also a close relationship between OSH and workers' performance because if the employees are given a better working environment and culture, then they will perform well. Therefore, organizational safety and health practices should be a key focus for construction companies.

Finally, personal traits were covered, with a focus on one of the main personal traits theories the big five personality traits, namely, extraversion, agreeableness, conscientiousness, emotional stability, and openness.

CHAPTER FOUR: THEORETICAL RESEARCH FRAMEWORK

Introduction

This chapter covers the theoretical framework of the research and the relationship between its dependent and independent variables. In particular it discusses the framework for the relationship between research variables, the OSHAD SF and performance, effective commitment, absenteeism, and work alienation. The last section of the chapter discusses the proposed theoretical framework of the whole study.

The research conceptual framework

The main objective here is to investigate the relationship with and the impact of OSHAD SF on the performance of workers in the construction industry. In the literature many criteria have been assembled to evaluate the performance of workers, but this research will focus especially on three: affective commitment, absenteeism, and work alienation.

The main research question is: “What is the impact of Implementing OSHAD SF on Workers Performance in the Construction Industry in Abu Dhabi”.

To answer the above question, four hypotheses are investigated:

- H1: There is an association between OSHAD SF and employees’ affective commitment.
- H2: There is an association between OSHAD SF and absenteeism.
- H3: There is an association between OSHAD SF and work alienation.
- H4: There is an association between OSHAD SF and job performance.

Based on the above, the suggested conceptual framework is displayed in the figure below.

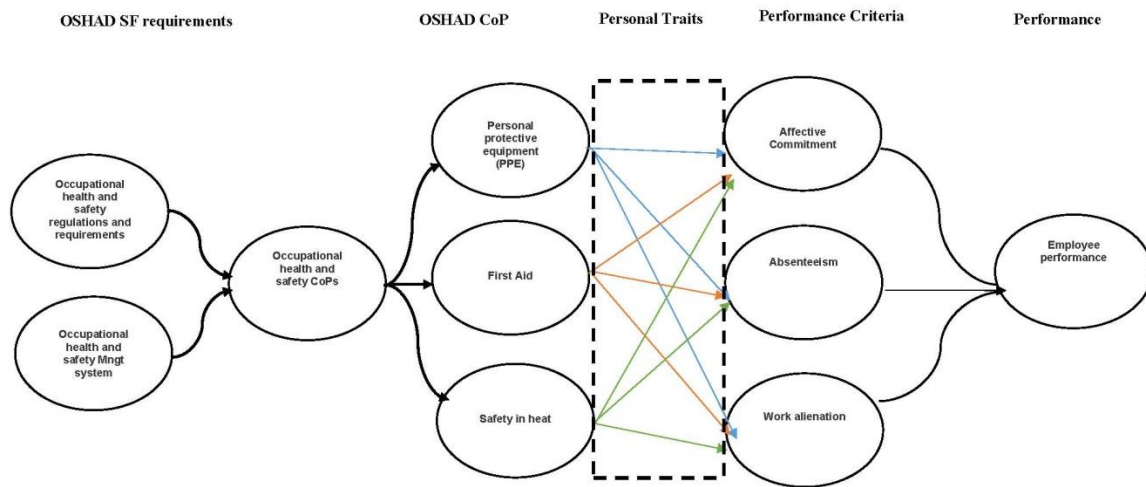


Figure 0-1: Research Conceptual Framework

According to Figure 4.2, below, the OSHAD SF requirements have two important aspects: the occupational health and safety regulations and requirements and the occupational health and safety system. These two have evolved as part of the occupational health and safety CoPs. Each CoP provides minimum OSH requirements on a particular subject, such as personal protective equipment. Managers must ensure that they are aware of the codes of practice, which are mandatory for all entities. The elements of the OSHAD CoP involved in this research concern personal protective equipment (PPE), first aid, and safety in the heat. Individuals perceive these OSHAD CoPs differently, because of personal traits and this results in three main types of performance criteria: affective commitment, absenteeism, and work alienation. This all impacts on job performance overall.

Performance in the literature

Performance management is commonly categorized as a human resources and organizational dimensions. However, performance management focuses not only on employees, but also on programs, processes, systems, and organizations as a whole. The management of organizational performance is seen from a wide institutional perspective as far as inputs, outputs, processes, and outcomes are concerned. This refers to any systematic and integrated approach to improve organizational performance that promotes the vision and values of an organization, and attains strategic goals (Waldt, 2012).

Researchers state that performance management gains momentum as the management increases its applications. The question arises of when these applications should be used as complements. Performance management can be categorized as the control of human resources and organizational dimensions. It focuses on individual employees, as well as programs, processes, systems, and organizations as a whole. The broad institutional perspective of organizational performance includes resources, processes, such as procedures, systems, outputs, and outcomes. Thus performance is a multi-dimensional concept about work and the results achieved (Waldt, 2012).

Occupational health is about an organization's work environment. The productivity of an organization is closely related to the safety and health of its workers. Organizations measure health and safety with the help of negative outcomes that include injury to employees or their illness at the work-place. However, these safety measures do not provide information about the actual measures that an organization has taken for the safety and health of its employees. A number of organizations pay more attention to negative outcomes at the work-place. However, organizations need to pay more attention to safety before an accident occurs. The organization should not list particular causes of accidents, but the number of elements that can cause an accident. Thus, it is not true that accidents occur only in unsafe situations; they occur when employees are exposed to them. So, poor work attitudes, low levels of employee training, and unsafe work practices result in increased numbers of accidents at work. Unsafe equipment and materials also cause them (Muchemedzi & Charamba, 2006).

The relationship of OSH and employee performance is particularly obvious in construction companies. This is because the performance of employees is completely dependent on employees' health. Hence health workers can contribute much to the organization. But no employees will perform well if they are not given proper care in work-place. Construction industry has many hazards for workers. Therefore, there is a need to particularly pay attention to occupational safety. The effective implementation of OSH systems, including regulations for health and safety, can make workers safer in their work-place and help them avoid accidents, leading to increased productivity for the organization and so will the feeling among employees that they have safe work condition, since satisfied employees perform better (Veltri, Pagell, Behm, & Das, 2007). Hence, a hypothetical association between OHS and workers performance, which is demonstrated in the following section.

Occupational health and safety management systems influencing performance

Healthy workers are those who are free of illness, injury, and any mental and emotional problems that may have a negative impact on their regular daily work activities (Dwomoh, Owusu, & Addo, 2013).

Researchers argue that manufacturing activities involve the use of machines; which always carry the risk of injury or accident to those who use them. Not only machines, but the overall environment of the work-place needs to be checked to avoid risky situations. If these issues are not addressed properly and with care, employees may suffer an accident in the course of their duties. Therefore, there is an increased pressure on a company to maintain safety and health standards and include them in the organizational strategy (Yusuf, Eliyana, & Sari, 2012). The present study collected data from a survey questionnaire and used the variables of occupational safety and health, employee performance, and job satisfaction of employees. The results of the research indicate that OSH significantly affects job satisfaction, so as the OSH level increases, job satisfaction among employees also increases. Moreover, job satisfaction significantly affects the performance of employees; and occupational safety and health management also significantly affects employee performance. The conceptual framework of the OSH management system and employee performance may be depicted as follows:



Figure 0-2: Conceptual Framework summarize OSH influencing performance

The above conceptual framework which been presented by (Yusuf, Eliyana, & Sari, 2012) shows the following association:

1. occupational safety and health management have a significant effect on employee performance
2. occupational safety and health have a significant effect on the performance of employees in a production department, and
3. job satisfaction significantly affects employee performance in a production department

Job satisfaction has a relationship with socio-demographic variables, facets of individuals' jobs, and job performance. In fact, a number of factors can affect employee performance, such as those that encourage satisfaction among employees. Some of the factors are challenging work, well-balanced compensation, supportive work condition, and supportive co-workers. When these aspects are met, an organization can expect increased performance from its employees (Crossman & Abou-Zaki, 2003).

Researchers have stated that recent work-place accidents have prompted organizations to think about OSH management practices. Moreover, the pressure by social and business communities, as well as public bodies has played an important part in making organizations realize the importance of OSH management systems. The present research used five dimensions of occupational safety and health, namely, the health and safety rules, risk management and safety procedures, training for first aid, support for organizational safety, and the prevention of occupational accidents. Data were collected from private sector companies and analyzed, using the least squares method. The findings of the research suggest that occupational safety and health practices, such as risk management, health and safety rules, safety procedures and risk management have positive effects on employee performance. The health and safety rules and safety support from organization were found to increase employee alienation. Moreover, risk management, safety procedures, safety support from organization and risk management were found to indirectly affect employee job performance (Kayank, Toklu, & Toklu, 2016).

A research study has stated that organizations have a moral and legal responsibility to provide employees with a safe work environment and ensure their complete wellbeing. The implementation of an occupational safety and health system is different in different organizations and locations. Organizations rely on their workers as work partners and fellow members. By alleviating the severity and rates of accidents in the work-place, violence, stress, illness, and risks, organizations can enhance their productivity and effectiveness. The research used the descriptive

research method and collected data from a survey. The findings of the research showed that occupational safety and health systems have a positive relationship with the performance of employees. The results also indicate that OSH programs have a positive relationship with employee performance. So, there is need for organizations to align their OSH programs to their organizational strategy (Olouch, 2015).

Safety management brings in any specific issues related to safety, such as practices, responsibility and performance (Abdullah, Spickett, Rumchev, & Dhaliwal, 2009). The use of such systems in every government institution can provide employees with clear and direct instructions, an accepted code, systems of rules and responsibilities plus the required procedures for the safe operation of machinery, and the devices and required behaviour of the various activities at work. Following these procedures and requirements will enable workers to work more effectively and efficiently, thus performing better (Dwomoh, Owusu, & Addo, 2013).

Writers have listed the various advantages of implementing occupational health and safety rules within the organization; for the purpose of the present research, the focus will be on the impact of occupational health and safety management systems on performance.

Studies done by Safe Work Victoria in 2006 shows that workers whose organizations observe health and safety procedures and policies feel valued. They believe that these organizations care about their health and want to protect them from danger.

The IOSH report published in 2008 support the previous studies and indicates that occupational health and safety policies have a positive impact on workers' outcomes in terms of job motivation, job involvement, and job performance. It also increases job commitment among employees. It supports the ability of employees to work very well and help the organization to reach its goals and objectives (Ward, 2008).

According to social exchange theory, workers show commitment and perform to the level of the benefit they have received from the organization. The perceived organizational support reflects workers' perceptions of the depth of the organization's appreciation of their hard work and care for their well-being and health. This perception shows in the workers' performance and can increase their efforts in favor of the organization.

Based the theoretical background presented in Chapters Two and Three and the above analysis, this research will test four hypotheses about the impact of adopting occupational health and safety management systems on workers' performance, in terms of commitment, absenteeism, work alienation, and job performance. These choices are justified in the following sections.

Developing the research hypotheses

Schein (2010) contends that organizational culture has a major impact on the integration of workers in the organization. This has been elaborated in a phenomenon called person-organization (PO) fit, which holds that when workers' values fit with the organization's values, it has a positive impact on workers' desire to work in the organization, stay there, and contribute to reaching the organization objectives (Chatman, 1989), (Kristof-Brown, Zimmerman, & Johnson, 2005).

In a research study, (Li, 2015) shows that there are three levels of organizational behaviour: first, individual behaviour, second, group behaviour, and third, organizational behaviour. Individual behaviour has the factors of ability, biographical characteristics, attitudes, values, emotions, personality, decision making, perception, motivation, and learning. Group behaviour has the factors of leadership, communication, group structure, trust, politics, conflict, and power. Finally, the organizational system involves factors of human resource policies, organizational culture, organizational design and structure. However, it is found that not all behaviours are affected by the culture of the organization, despite the close correlation between employee behaviour and organizational culture.

From the above evidence, it seems that when organizations consider occupational health and safety as a main element in their value and consider enforcing health and safety procedure on their employees, this will have an impact on workers' values and will encourage them to improve their performance and work together better to attain the organization's goals.

Below the three performance indicators that will be measured in this research are described in more detail. For each indicator, a hypothesis will be developed to test the impact of an OSH management system on it.

OSH management systems and affective commitment

Meyer and Allen's model of organizational commitment considers the dominance model to understand work-place commitment (Meyer & Allen, 1997). The model has three components –

affective commitment, normative commitment and continuance commitment. For the purpose of this research, commitment will be defined as a combination of these three components. This model has been used by researchers to evaluate the relationship and the outcome of commitment on different areas such as turnover, behaviour, performance, and other things (Jaros, 2007).

In 1997, researchers produced scales for the three commitment components, as follows:

Affective Commitment Scale (ACS)

1. I would be very happy to spend the rest of my career with this organization.
2. I enjoy discussing my organization with people outside it.
3. I really feel as if this organization's problems are my own.
4. I think that I could easily become as attached to another organization as I am to this one.
5. I do not feel like 'part of the family' at my organization.
6. I do not feel 'emotionally attached' to this organization.
7. This organization has a great deal of personal meaning for me.
8. I do not feel a 'strong' sense of belonging to my organization.

Continuance Commitment Scale Items (CCS)

1. I am not afraid of what might happen if I quit my job without having another one lined up.
2. It would be very hard for me to leave my organization right now, even if I wanted to.
3. Too much in my life would be disrupted if I decided to leave my organization now.
4. It would not be too costly for me to leave my organization now.
5. Right now, staying with my organization is a matter of necessity as much as desire.
6. I feel that I have too few options to consider leaving this organization.
7. One of the few serious consequences of leaving this organization would be the scarcity of available alternatives.
8. One of the major reasons that I continue to work for this organization is that leaving would require considerable personal sacrifice—another organization might not match the overall benefits I have here.

Normative Commitment Scale (NCS):

1. I think that people these days move from company to company too often.

2. I do not believe that a person must always be loyal to his or her organization.
3. Jumping from organization to organization does not seem at all unethical to me.
4. One of the major reasons that I continue to work in this organization is that I believe loyalty is important and therefore feel a sense of moral obligation to remain.
5. If I got another offer for a better job elsewhere, I would not feel that it was right to leave this organization.
6. I was taught to believe in the value of remaining loyal to one organization.
7. Things were better in the days when people stayed in one organization for most of their careers.
8. I do not think that to be a 'company man' or 'company woman' is sensible any more.

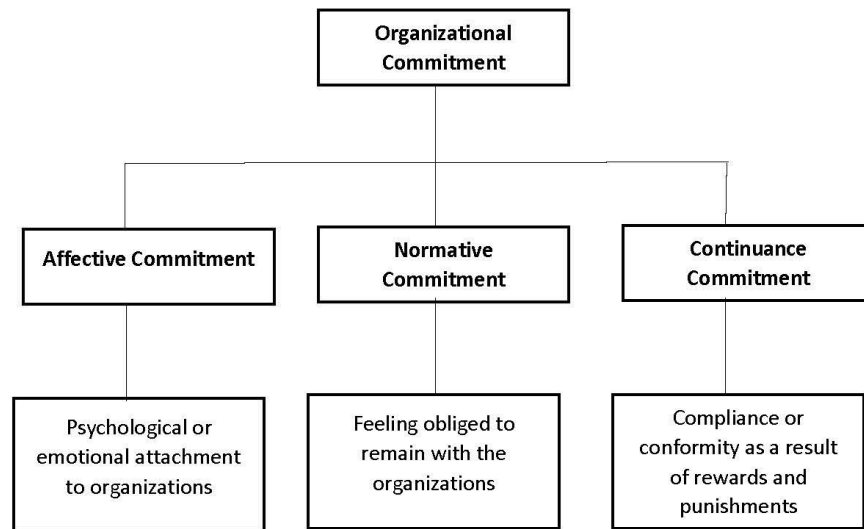


Figure 0-3: Meyer and Allen's three-component model of organizational commitment

Employee commitment is an important area for managers, researchers, and institutions. Many studies have been conducted to evaluate the relationship between organizational commitment and certain variables. Commitment reflects the tendency of employees to continue working in an organization. It also presents the relationship between the workers and the organization and the willingness of workers to participate in the organization. An employer's emphasis on safety has a positive relationship with the workers' organizational commitment and job performance (Kayank, Toklu, & Toklu, 2016).

There is a close relationship between occupational safety and the health and organizational commitment of employees. Organizational commitment and occupational health and safety have different dimensions and there is a positive association between continued employee commitment and occupational health and safety. Thus, the perception of employees about the health and safety management in an organization affects their decision to continue working in this organization, and contribute to it by improved performance. When employees judge the health and safety management in organization to be adequate, they want to continue their relationship with the organization. But when employees see less attention from the organization to their health and safety, they develop withdrawal behaviour including absenteeism (Amponsah-Tawiah & Mensah, 2016).

There is a close correlation between effective strategies for OSH management and improved employee commitment and performance. An effective OSH management can enhance employees' morale and give them confidence in the organization. As the employees are particularly affected due to their involvement in hazardous activities, management can improve the behaviours and trust of employees by providing them with a safe work environment. The OSH initiatives by management that allow employees to be involved in the development of the system allow employees to contribute their ideas on important organizational affairs. This results in an increased sense of commitment and belonging among employees. Studies that supported this finding include (Akpan, 2011). Thus, the following hypotheses can be posited:

I. Hypothesis 1: 'There is an association between OSHAD SF and affective commitment.

- a. Dependent variable: affective commitment
- b. Independent variable: OSHAD SF
- c. Group: construction sector in Abu Dhabi

Sub-hypotheses are:

H1.A: 'There is an association between OSHAD SF on PPE and affective commitment.

H1.B: 'There is an association between OSHAD SF on first aid and affective commitment.

H1.C: 'There is an association between OSHAD SF on safety in the heat and affective commitment.

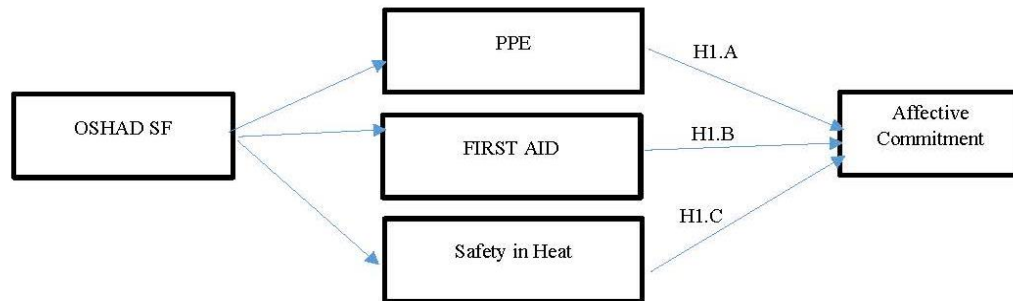


Figure 0-4: OSHAD SF/ Affective commitment

OSH management systems and Absenteeism

Workers' absenteeism is a costly problem that affects both employers and researchers. Literature indicates that a safe working environment secured by an effective occupational health and safety management system may reduce employees' absenteeism and lead to increased productivity and profitability for the organization (Dwomoh, Owusu, & Addo, 2013).

Employers have the right to expect a satisfactory level of attendance from their employees and many researchers have shown that absenteeism is a complex variable and can be affected by many factors, divisible into personal and organizational factors. Although there may be many reasons behind absence, the motivation to attend work is important for determining whether or not someone stays at home (Obasan, 2011).

A cost benefit analysis reveals that employees may have various incentives: compensation, medical, etc. Health promotion initiatives also have a significant effect on employees' behaviours. Incentives provide several benefits, such as reducing the costs of health care compensation, a rise in worker morale, increased productivity, and the reduction of disability, turnover, and absenteeism. Moreover, the development of participatory and consultative strategies, work group cohesion, and treating employees as important are highly effective work-place practices. Leadership practices that result in the increased participation of employees in problem solving and openness to opinion may reduce role conflicts, lessen ambiguity and stress, and increase satisfaction so as to reduce absenteeism (Australian Faculty of Occupational Medicine , 1999).

In most companies, absenteeism is managed by legal regulations. However, during the past few years, the approach of companies has changed significantly, as companies come to care more about work satisfaction, conditions, and commitment. They focus more on managing absenteeism by reducing whatever causes sickness and thus improve organizational performance. Some suggestions for reducing the absenteeism caused by sickness in an organization are listed below:

- The system of reducing the health problems related to work should be considered in developing the organizational strategy
- The important factors of a management system of sickness absenteeism, such as diagnosis, policy, measurement, action and evaluation should be included in these systems
- Modern management techniques should be applied for improved management and better working conditions,
- Management should conduct in-depth analyses of the causes, and evaluate the short term and long term effects, of sickness absenteeism
- Establishment and improvement of organizational management of health and safety
- Increased use of disciplinary techniques in the work-place
- Development of humanizing and structuring processes and actions in order to prevent discomfort in the work-place
- Evaluation of the current work practices of employees, and programs aimed to promote health and well-being among employees
- Adoption approaches to examine absenteeism and working conditions. Sickness absenteeism generates changes in the behaviour of managers, employees, and external parties. Change can result in increased competitiveness for the organization (Koziol, Szkola, & Koziol, 2016).

Absenteeism is an undesired event for an organization, disrupting its activities. When a worker is scheduled to come to work but does not do so, many researchers trace it to withdrawal behaviour from the work environment. In this paper, an ILO survey will be used as the reference to evaluate the absenteeism level. This survey was developed by researchers to abstract the absenteeism and presentism question from the Health and Work Performance Questionnaire (HPQ) (Kessler, Petukhova, & McInne, 2003) .

The absenteeism questions in the survey were as follows:

B3. About how many hours altogether did you work in the past 7 days?

B4. How many hours does your employer expect you to work in a typical 7-day week?

B5. Now please think of your work experiences over the past 4 weeks (28 days). In the spaces provided below, write the number of days you spent in each of the following work situations.

In the past 4 weeks (28 days), how many days did you:

- B5a. ...Miss an entire work day because of problems with your physical or mental health?
(Please include only days missed for your own health, not someone else's health.)
- B5b...Miss an entire work day for any other reason (including vacation)?
- B5c. Miss part of a work day because of problems with your physical or mental health?
(Please include only days missed for your own health, not someone else's health.)
- B5d...Miss part of a work day for any other reason (including vacation)?
- B5e. ...come in early, go home late, or work on your day off?

B6. About how many hours altogether did you work in the past 4 weeks (28 days)?

B9. On a scale from 0 to 10 where 0 is the worst job performance anyone could have at your job and 10 is the performance of a top worker, how would you rate the usual performance of most workers in a job similar to yours?

B10. Using the same 0-to-10 scale, how would you rate your usual job performance over the past year or two?

B11. Using the same 0-to-10 scale, how would you rate your overall job performance on the days you worked during the past 4 weeks (28 days)?

Scoring absenteeism

Researchers have two ways of measuring and scoring absenteeism. One relies on the respondent's estimate of the number of hours he/she worked over a four-week period. The other asks the respondent to estimate how many hours he/she worked in the past 7 days. Absenteeism is scored in terms of hours lost per month, which is to say that a high score indicates more absenteeism.

Occupational health and safety should help to reduce absenteeism since one of the objectives of the system is to identify health risks. OSH systems also have the potential to improve workers' psychological wellbeing or stress levels, and this positive development may, in turn, lead to a

significant drop in absenteeism rates (Hickman, 2014). There is a relationship between occupational safety and health (OSH) prevention and programs, processes and outcomes. It has an effective influence on company performance, and such programs should be aligned with the company's objectives and continued improvement to the point of excellence. OSH results in positive outcomes in the organization like lower costs, an improved company image, less staff turnover, higher productivity, and lower levels of absenteeism (Hesapro, 2013). These studies show that there is a negative relationship between OSH management systems and absenteeism. Therefore, the second set of hypotheses is posited as follows

II. Hypothesis 2: 'There is an association between OSHAD SF and absenteeism.

- a. dependent variable: absenteeism
- b. Independent variable: OSHAD SF
- c. Group: construction sector in Abu Dhabi

Sub-hypotheses are:

H2.A: 'There is an association between OSHAD SF (personal protective equipment PPE) and absenteeism.

H2.B: 'There is an association between OSHAD SF (first aid) and absenteeism.

H2.C: 'There is an association between OSHAD SF (safety in the heat) and absenteeism.

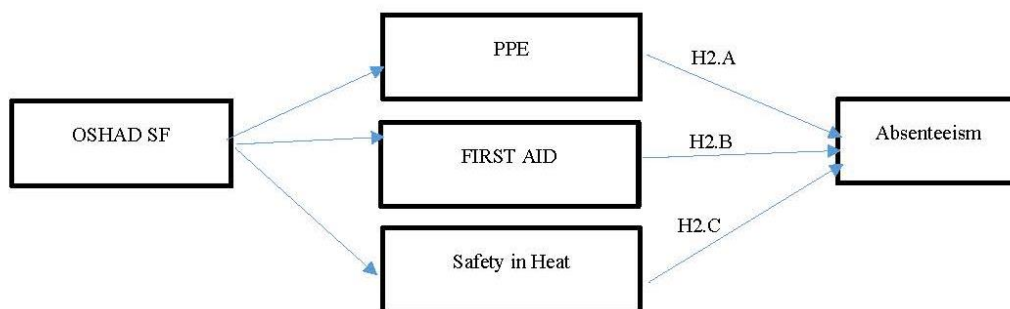


Figure 0-5: OSHAD SF/Absenteeism

OSH management systems and Work Alienation

The concept of alienation is covered widely in different areas such as theology, philosophy, sociology, psychology, and psychiatry (Johnson & Murchland, 1974). Thus, since 1995, alienation has been described and defined in differently by several researchers. The table below presents some definitions (Nair & Vohra, 2009).

Table 0-1: Definitions of Alienation Description/Definitions of Alienation

Fromm (1955)	Mode of experience in which a person experiences him- or herself as alien or estranged from him- or herself (p. 120)
Seeman (1959, 1975)	Described in terms of powerlessness, meaninglessness, normlessness, social isolation, and self-estrangement
Horowitz (1966)	Intense separation first from the objects of the world, second from people, and third from ideas about the world held by other people (p. 231)
Schacht (1970)	Dissociative state of the individual in relation to some other element in his or her environment
Miller (1967)	Objective state of isolation from others (p. 260)
Kanungo (1979)	Generalized cognitive (or belief) state of psychological separation from work insofar as work is perceived to lack the potentiality for satisfying one's salient needs and expectations (p. 131)
Hirschfeld & Field (2000)	Represents the extent to which a person is disengaged from the world of work (p. 790)

The term 'alienation' has different uses in different contexts and fields. In the context of HR management, it is important for managers to realize that alienation among employees is a kind of sickness that should be avoided. Work alienation is the psychological state of an employee that creates a sense of frustration due to ` failure to achieve objectives and goals. A number of factors can cause work alienation among employees. Age does not have a significant relationship with work alienation. Alienation is an objective reality, as Marx observed, and many find it an experience of meaninglessness, powerlessness, self-estrangement, and isolation. Alienation is a central construct of psychologists concerned with existential psychology. The feeling of alienation

in this case originates in separation from the real self. So, it is important to find whether modern management techniques, work structures, and the adoption of HR practices have worked to resolve the issue of employee alienation in the work-place. It has been found that some approaches by managers have failed to prevent the feeling of alienation. Moreover, HR management has introduced certain practices that have also failed to prevent alienation. A solution to these problems is to adopt a more productive approach that deals with alienation issues before employees are appointed to the organization. The recruitment process should emphasize creating a match between the job duties and the inner self of applicants, their personalities and their psychological makeup (Nelson & O'Donohue, 2006).

Here the term 'operationalization of alienation' arises, which refers to an index developed to measure this state by Seeman in 1967; it is one of the earliest indices. The one used in the present study is derived from an evaluation proposed by Hinkin in 1995 and from reviewing several other published sources. The measure of work alienation consist of eight main items, and was published in a journal article by Nair and Vohra (Nair & Vohra, 2009). The items are include:

- I do not enjoy my work
- Facing my daily tasks is a painful and boring experience
- Work to me is more like a chore or burden
- I feel estranged/disconnected from myself
- I often wish I were doing something else
- Over the years I have become disillusioned about my work
- I do not feel like putting in my best effort at work
- I do not feel connected to the events in my work-place

Consideration from leaders who show concern and support to the workers, respecting them and looking after their welfare, will be reflected in the form of lower work alienation. Studies show that there is a negative relationship between individual consideration and work alienation (Kayank, Toklu, & Toklu, 2016).

Alienated employees may have different reasons for their alienation, but some common causes have been observed. When a company reduces the number of its employees to lower costs, the employees feel alienated. In addition, the restructuring of an organization, more pressure from managers to enhance performance, technical changes, and downsizing result in worker alienation.

Another reason for feelings of alienation to develop is holding a part-time job. Employees who work part-time feel more alienated. Lack of training is another reason for alienation among employee (Tummers, 2013). Although employee alienation has many causes it always results in employee behaviour and performance with a negative effect and when employees are alienated from their work, their performance deteriorates in consequence. Another reason for alienation is the feeling of meaninglessness or powerlessness. Therefore, when employees feel that their work is meaningless, they reduce their efforts and the quality b of their work. Hence, the meaninglessness of one’s work has a negative effect on employee commitment (Hirschfeld & Field, 2000). Therefore, the following hypotheses may be posited.

III. Hypothesis 3: ‘There is an association between OSHAD SF and work alienation.

- a. independent variable: work alienation
- b. dependent variable: OSHAD SF
- c. Group: construction sector in Abu Dhabi

Sub-hypotheses are:

H3.A: ‘There is an association between OSHAD SF (PPE) and work alienation.

H3.B: ‘There is an association between OSHAD SF (first aid) and work alienation.

H3.C: ‘There is an association between OSHAD SF (safety in the heat) and work alienation.

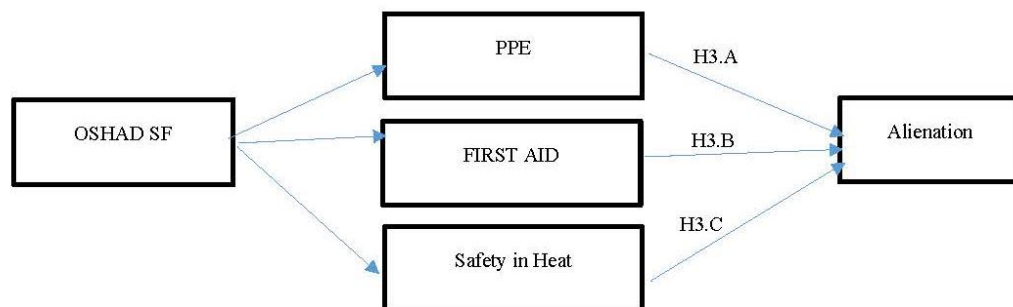


Figure 0-6: OSHAD SF/ Alienation

OSH management systems and Job Performance

Occupational safety and health is a highly important issue for workers, and the way the managers deal with it is an important academic and practical question. Work systems play an important role in ensuring management's implementation of OSH practices and employees' job satisfaction and performance. The job characteristics that are related to high performance job systems help workers to feel valued and significant in their work, with better use being made of their skills and knowledge, improved responsibilities at work and the resulting job safety and job satisfaction. Thus, a high performance system in an organization develops an improved work environment for workers that results in improved product quality. High performance systems produce highly valued results, such as commitment-oriented work systems, reduced turnover rates, and higher financial performance and productivity for the organization. At the worker level, there is evidence that higher OSH work systems can enhance workers' job performance, and reduce their fatigue. Findings show that higher performance systems have a direct effect on safety at the organizational level, and an indirect effect at the employee level (Barling, Kelloway, & Iverson, 2003).

OSH is the science of the recognition, evaluation, and control of hazards to the wellbeing of employees. OSH is applicable to the disciplines that are concerned with the health, safety and wellbeing of working people. Occupational safety and health has the purposes of maintaining and promoting the highest level of mental, physical, and social welfare of employees in all types of occupation; It prevents employees from leaving a firm because of health issues that arise from working conditions and ensuring that workers are placed in conditions that suit them best. This objective seeks job satisfaction for employees that will enhance their performance and that of the organization (Sembe & Ayuo, 2017).

The present researchers had the following goals: to find the effects of wellbeing management practices on employee job satisfaction, to determine the effects of emergency management initiatives by management on employee job satisfaction, to discover the effect of environmental practices in the work-place on job satisfaction, and to find the effect of welfare management activities, work-place management activities, and emergency management practices on job satisfaction. The research findings show that OSH practices result in improved job satisfaction. It was recommended to invest in the OSH issues that employees are concerned about.

In this research, the following job performance scale is used (Kayank, Toklu, & Toklu, 2016)

- I always complete the tasks involved in the job description in my work-place.
- I fulfill my responsibilities as required by my job.
- I am not successful in fulfilling my basic tasks.
- I do not neglect the tasks required by my job.
- I fulfill the formal tasks required by my job.

One of the main objectives of OSH is to build a safe and healthy work-place, and to protect workers from accidents and all other adverse events. Studies have shown that there is a positive relationship between OSH practices and implementation and job performance (Yusuf, Eliyana, & Sari, 2012).

Based on this analysis, the following hypotheses are formulated:

IV. Hypothesis 4: ‘There is an association between OSHAD SF and job performance.

a. Dependent variable: job performance

b. Independent variable: OSHAD SF

c. Group: construction sector in Abu Dhabi Sub-hypotheses are :

H4.A: ‘There is an association between OSHAD SF (personal protective equipment PPE) and job performance.

H4.B: ‘There is an association between OSHAD SF (first aid) and job performance.

H4.C: ‘There is an association between OSHAD SF (safety in the heat) and job performance.

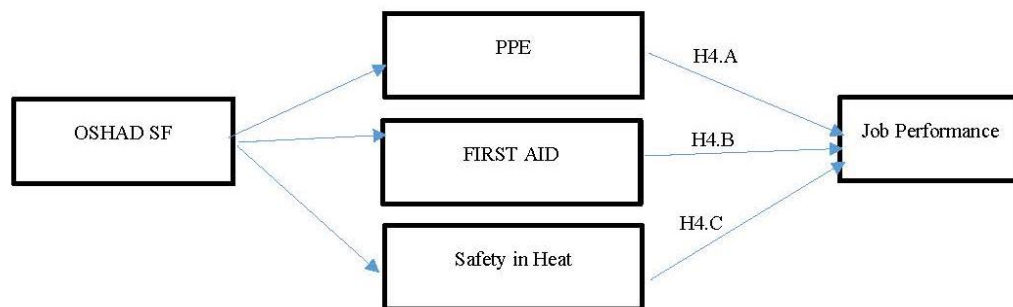


Figure 0-7: OSHAD SF/ Job performance

Summary

The research theoretical framework suggests a relationship between OSH management systems and the performance of workers. Additionally, writers have shown various relationships with different performance criteria. In this study, the criteria for measuring performance will be covered: commitment, absenteeism, work alienation.

The chapter includes the theoretical background of the factors that affect employee performance and can be improved under OSH management systems. The main research question is ‘What is the impact of implementing OSHAD SF in Workers Performance in the Construction Industry in Abu Dhabi? To answer the above question, four hypotheses were developed and will be tested:

- H1: There is an association between OSHAD SF and employees’ affective commitment.
- H2: There is an association between OSHAD SF and absenteeism.
- H3: There is an association between OSHAD SF and work alienation.
- H4: There is an association between OSHAD SF and job performance.

According to the framework developed with the help of these hypotheses, the OSHAD SF requirements have two key aspects: the regulations and requirements for occupational health and safety; and the occupational health and safety system. These aspects of OSHAD SF requirements have evolved as occupational health and safety CoPs.

Workers perceive these OSHAD CoPs differently, resulting in three types of performance criteria: commitment, absenteeism, work alienation. These factors in turn affect employee performance. Performance management is commonly categorized in human resource and organizational dimensions.

The framework of occupational safety and health management and its effect on employee performance has this relationship through employee satisfaction. Improved occupational safety and health management results in employee satisfaction, which enhances performance. In fact, a number of factors can affect employee performance, such as the factors that encourage performance among employees. Some of the factors are challenging work, well-balanced compensation, supportive work condition, and supportive co-workers. When these aspects are met, an organization can expect increased performance from its employees.

Employers' emphasis on safety has a positive relationship with organizational commitment and job performance. In addition, there is a negative relationship between OSH management systems and absenteeism. Studies show that there is a negative relationship between individual consideration and work alienation. Furthermore, it has been shown that there is a positive relationship between OSH practices and implementation and job satisfaction.

CHAPTER FIVE: RESEARCH METHODOLOGY

Introduction

This chapter describes explains how the research was carried out in order to meet the study's main objectives. The first section deals with the four research philosophies: positivism, realism, interpretivism, and pragmatism. The second section of the chapter covers deductive and inductive research approaches, before presenting in detail some research strategies; finally, the research design and process are described.

Research Design

The research design is the basis of any research work, or can be described as the backbone of the study. It presents the research components, and the way in which they are linked with each other during the whole research process. This study follows the research design described by Saunders (2016)

The right design among many is the one, which will enable the researchers to answer their initial questions. There are two sources of data: secondary data, using the literature review, and primary data, gathered in this case from a questionnaire survey. The secondary data are those which are already published as printed or electronic copy. The primary data are data collected by researchers to meet their study objectives (Saunders, Lewis, & Thornhill, 2015).

In their book, Hair, Money and others have classified research designs into three kinds depending on their objective (Hair, Money, Samoul, & Page, 2007):

The first kind is *Exploratory research*: it is used when the researchers have little information about the problem or opportunity. It depends mostly on qualitative techniques.

The second kind is *Descriptive research*: this research design focuses on data analysis. It describes the traits of the main topics of the study. The research questions are descriptive, and answer questions beginning 'who', 'what', 'where', 'when', and 'how' (Saunders, Lewis, & Thornhill, 2015). In this type of research, the data is collected through observation or structured interviews (Hair, Money, Samoul, & Page, 2007).

The third kind is *Causal research* which tests whether one event leads to another. Some researchers call this design explanatory research while others call it analytical research. It focuses on

explaining how a change in a variable X (a cause) brings a change in a related variable Y (effect) (Hair, Money, Samoul, & Page, 2007).

The research design is the invention and generation of ideas, images, performances, artefacts including design, which lead to new or substantially improved insights; and the use of existing knowledge in experimental development to produce new or substantially improved materials, and processes. It excludes “the development of teaching materials that do not embody original research” (hefce, 2008).

From the above definition, the main distinct characteristics of a research study are that academic research is an original investigation. It is conducted to gain knowledge, give new understanding, and improve insights and materials, devices and products. Research originates with a question or a problem (see Chapter One). It is guided by a unique and clear problem and hypotheses (see Chapters One and Four) to reach a specific goal and sub goals. It should follow a clear plan for proceeding. It depends on collecting, interpreting and analyzing data. Moreover, data must be collected systemically and interpreted systematically (see Chapters Six and Seven).

Research Philosophy (Paradigm)

Research philosophy is the first or outer layer of the research onion. A research philosophy is defined as "a system of beliefs and assumptions about the development of knowledge" (Saunders, Lewis, & Thornhill, 2015) . It reflects the source and the nature of the developed knowledge. Therefore, it must be the first topic to consider in research methodology.

The process of exploring the research philosophy has to start a reflexive process which has two functions: first, to ask questions about our research beliefs and assumptions, and, second, to be familiar with the major research philosophies in business and management (Saunders, Lewis, & Thornhill, 2015) .

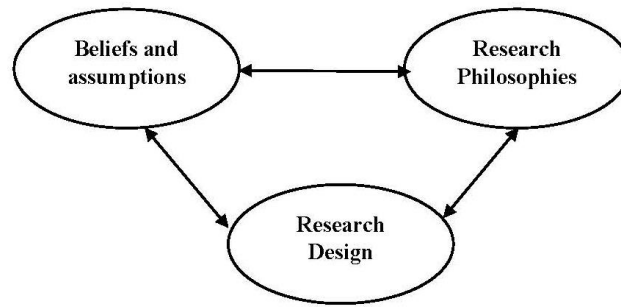


Figure 0-1: Developing Research Philosophy: A Reflexive Process

Researchers should consider the relationship between research philosophy and the data collection method and should present the implications of the chosen research philosophy and research strategy. Associated with each research philosophy are certain methods of data collection .

Table 0-1: Research philosophies and data collection methods

	Pragmatism	Positivism	Realism	Interpretivism
Popular data collection method(s)	Mixed or multiple method designs, quantitative and qualitative content	Highly structured, large samples, measurement, quantitative, but can use qualitative content	Methods chosen must fit the subject matter, quantitative or qualitative content	Small samples, in-depth investigations, qualitative content

Source: (Saunders, Lewis, & Thornhill, 2012)

There are four types of research philosophy: positivism, realism, interpretivism, and pragmatism, which are discussed in turn below.

Positivism

Positivism refers to knowledge gained through observation, including measurement. It is the knowledge that stems from human experience, and it considers the world as a set of separate elements and events that interact and can be observed and determined in a regular manner (Crowther & Lancaster, 2008). This study follows the positivist approach in measuring the association between the research constructs.

Realism

Realism as a research philosophy suggests the independence of phenomena from the human mind. It depends on a scientific approach to developing knowledge. It consists of two types: direct realism and critical realism. Direct realism suggests that what you see is what you get (Saunders, Lewis, & Thornhill, 2012). Critical realism suggests that people do experience sensation and see images, but that sometimes these sensation and images are deceptive and do not convey phenomena accurately (Novikov & Novikov, 2012).

Interpretivism

This is also called the interpretivist research philosophy. It depends on the interpretation of elements of the study, and it integrates human interest into the study. It suggests that access to what is called reality can be made through social constructs such as language, consciousness, shared meanings, and instruments (Myers, 2009).

Pragmatism

Pragmatism as a research philosophy accepts only the concepts which are supported by action. This philosophy recognizes that there are several ways to interpret the world, and no one single way of viewing the whole picture. It posits multiple realities (Saunders, Lewis, & Thornhill, 2012).

Logic of the Research (Deductive or Inductive Research)

After choosing the research philosophy, researchers should identify whether the research logic moves from the general to the specific or vice versa (Saunders, Lewis, & Thornhill, 2015). There are two schools of thought related to the deductive and inductive research approaches. These two approaches are derived from two alternative methods of thinking. The deductive research approach focuses on developing theories or hypotheses and then tests them by means of empirical observation. It is widely used in the natural sciences (Lancaster, 2009).

Previous research had suggested the process of the **deductive approach**. The first step is to formulate a theory and/or hypotheses. The second step is to translate abstract concepts into indicators or measures that enable observations to be made. Following this, researchers will test the theory through observing the empirical world. Finally, they choose one of two routes, either finding the theory untenable and discarding it creating as yet unfalsified covering laws that explain past, and predict future observations (Gill, 1997)

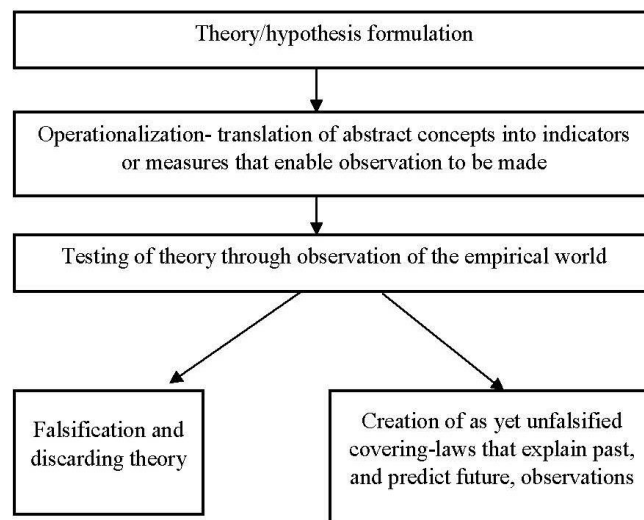


Figure 0-2: The Process of Deduction (Gill and Johnson, 1997 p.32)

Inductive research reverses the process followed in deductive research. In the inductive approach researchers develop hypotheses and theories which claim to explain empirical observations of the real world. Researchers may also consider their own experiences to support hypotheses or can use observed data and information and develop theories (Lancaster, 2009).

A major difference between the deductive and inductive approaches is that the former focus on testing theory, while the latter focus on generating new theory from the collected data. In general, inductive approaches are related to qualitative research and deductive approaches are associated with quantitative research.

In this research, deductive approaches were used. The aim of this research was to generate a new theory based on data that were collected using quantitative research methodology.

Methodological Choice and Research Approach (Quantitate and Qualitative Approaches)

Research strategy is the guidance or methodology that researchers choose to investigate the research questions and reach their study objectives. An effective research strategy should contain clear objectives and questions, data collection methods, methods of analyzing data, and ways of tackling the study constraints that affect the research. Examples of constraints include access limitations, time limitations, and also some ethical constraints.

The two types of research, basic and applied, can be compared in terms of goals, working norms, and reference groups (Demartini, 1989). See Table 5-2 below.

Table 0-2: Comparison of basic and applied sociology

	Discipline Oriented Basic Sociology	Client oriented Applied sociology
Goals	Knowledge production	Problem solving
Working norms	Careful testing of hypotheses and qualification of conclusion	Persuasive use of available information
Reference groups	Fellow professionals	Political interest groups

The objective of basic research is to extend knowledge in an area. It is mainly driven by intellectual interest in a phenomenon. In contrast, the objective of applied research is to improve the quality of practice of a specific discipline. The audience for applied social science is different from the basic research audience. Researchers in applied social science expect that their research will have an impact on administrators and policymakers, and it will change the way that things are handled (Merriam, 2009).

Research can cover a single point in time, and is then called cross-sectional. Other studies may cover events over a long period; these are called longitudinal studies.

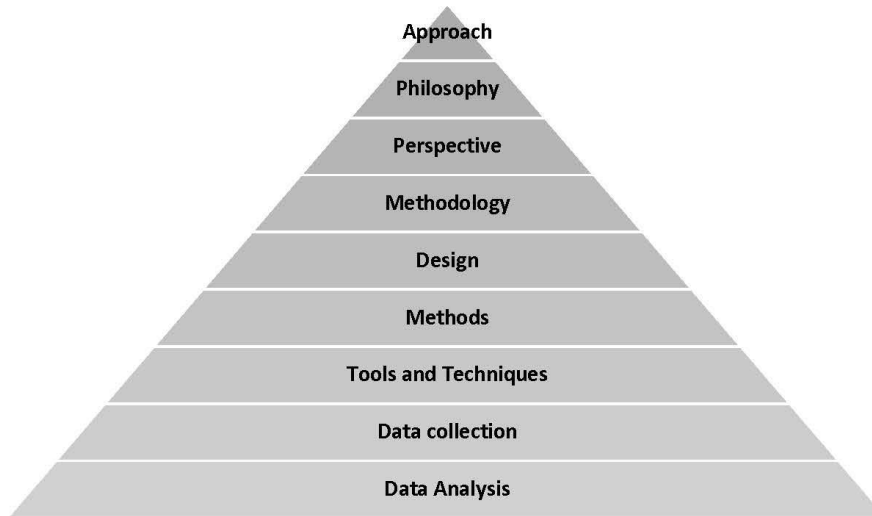


Figure 0-3: Research Methodology Hierarchy (Maylor and Blackmon, 2005 p.155)

Researchers use qualitative, quantitative or mixed research approaches. The table below describes the practices of the three different approaches.

Tend to or typically	Qualitative Approaches	Quantitative Approaches	Mixed Methods Approaches
<ul style="list-style-type: none"> • Use these philosophical assumptions • Employ these strategies of inquiry 	<ul style="list-style-type: none"> • Constructivist/transformative knowledge claims • Phenomenology, grounded theory, ethnography, case study, and narrative 	<ul style="list-style-type: none"> • Post positivist knowledge claims • Surveys and experiments 	<ul style="list-style-type: none"> • Pragmatic knowledge claims • Sequential, concurrent, and transformative
<ul style="list-style-type: none"> • Employ these methods 	<ul style="list-style-type: none"> • Open-ended questions, emerging approaches, text or image data 	<ul style="list-style-type: none"> • Closed-ended questions, predetermined approaches, numerical data 	<ul style="list-style-type: none"> • Both open- and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis

<ul style="list-style-type: none"> • Use these practices of research as the researcher 	<ul style="list-style-type: none"> • Positions him- or herself • Collects participant meanings • Focuses on a single concept or phenomenon • Brings personal values into the study • Studies the context or setting of participants • Validates the accuracy of findings • Makes interpretations of the data • Creates an agenda for changes or reform • Collaborates with the participants 	<ul style="list-style-type: none"> • Tests or verifies theories or explanations • Identifies the variables to be studied • Relates the variables in questions or hypotheses • Uses standards of validity and reliability • Observes and measures information numerically • Uses unbiased approaches • Employs statistical procedures 	<ul style="list-style-type: none"> • Collects both quantitative and qualitative data • Develops a rationale for mixing • Integrates the data at different stages of inquiry • Presents visual pictures of the procedures in the study • Employs the practices of both qualitative and quantitative research
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Table 0-3: Qualitative, Quantitative, and Mixed Methods Approaches

Source: (Creswell, 2014) Page: 18

Since this study uses hypotheses and a questionnaire to confirm its theoretical assumptions it can be inferred that the quantitative approach is used as an instrument for conducting it.

Quantitative research methods

Quantitative research involves collecting and analyzing quantitative data (i.e., numerical) to find statistical relationships between variables.

The following definition, taken from Aliaga and Gunderson (2002), describes quantitative research methods: Quantitative research involves ‘Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics).’ (Muijs, 2011).

From the above definition, it seems that the objective quantitative method is to explain phenomena. Researchers try to explain something and to answer a question through collecting numerical data. Some data exist normally in numerical form; however, other data that are not available naturally in a quantitative form can be collected in a numerical way. When a numerical phenomenon does not exist, a special quantitative research instrument is designed, as in the case of attitudes and beliefs. In such research, a special mathematically based method is used to analyze the data.

There are four basic types of question which are answered better by means of quantitative research. The first consists of questions to which researchers seek a quantitative answer. The second is questions asked when researchers want to follow numerical changes such as the numbers of workers are rising or falling in specific fields. The third type is questions asked when researchers want to know the state of something. The last type of question for which quantitative research gives the best answers is entailed in testing hypotheses. A hypothesis is an uncertain clarification that seems to accounts for a set of facts and can be tested by more investigation and examination (Muijs, 2011). This study adopts the fourth type of strategy for its research design and data collection.

Qualitative research methods

Qualitative research involves collecting and analyzing qualitative (i.e., non-numerical) data to identify patterns and themes. In general, qualitative researchers ask how meaning is constructed and how individuals make sense of their lives; however, basic qualitative research seeks to understand and interpret these meanings.

While quantitative research systematically describes the facts and characteristics of a specific phenomenon, qualitative research methods understand how people construe their experiences, how they create their worlds, and what meaning they attribute to their experiences (Merriam, 2009).

Many researchers have introduced research methods of different types. Merriam (Merriam, 2009) in her book covers seven approaches, namely:

Basic qualitative research is the most common type of qualitative research in applied fields such as education, administration, business, health, and others.

In qualitative research, researchers construct what is called reality in interaction with their social worlds. Constructionism reflects the basic qualitative research. It helps researchers to understand how individuals make sense of their daily life and their experiences through (1) the ways that individuals understand their experiences, (2) the ways that they construct their world, and (3) what meaning they attribute to their experiences.

In this type of research, data can be collected according to the discipline's theoretical framework by interviews, observations, or document analysis.

- Phenomenology

During twentieth, phenomenology was considered a school of philosophy associated with Husserl (1970) and also a type of qualitative research.

Phenomenologists focus on people's lives and experience more than on categorizing, simplifying, and reducing phenomena to abstract laws. This interest forces researchers to go directly to the things themselves and to study people's experiences and their lives.

All qualitative research focuses on experiences; however, this type of research assumes that experiences have an essence or essences.

Researchers in this type of research want to describe the essence of the basic structure of experience. To collect data, researchers mainly use interviews to explore the research themes that need to be investigated. Then the data from these interviews are used to generate further questions. This process is, however, deemed unsuitable for the present study because of the difficulty of access to construction sites.

- Grounded theory

Glaser and Strauss first introduced this method in 1967 in their book, *The Discovery of Grounded Theory*. In this type of research, researchers assume an inductive position and work to derive meaning from the data collected. The result of doing so is grounded theory. This research does not

focus on providing a rich description, although it is required; rather, the focus is on building a substantive theory.

In grounded theory the data are collected from interviews, observations, and a wide range of documentary materials. This study breaks down into two steps. First, data are collected by theoretical sampling. Then they are coded and analyzed and the researchers decide what data they will need next and where to look for it. The second step is analyzing the data by the constant comparative method, which is widely used in all kinds of qualitative research. The constant comparative analysis depends on comparing segments of data with one another. The objective of such comparison is to determine similarities and differences. Later, similar data are grouped together with a given name, forming a category. This gives the analysts a pattern, which is arranged according to its relationships and then a grounded theory can be built. Identifying a core category is critical to substantive theory. It is the basic and main conceptual element, which controls all the other categories and properties and connects them.

- Narrative analysis

Narratives or stories are considered examples of the oldest and most natural method of sense making. Narrative analysis reflects how people make sense of their experiences and how they use them to understand the world. It shows also how people communicate with others.

Stories or narratives are important sources of qualitative research and can be used as data. Narrative analysis can be applied to stories, narratives, biographies, life histories, oral history, auto-ethnography, and autobiography. It uses such methodological approaches to analyze stories, as biographical, psychological and linguistic ones. Biographical approaches focus on gender, race, and family of origin, life events and experiences. Psychological approaches focus on personal thoughts and motivation. Finally, linguistic approaches concentrate on the language of the story or the spoken text.

- Critical qualitative research

Critical qualitative research is different from the above qualitative methods. While basic, phenomenology, ethnography, grounded theory and narrative are interpretive methods that focus on understanding phenomena, the critical qualitative method focuses on critiquing and changing

society. Its critical method concentrates on context more than on people. It focuses on a broader view, for example, the systems, culture and organizations that shape different practices.

- Case study

The case study is considered one of the qualitative research methods; it enables researchers to go through reports of past studies, to explore further and to understand complex issues. This type of research method is used in a range of social science areas including education, sociology, and others (Zainal, 2007).

Combining quantitative and qualitative research methods

This type of research combines or mixes quantitative and qualitative research techniques in a single study.

Time Horizon

There are two types of time horizon study, one, which is cross-sectional (known as snapshot), involves the study of phenomena at a specific time. The other type is longitudinal (known as diary); it studies events or phenomena over time and is most used when research is concerned to know how things may change over time (Saunders, Lewis, & Thornhill, 2015).

The sampling process

The sample design is an important part of the research process. Sampling is done in five main steps: defining the target population, choosing the sampling frame, selecting the sample method, determining sample size, and finally implementing the sampling plan

In this research, the following were considered in determining the research sample:

- Finding the exact number of construction workers in Abu Dhabi
- Including all the construction companies listed in Al Adaa registration applications in OSHAD

According to the OSHAD statistics in an email from the project manager of Al Adaa on 20 August 2017, 75 construction companies were registered in Al Adaa employing a total of 132890 workers.

Based on the population size of 132,890 workers, a confidence level of 95% and a confidence interval of 5%, the required sample size to represent the whole population was 383 workers. However, when the population is large the sample size is not an issue (Armitage & Berry , 1994).

Data Collection Methods

Data can be obtained from different sources and, as we have seen, are either primary or secondary.

Secondary data are important for collecting evidence and they have certain advantages. They reduce time, cost, and effort. They are simple to gather and enable researchers to develop a theoretical framework (Saunders, Lewis, & Thornhill, 2015). A literature review also helps researchers to know whether a topic is worth investigating and it gives researchers insight if the research scope has to be limited to a needed area of inquiry (Creswell, 2014).

In this research, the literature review contributed to addressing the problem, stating the main purpose and objective of the study, understanding the topic and deciding some of the main areas to investigate.

The figure below presents the literature map used for this study.

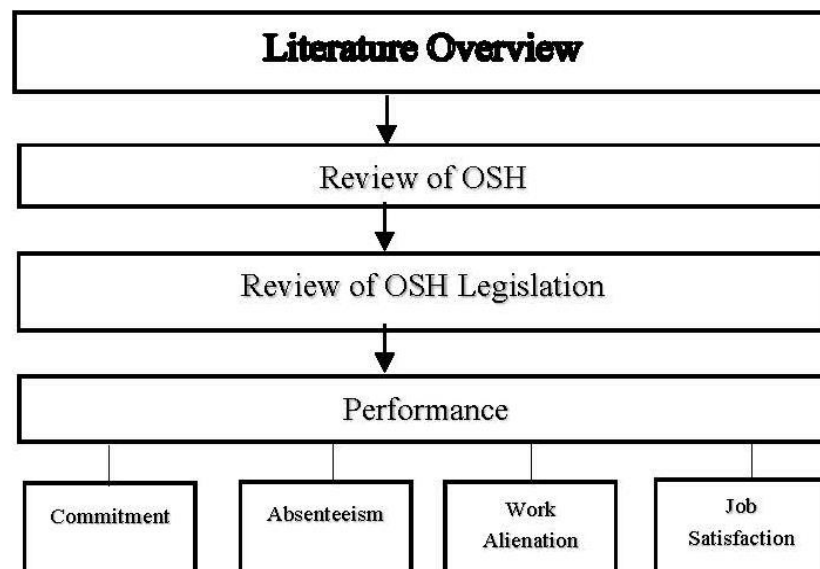


Figure 0-4: Map of the Literature Review

Primary data are original data. The sources of primary data include interviews, questionnaire surveys, and observation (Collis & Hussey, 2009).

A questionnaire is one the many methods of investigation that researchers can employ to collect data. A survey allows quantitative data to be gathered on the trends, thoughts, and attitudes of a sample of a population (Creswell, 2014). Survey questions can be either closed-ended questions or open-ended questions, to which participants can respond freely (Maylor & Blackmon, 2005).

In this study, the construction workers on a site were surveyed, including managers, supervisors and workers. The main languages used in the survey questionnaire were English and Arabic, but it was translated into other languages such as Urdu. The study asked only closed-ended questions.

Questionnaire development

The research questionnaire was the primary tool for collecting data for the present research. Table 5.1 shows the research constructs used in this study.

Research constructs	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Affective Commitment					
Continuance Commitment					
Normative Commitment					
Organizational Commitment					
Absenteeism					
Work Alienation					
Job Performance					
Workers' personal traits					
Implementing H&S on construction sites					

The questionnaire was divided into several parts. Part one was about performance, and consisted of affective commitment, continuance commitment, normative commitment, organizational commitment, absenteeism, work alienation, and job performance. The second part concerned workers' personal traits, namely, self-efficacy, outcome expectancy/self-awareness, actively caring Behaviours, and attitude. Part three covered implementing H&S on construction sites. The elements of H&S were rules for PPE, first aid, and safety in the heat. The last part dealt with general information about the respondents: their job position, gender, education, experience, and finally the type of construction site they were working on at the time.

The target group was workers on construction sites, meaning anyone who has work to do on a construction site: construction company owners, supervisors and workers/labourers.

Because the questionnaire targeted workers on construction sites, most of whom had no internet access, the questionnaire was distributed as hard copy on a number of construction sites in the Emirate of Abu Dhabi and in Al Ain. 461 responses were collected.

The survey had four main parts, concerning performance, workers' personal traits, the implementation of H&S on construction sites, and finally demographic information. In the part of the survey about performance were seven sub-parts, with a total of 46 questions. The seven sub-parts were enquiries about Affective commitment, Continuance commitment, Normative Commitment, Organizational commitment, Absenteeism, Work alienation, and Job performance.

The Likert scale, as the most widely used technique for scaling responses in questionnaire research was used. It measured the level of the respondent's agreement with 46 statements on a symmetrical unlikely-likely scale for each questions. Thus, the Likert scale used in six of the sub-parts was a five-point scale with the following format:

- 1- Strongly agree
- 2- Agree
- 3- Undecided
- 4- Disagree
- 5- Strongly disagree

Data analysis Techniques

The aim of the research is to evaluate the impact of applying OSHAD SF on the performance of workers in the construction sector in Abu Dhabi. This aim was accomplished by analyzing the data obtained from construction company workers in Abu Dhabi. Accordingly, the data set had to be subjected to a few preliminary tests, whose objective was to test the necessary conditions before multivariate analysis. The analysis included testing the normal distribution of variables. Furthermore, to validate the conceptual models and the proposed research hypotheses presented in Chapter Four, structural modeling was conducted using AMOS. The quantitative data were analyzed through successive stages of analysis: preliminary analysis, descriptive analysis and structural modeling. The descriptive analyses were for frequency, percentage, central tendency

measure (such as mean); variability (dispersion) measures such as standard deviation and maximum and minimum scores and some information concerning the distribution of scores (skewness and kurtosis).

This study also included one of the most popular techniques for measuring the center tendency (the mean; that is, the average).

Finally, this study examined the effect of each independent variable on the dependent variables using structural modeling.

Validity and Reliability of Measures

Testing reliability is a necessary step in research, taken to ensure the reliability of the questionnaire is use. It enables researchers to feel confident that all the respondents understand the questions in the same way as the researchers do. According to Mitchell (1996), there are three different approaches can be taken to measure the reliability of questionnaires: test re-test, internal consistency and alternative form.

The most popular technique for testing reliability is Cronbach's Alpha. Reliability is calculated as a figure between 0 and 1. 0 indicates no reliability and 1 indicates total reliability. A value greater than 0.9 is considered perfect, while a value between 0.75 and 0.9 is considered good. Lower than 0.75, however, points to very poor reliability. For the reliability of questionnaire scale, Cronbach Alpha is computed and the elements with Cronbach Alpha of more than 0.60 are considered reliable. (Gliem & Gliem, 2003). The reliability test called Cronbach's Alpha was adopted to examine the correlations and the internal consistency between the questions of the questionnaire; since the questions were divided into 14 groups, the reliability test (Cronbach's alpha) was been calculated for 14 groups as well.

The results of a validity test show the degree to which a scale or set of items accurately reflects the theoretical concept of interest (Hair, Money, Samoul, & Page, 2007). In the present study, a normality test was conducted, and so was a content validity test of the questionnaire statements using material from the literature review.

Ethical Considerations

Ethical considerations are among the most important sections of a research study. Bryman and Bell specify ten principles of ethical consideration. These principles were developed by analyzing the ethical guidelines of nine professional social sciences research associations. In their book these

writers mention that participants should not be subject to harm or destruction. Respect for the participants' dignity is also required. It is important also to get full consent from the participants before conducting the study. Researchers must protect the participants' privacy and provide them with an adequate level of confidentiality. In their work, researchers should ensure the anonymity of individuals and organizations. Researchers should also avoid any deception about the study's objectives and goals. At the same time, researchers must announce any forms, sources of funding, and any possible conflicts of interest. It is essential to avoid misleading information and the biased presentation of primary data. Finally, being honest and transparent is vital when communicating anything that relates to the study (Bryman & Bell).

Research Process

This research had several main processes, described below.

The first section of the research covered the introduction to the topic. This included the research problem and research significance. At the same time, it highlighted the main components of the study, its aims, objectives and questions.

The first section of the research also presented the research hypothesis and briefly outlined the scope and methodology of the thesis. This section also included the literature review about OSH situation worldwide, the UAE and Abu Dhabi and the literatures on OSH legislation together with performance, organizational commitments, and personal traits. This occupied Chapters One, Two and Three.

The second section of the research, Chapters Four and Five covered the questionnaire design and development and presented the theoretical research framework and research methodology.

The third section of the research, Chapters Six and Seven is the analytical part. This section presented a descriptive and ranking analysis comprising factor analysis, a reliability test and tests for data normality and common method bias in order to examine the suitability of the sample and the applicability of the survey data. This section also presented the results of the key analysis conducted for the study in order to test the hypotheses developed for Chapter Four and the research framework. Several statistical tests were reported, such as correlation analysis, regression analysis, and structural modeling using AMOS and relevant charts were used to illustrate the findings.

The **fourth section** of the research consisted of discussion. This section aimed to present a detailed discussion on the results of each hypothesis in light of the research aim, research subject and literature review of the key studies.

The **last section** discussed and summarized the major findings of the research. This section briefly presented the conclusions drawn and outlined the researcher's own view of the strengths and weaknesses of the research approach. The chapter included also the contribution of knowledge made by the research and recommendations for future researchers.

The following figure presents the processes that were followed to pursue the research process and answer its main questions.

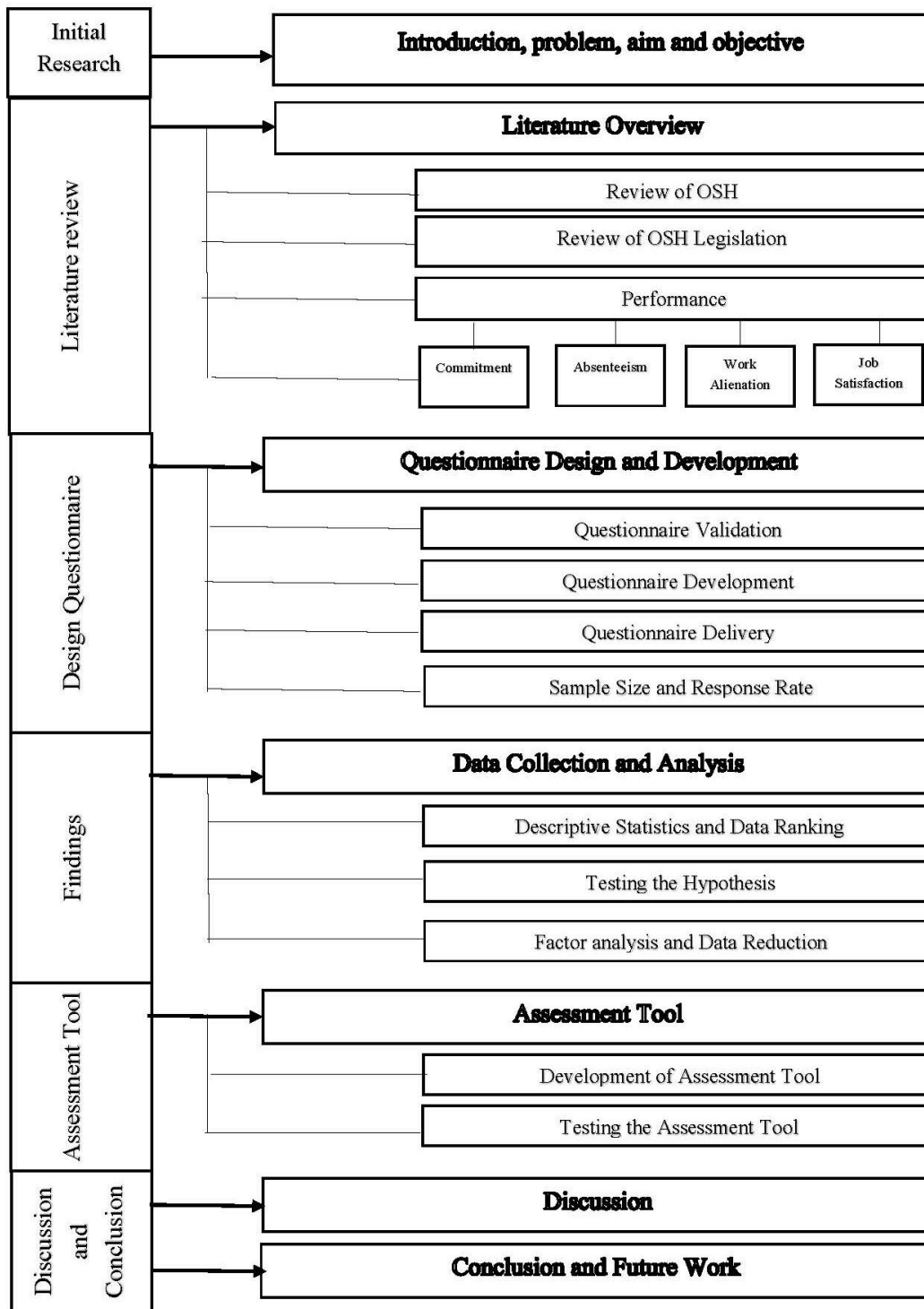


Figure 0-5: Research Process

Summary

This chapter covers many important aspects related to the study methodology. This study is positioned in the positivist research paradigm, and adopted quantitative methods. It used a questionnaire survey as the main data collection method following solid procedures recommended by other researchers. Its first section covered various philosophies of research different. It also presented the methods of quantitative, qualitative and mixed research. The chapter also covered the research design and processes. Finally, it covered the main points related to ethical considerations in research.

CHAPTER SIX: DESCRIPTIVE STATISTICS AND RANKING ANALYSIS

Introduction

This chapter discusses the design of the research questionnaires developed to conduct the survey in this study. It also presents the descriptive and ranking methods of analysis: factor analysis, and the testing of reliability, data normality and common method bias in order to examine the suitability of the sample and applicability of the survey data.

Checking Common Method Bias

There are several methods for determining the variance of the common method. One of the best known is the test for a Harman factor. Focusing on statistical remedies, the Harman single factor test is undertaken in order to identify possible problems due to the variance bias of a common method. This procedure is carried out through an exploratory factor analysis with all the variables of interest and the total variance explained matrix of the factors is analyzed (Fuller et al., 2016). In the event that a single factor emerges, or if only one represents most of the explained variance, it is concluded that the variables are contaminated by the variance of the common method. This method is easy to execute but it is not very conservative and establishing the severity of the effects of the method is confusing. On the one hand, the possibility of finding a single factor (or a majority factor) declines as the number of variables analyzed increases. Thus, when many variables are analyzed, it is almost certain that several factors will appear regardless of the presence of some systematic bias. On the other hand, even when a single factor is detected, it is very difficult to know how much variance of the common method contaminates the observations. Even if two (or more) dominant factors are observed, it would be complex to establish whether the data share any effect of the method (Tehseen, Ramayah, & Sajilan, 2017).

For the study under consideration, the results of the common method bias test are represented in the following table. The results obtained from the above techniques reveal that variance of the common method is not a problem in this investigation, since it was found that no single factor was identified that explained the variance of all the items. Therefore, the results suggest that a common variance bias was not likely to exist. The test was justified because it shows the total percentage of variance to be 37.517% which is less than 50%. Hence, it can be said that the results do not indicate the presence of a substantial amount of variance of the common method since there was no general factor that agglutinated most of the variance. Besides, the bias of common variance did

not affect the research data, because the existing variance in the data may be due to the constructs evaluated and not to the evaluation method (Fuller et al., 2016).

Total Variance Explained						
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	37.661	38.041	38.041	37.142	37.517	37.517
2	11.205	11.318	49.359			
3	5.658	5.716	55.075			
4	4.534	4.579	59.654			
5	4.224	4.267	63.921			
6	3.237	3.269	67.191			
7	2.612	2.639	69.830			
8	2.258	2.280	72.110			
9	1.873	1.891	74.002			
10	1.664	1.681	75.683			
11	1.452	1.466	77.149			
12	1.266	1.279	78.428			
13	1.080	1.091	79.519			
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Assessing Data Normality

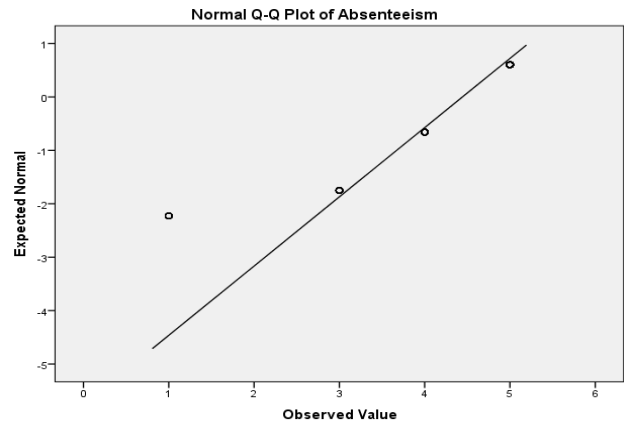
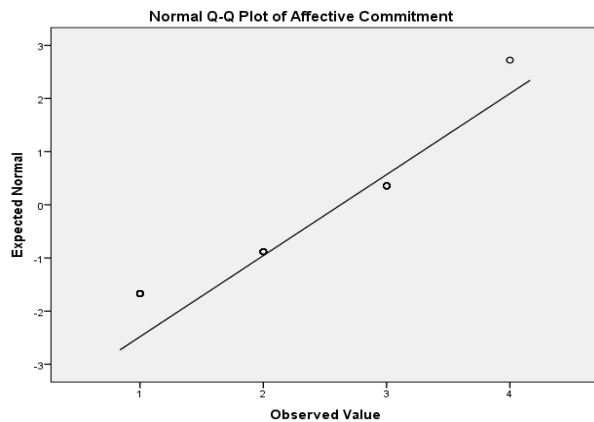
Normality tests are used to verify whether the probability distribution associated with a data set can be approximated by the normal distribution. In order to assess the normality of data, a parametric test can be performed in which the SPSS administered both the Kolmogorov-Smirnov test with the Lilliefors correction and the Shapiro-Wilk test. The Shapiro-Wilk test was specifically considered for this study because of having a large sample. The results for the test are shown in the following table and indicate that a $p\text{-value} < 0.05$, which implies that the data were not normally distributed. However, data normality is not an issue for this study because Ghasemi & Zahediasl (2012) believe that, for a large sample, usually one greater than 100, normality tests are excessively conservative and might encourage us to reject the assumption of normality too easily. Therefore, an assessment of Q-Q plots or Histogram is suggested for evaluating the normality of the data; these are more appropriate for larger sample sizes (Ghasemi & Zahediasl, 2012).

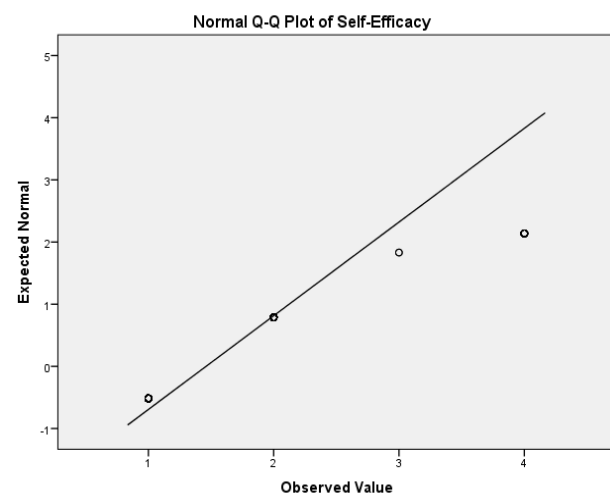
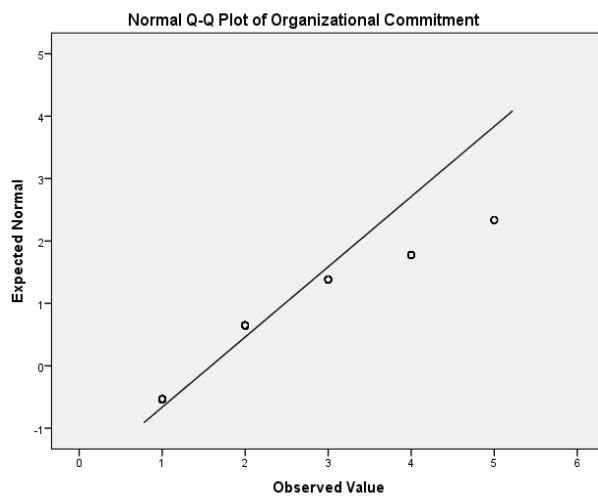
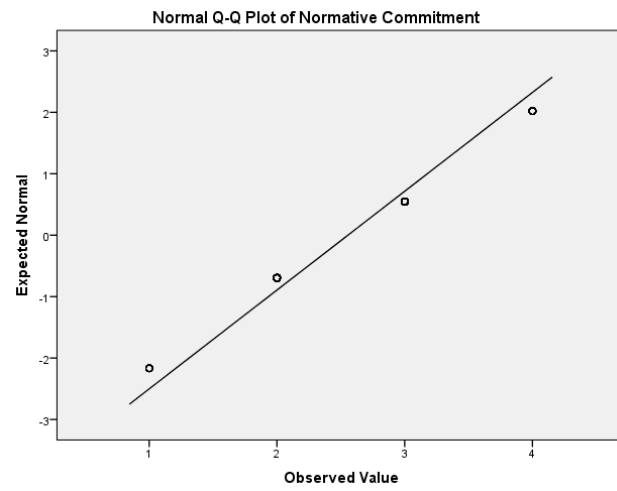
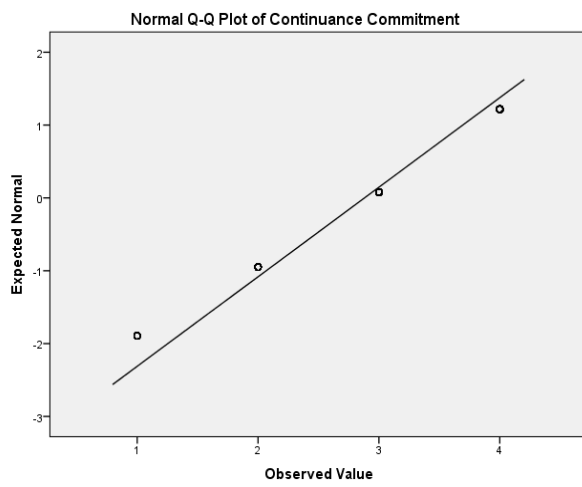
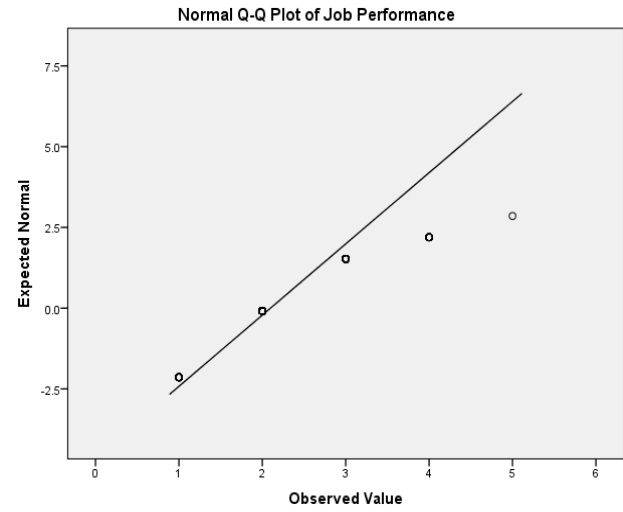
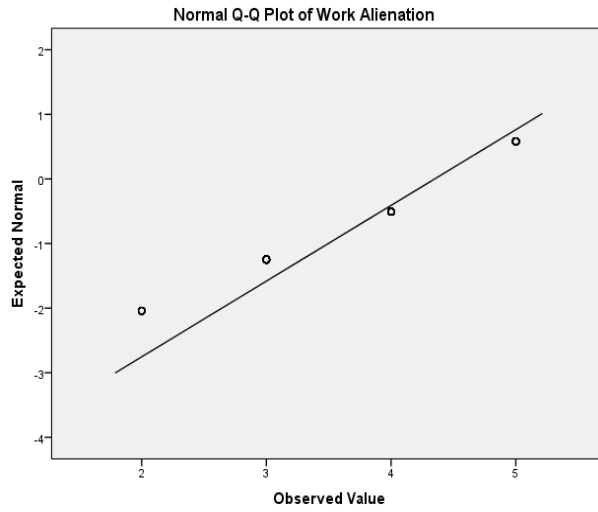
Tests of Normality		
	Kolmogorov-Smirnov ^a	Shapiro-Wilk

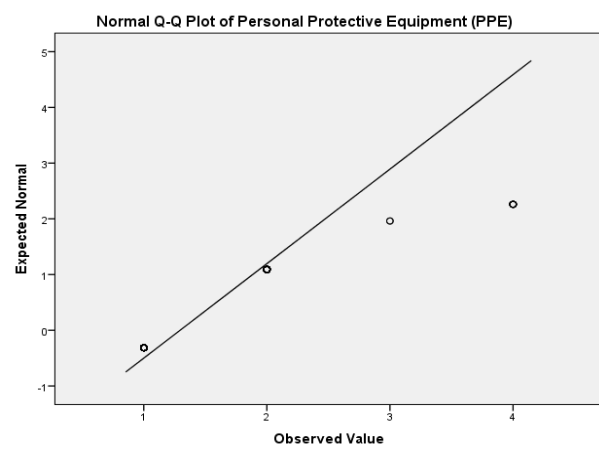
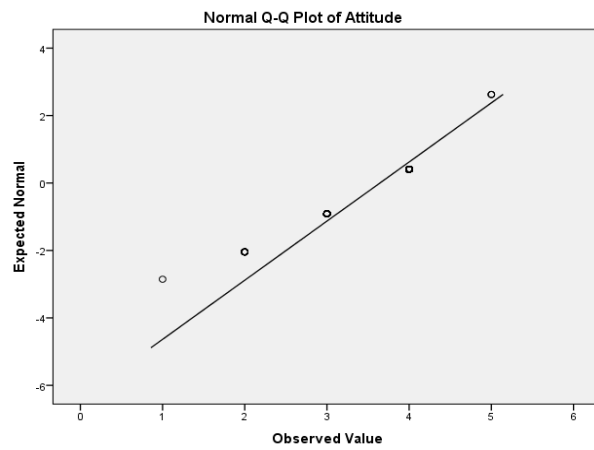
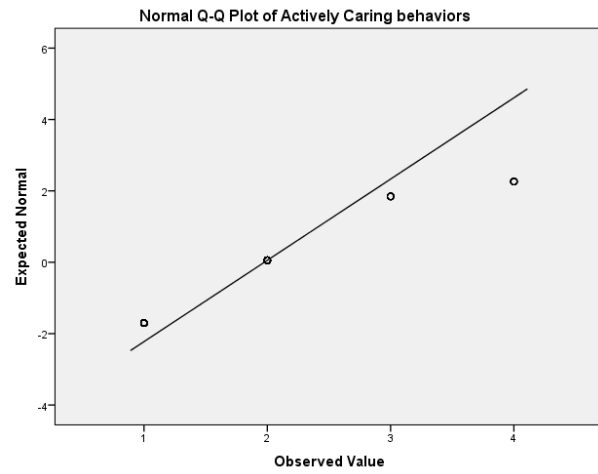
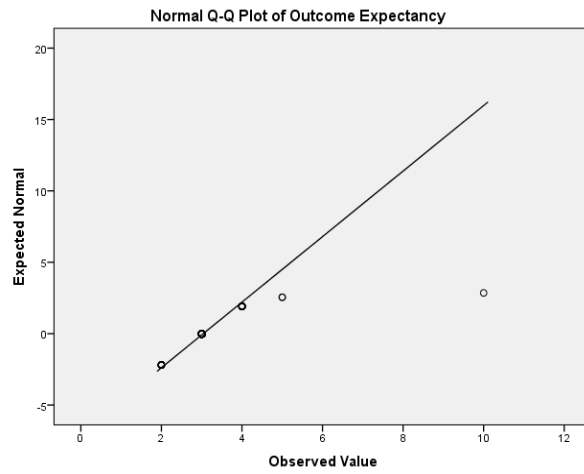
	Statistic	df	Sig.	Statistic	Df	Sig.
Affective Commitment	.431	461	.000	.627	461	.000
Absenteeism	.310	461	.000	.645	461	.000
Work Alienation	.337	461	.000	.740	461	.000
Job Performance	.483	461	.000	.468	461	.000
Continuance Commitment	.274	461	.000	.851	461	.000
Normative Commitment	.305	461	.000	.783	461	.000
Organizational Commitment	.339	461	.000	.677	461	.000
Self-Efficacy	.361	461	.000	.641	461	.000
Outcome Expectancy	.488	461	.000	.240	461	.000
Actively Caring behaviours	.437	461	.000	.462	461	.000
Attitude	.410	461	.000	.666	461	.000
Personal Protective Equipment	.444	461	.000	.529	461	.000
First Aid	.478	461	.000	.472	461	.000
Safety in the Heat	.449	461	.000	.526	461	.000

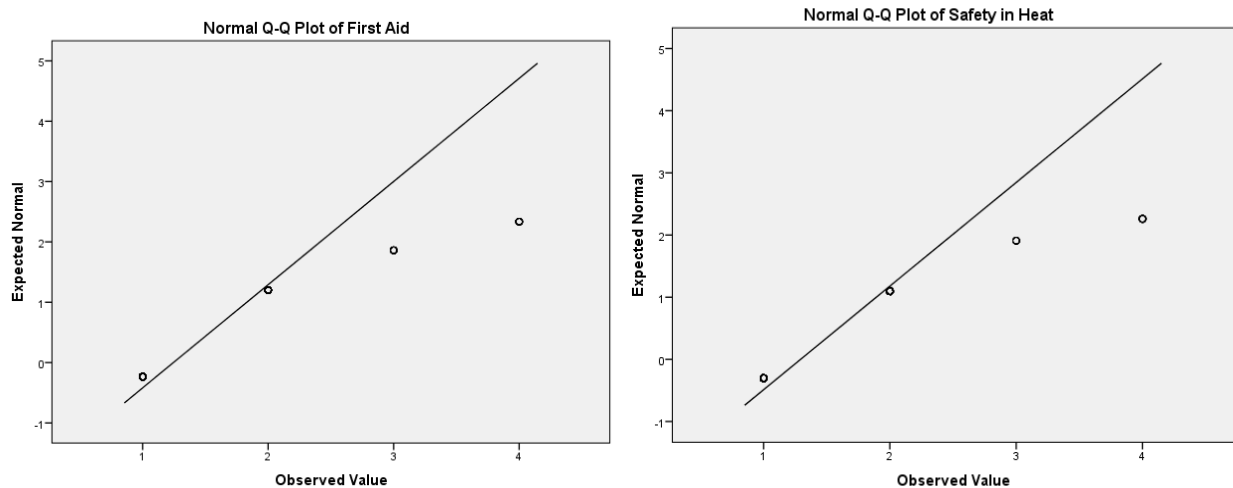
a. Lilliefors Significance Correction

Based on the opinion of Ghasemi & Zahediasl (2012), the Q-Q plots for each of the variables are shown below. The normal Q-Q plot is another way of graphically representing the normality of data. However, the following results of Q-Q plots represent that the scatters are close to the line, which implies that the data are more or less normally distributed.









Descriptive Analysis

The following section presents descriptive analyses of the collected data and summarizes the findings. Descriptive analysis measures the spread/ variability of the data and also the central tendency. Measuring variability will include kurtosis and skewness, the minimum and maximum variables, and variance/ standard deviation, while measuring the central tendency will include the mode, median and mean.

Descriptive analysis of Performance

Performance in the corporate world is not a phenomenon, but a philosophy. The entire corporate world is based on the performance of employees and employers. The survival and success of a company is especially closely related to the performance of employees (Mikolajczyk & Schmid, 2005).

The research covered seven headings in this context, namely, affective commitment, continuance commitment, normative commitment, organizational commitment, absenteeism, work alienation, and finally job performance.

It is important also to mention the social exchange theory which been covered previously in section 3.6 which states that workers are willing to perform better in the work-place where they feel that the organization appreciates their efforts. It focuses on the exchange relation between employers and employees. This theory suggests when the company invest more on health practices, this will reflect in their performance and commitment.

Employees' relationship with their organization has different facets, measured in different ways. For example, the emotional bond described in their affective commitment is considered one of the main determinants of dedication and loyalty. Studies have examined this relationship, covering the variables of commitment, employee turnover, absenteeism, and so on.

Commitment is the act of pledging or binding made by an employee to a set of Behaviours; it motivates this individual to act in a particular way. Today, measuring the improvement of performance in an organization should go beyond effective leadership and management performance and should to engage with the level of emotional commitment of the employee. Commitment is the factor that differentiates between average and top performing organizations. When employees feel emotionally engaged, their productivity increases and becomes more customer-focused, which has a positive impact on the organization's financial performance (Fornes & Roco, 2004).

Affective Commitment

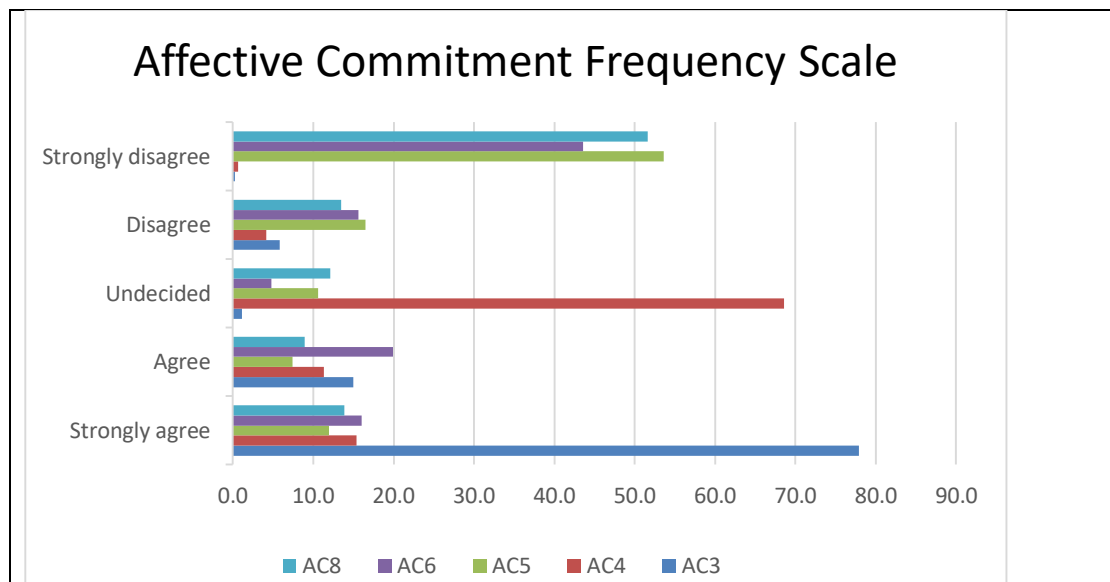


Figure 0-1: Affective Commitment Frequency Scale

The affectively committed employees are those who have a sense of belonging which involves them in various organizational activities. At the same time, they work hard and want to follow the organization's objectives. They also are willing to stay with the organization for a long time (Rhoades, Eisenberger, & Armeli, 2001).

Eight questions were developed in this sub-part. Three of them, AC1, AC2, and AC7, were excluded after the reliability test,.

Question 3 (AC3) was about the statement "I really feel that the H&S problems in this company are my own, and I will try my best to solve them ". The results show that 77.9% of respondents strongly agreed with it and 0.2% strongly disagreed. The responses to the statement in question 4 (AC4), "I think I could easily become as attached to another company and new employer as I am to this one" were undecided (68.5%), strongly agree (15.4%) and strongly disagree (0.7%). Question 5 (AC5) stated "I do not feel like 'part of the family' at this company", and the answers were strongly disagree (53.6%), and disagree (16.5%). Regarding question 6 (AC6) about the statement "I do not feel 'emotionally attached' to my employer/company", strong disagreement was felt by 43.6% are while 'agree' represented 20% of responses are. Finally, question eight (AC8), "I do not feel a 'strong' sense of belonging to my employer company", showed strongly disagree as the response of 51.6%, disagree applied to 13.4 while 13.9% strongly agreed.

Continuance Commitment

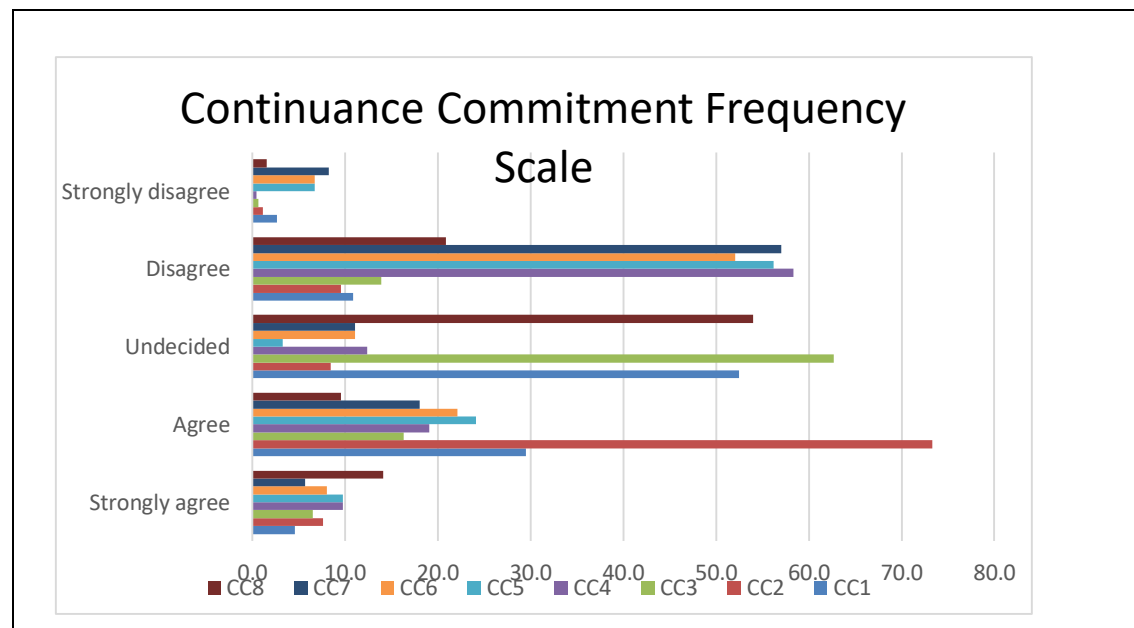


Figure 0-2: Continuance Commitment Frequency Scale

Continuance commitment occurs when employees compare the pros and cons of leaving an organization. They may feel that they need to stay at the company, because the loss they will experience by leaving it is greater than the benefit they think they might gain in a new role.

Eight questions were developed in this sub-part. The statement in question 1 (CC1) was “I am not afraid of what might happen if I quit my current job without having another one lined up”. The respondents were undecided (52.5%), agree (29.5%), and disagree (10.8%). Question 2 (CC2) took the statement “It would be very hard for me to leave my employer company right now, even if I wanted to”. The answers were agree (73.3%) compared to disagree (9.5%). Question 3 (CC3) asked for responses to “Too much in my life would be disrupted if I decided to leave this company now”. The responses varied between undecided (62.7%), and agree (16.3%). The answers to question 4 (CC4), “It would not be too costly for me to leave the company now” were disagree (58.4%), and agree (19.1%). Question number 5 (CC5) was on the statement “Right now, staying with my company is a matter of necessity as much as desire”. The answers were disagree (56.2%), vs. agree (24.1%). Regarding question 6 (CC6), 52.1% disagreed with the statement “I feel that I have very few options to consider leaving this company”, the answers while 22.1% agreed. Question 7 (CC7) took the statement “One reason that stops me from leaving this job at this company is that I will not find a new job somewhere else”. The answers were disagree (57%) and agree (18%). Finally, the answers in question 8 (CC8) were in response to “One of the major reasons I continue to work for this company is that I will not find another company that offers the same benefits I have here” has the following answers: undecided (54%), disagree (20.8%) and strongly agree (14.1%).

Normative Commitment Scale

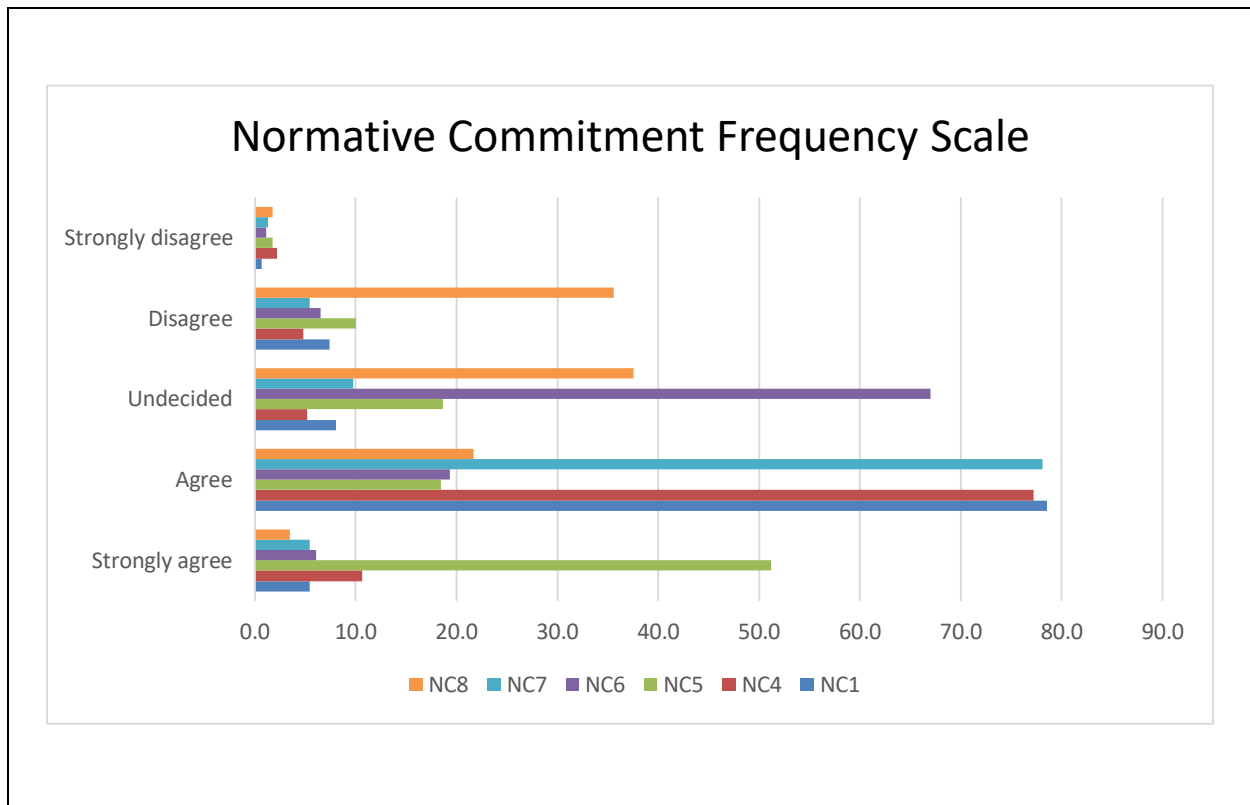


Figure 0-3: Normative Commitment Frequency Scale

Normative commitment shows the sense of obligation to stay, even if the employees are unhappy in their role, or want to pursue something better.

To examine the level of normative commitment of workers in the construction companies, eight questions were developed, but two of them (NC2) and (NC3) were excluded by the reliability test.

The answer to the statement in question 1 (NC1), “I think that people these days move from one Construction Company to another too often”, were (78.5%) agree, and (7.4%) disagree. Question 4 (NC4) had the statement “One of the major reasons I continue to work in this company is that I believe loyalty to your recent employer is important and therefore feel a sense of moral obligation to remain”. The answers showed agree (77.2%), and disagree (4.8%). Regarding question 5 (NC5) with the statement “If I got another offer for a better job elsewhere, I would not feel it was right to leave this company”, the answers were strongly agree (51.2%), undecided (18.7%), and agree (18.4%). Question 6 (NC6) carries the statement “I was taught to believe in the value of remaining loyal to one company and one employer”, to which respondents answers were undecided (67%), and agree (19.3%). Question 7 (NC7) was about the statement “Things were better in the days

when people stayed in one company for most of their careers”. Most respondents agreed (78.1%)but 9.8% were undecided. The last question (NC8) asked about the statement “I do not think that to be a ‘company man’ or ‘company woman’ is sensible and important any more”. ‘Undecided’ described some respondents (37.5%) but 35.6% disagreed and 21.7% agreed.

Organizational Commitment

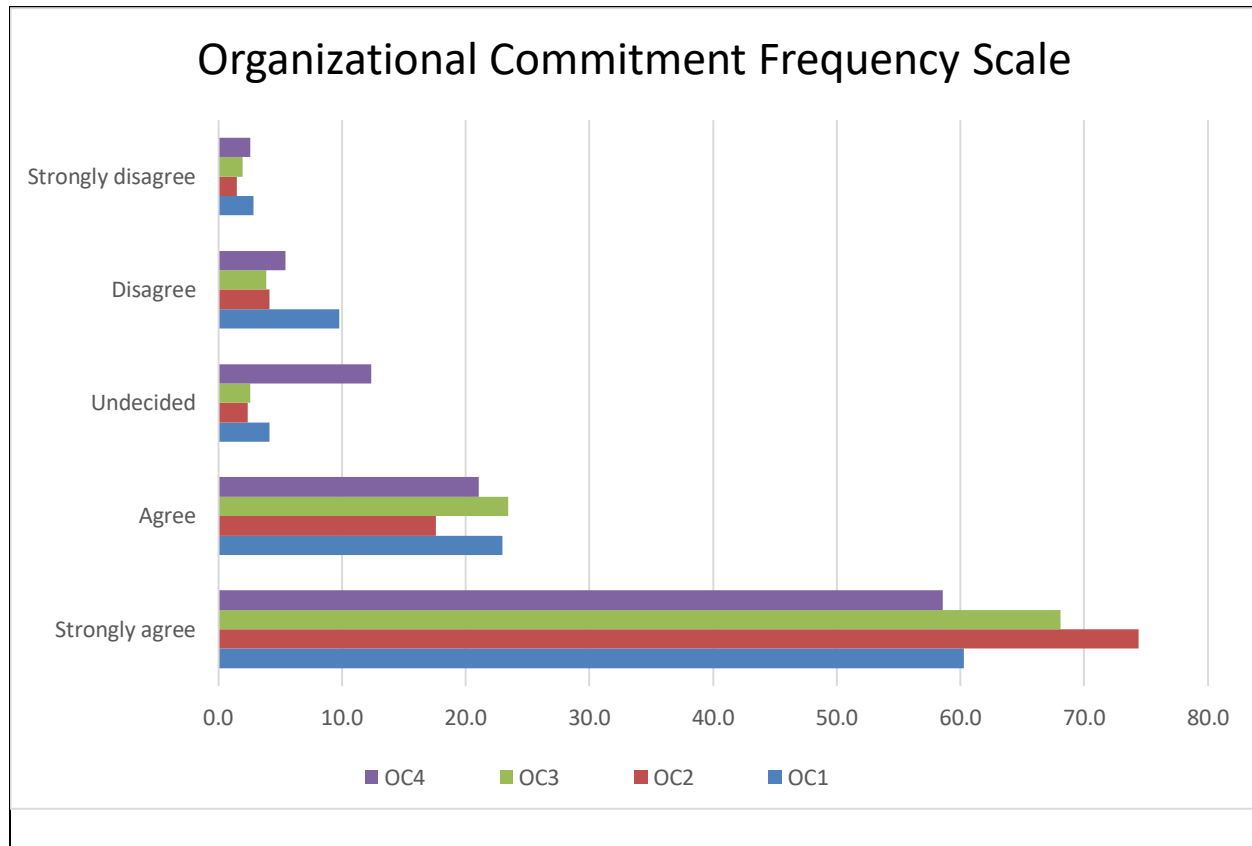


Figure 0-4: Organizational Commitment Frequency Scale

As mentioned earlier, the first part of the survey consists of seven sub-parts. The last sub-part covered organizational commitment. This sub-part examined the direct level of commitment between the workers and the construction companies that had been included in the survey.

In this sub-part, four questions were developed. The first question (OC1) took the statement “This organization makes personal sense to me”, and the answers were strongly agree (60.3%) and agree (23%), while 2.8% of the participants strongly disagreed. Question 2 (OC2) concerned the statement “I feel a strong commitment to this organization”. The answers were strongly agree (74.4%), agree (17.6%), and strongly disagree (1.5%). The answers to question 3 (OC3) with the statement “I feel myself a member of the family in this organization” were strongly agree, (68.1%),

agree, (23.4%) and strongly disagree (2%). Finally, question 4 (OC4) gave responses to the statement “I feel myself emotionally engaged with this organization” as strongly agree (58.6%) agree (21%) and strongly disagree (2.6%).

As shown in the above figure, the organizational commitment level can be considered high.

Absenteeism

Absenteeism is one of the major problems of today’s corporate world causing great losses to profitability and national economies. Organizations are now paying more attention to improving work and reducing absenteeism. Many studies have been written in the search for the factors underlying workers’ absences, (Hanna & Awad, 2005).

According to (Beesley, 2013), one important way of preventing sickness absenteeism is to develop better conditions and relationships in the work-place and better management of sickness absence when it arises.

The figure below illustrates the frequency of absenteeism in the construction companies of interest.

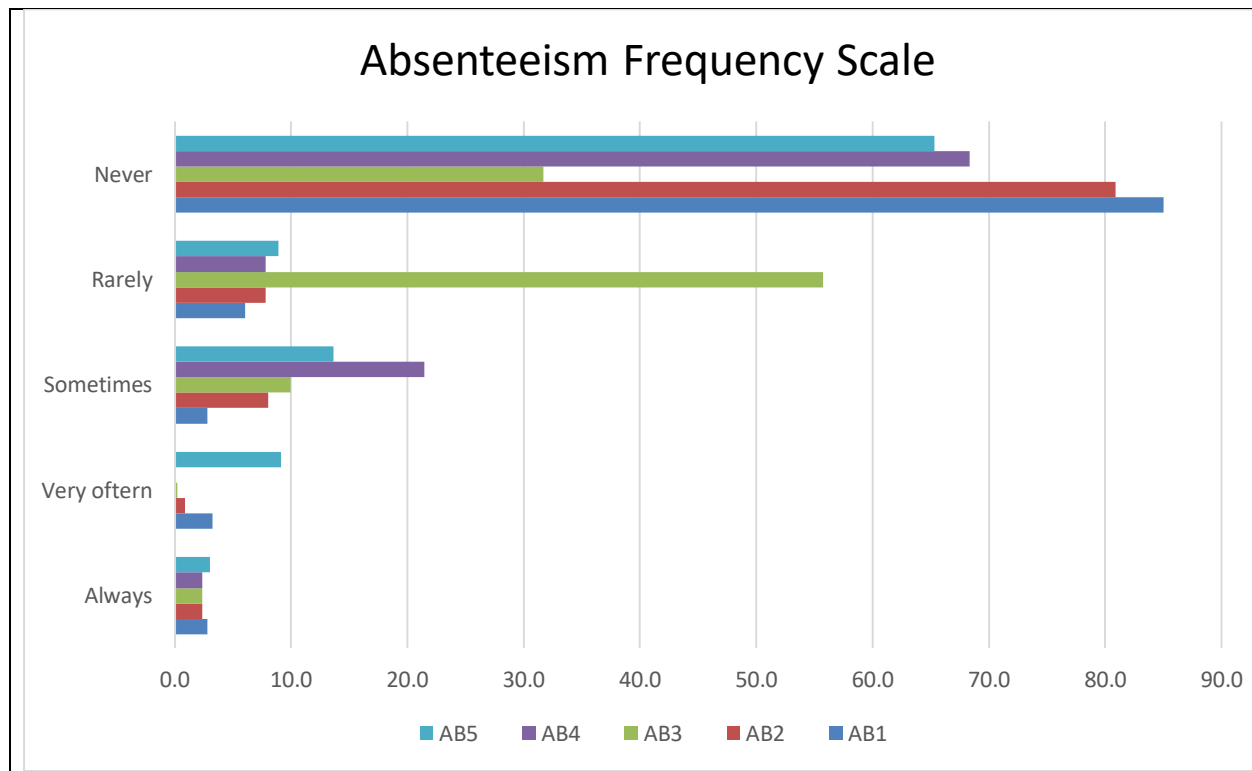


Figure 0-5: Absenteeism Frequency Scale

The rationale behind the questions on this topic was to evaluate the level of absenteeism in the chosen companies. Five questions were developed, using a scale of never, rarely, sometimes, often and very often. Question one (AB1) asked "In the last week, how many times did you miss some hours of the total working hours (arrive late to work, or leave early)". The results show that 85% of respondents never missed hours and 2.8% always did so. Question two (AB2) asked "In the last month, how many times did you miss the entire workday because of health or physical problem?" In answer to this question 80.9% of the respondents stated that they never missed an entire workday because of health or physical problems, and 2.4% always did. Question three (AB3) was "In the last month, how many times did you miss the entire workday because of other reasons like annual leave?". The answers suggested that 31.7% of the respondents had not done so, (55.7) had rarely done so but 2.4% had. Regarding question four (AB4), "In the last month, how many times did you miss the entire workday because you did not feel like going to work?", the answers were that 68.3% of the respondents had not done so, and (2.4%) had. Finally, question five (AB5) asked " In the last month, how many times did you come to the construction site early, go home late, or work on your day off?", and the answers to this question were that 68.3% had done none of these things and 2.4% had regularly done them.

It is clear from the above that the level of absenteeism among workers in the surveyed construction companies is very, which suggests that the conditions and relations in the work-place are well-developed.

Work Alienation

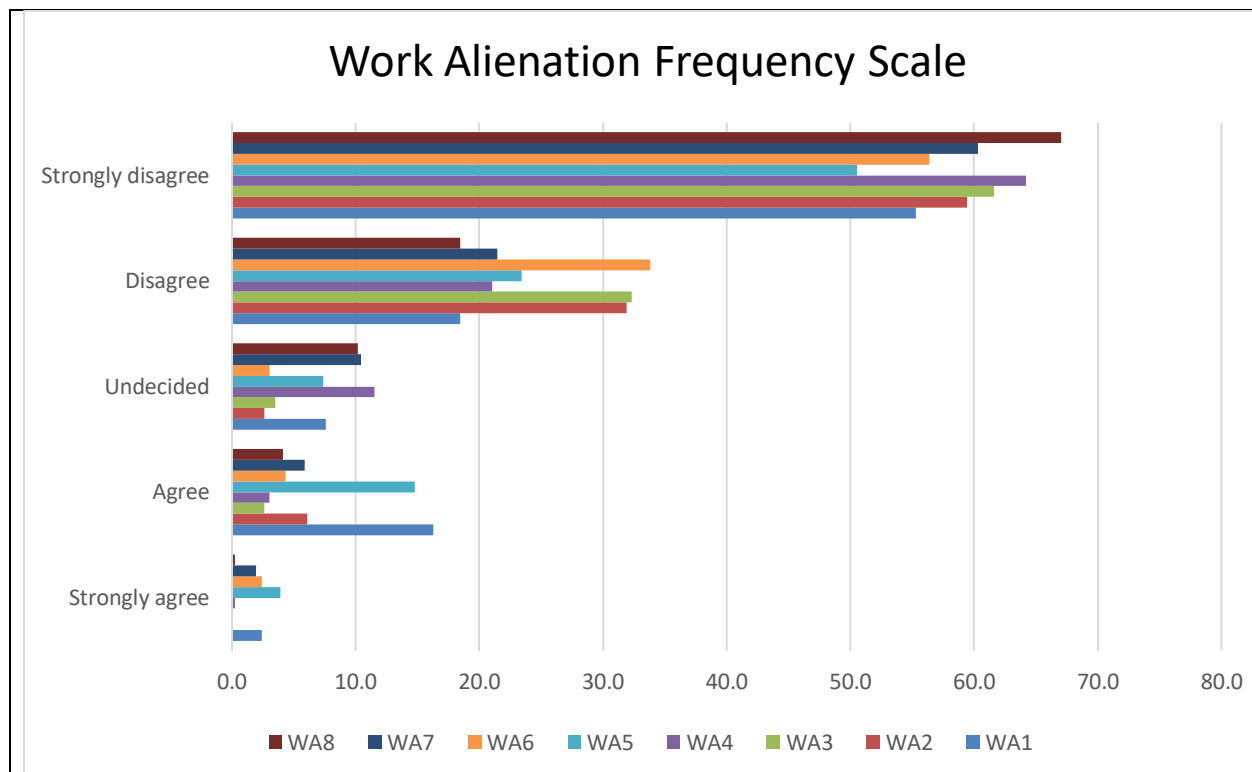


Figure 0-6: Work Alienation Frequency Scale

Different researchers have studied the term ‘alienation’ and used it to describe how people may become indifferent to their work. Research shows that workers may feel alienation from their work when they have no control over the design and production of their work. Work alienation has been found to negatively affect the attitudes of employees to their job duties and job performance.

The survey included eight questions to assess alienation. The statement to respond to in Question 1 (WA1) was “I am not pleased about what I do in my organization; I spend time there only to be paid”. The responses were strongly disagree (55.3%), and strongly agree (2.4%). The second statement (WA2) was “It is a painful and boring experience to face my daily duties in my organization”. The answers were strongly disagree (59.4%), and strongly disagree (0%). Question 3 (WA3) used the statement “For me working is rather drudgery or a burden.”. The responses showed strongly disagree (61.6%), and no-one (0%) who strongly agreed, though (2.6%) agreed. Question 4 (WA4) wanted a response to the statement “I feel myself detached/distanced in my organization”. The answers were strongly disagree (64.2%), and strongly agree (0.2%). The answer about the statement in question 5 (WA5), “I wish I was doing something different” were strongly disagree (50.5%) and strongly agree (3.9%). Question 6 (WA6) considered the statement

“Over time, I have become disappointed about my job.” The responses included strongly disagree (56.4%), and strongly agree (2.4%). The answers to the statement in question 7 (WA7), “I do not feel like putting more effort into my job” were strongly disagree (60.3%), and strongly agree (2.0%). Finally, question 8 (WA8) carried the statement “I do not feel engaged in the events occurring around me in my organization (I do not care about anything)”. The responses were strongly disagree (67%), and strongly agree (0.2%).

From the questions developed to examine the degree of alienation in construction companies, the results show that workers have no marked tendency to this condition. Most of the responses (50%) and above, suggested strong disagreement.

Job Performance

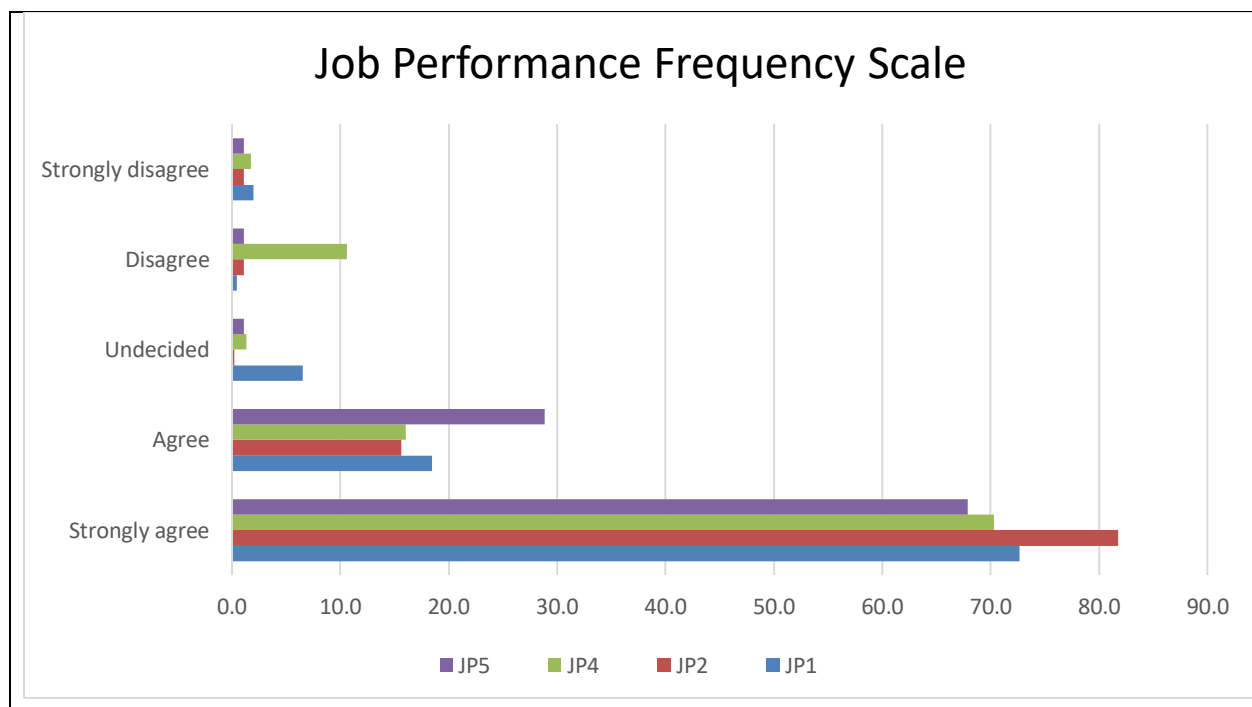


Figure 0-7: Job Performance Frequency Scale

There is a close relationship between the OSH and performance, especially of the workers on construction companies. Performance is entirely dependent on the health of individual workers. If the workers are healthy they can make a big contribution but if they are not cared for by the companies then their performance can be poor (Zacharatos & Iverson, 2005).

The rationale behind this section in the survey is to evaluate the performance level from the point of view of the workers themselves. The above figure illustrates the responses of the participants in terms of job performance. Five questions were listed, one of which (JP3) was excluded due to failing the reliability test. Question 1 (JP1) carried the statement “I always complete the tasks involved in the job description in my work-place”. The answers included strongly agree (72.2%), and strongly disagree (2.0%). The second question (JP2) wanted responses to “I fulfill my responsibilities as required by my job.”, and found that strongly agree (81.8%) and strongly disagree (1.1%) were the main ones. The answers about the statement in question 4 (JP4), “I do not neglect the tasks as required by my job.” were strongly agree (70.3%), and strongly disagree (1.7%). The last question in this section of the survey (JP5) used the statement “I fulfill the formal tasks as required by my job”, to which the answers were strongly agree (67.9%), and strongly disagree (1.1%).

From the above we can see clearly that workers in the examined construction companies were fulfilling their formal responsibilities and tasks, and that about 70% or more considered their performance was high.

Descriptive analysis of Workers Personal Traits

The performance of a worker varies, of course, from one to another. Several factors may affect this performance. For years, researchers were trying to identify the main personality traits that are most desired in the work-place, and if any specific criteria distinguish one personal trait from another. Some employers may prefer conscientious employees, while others prefer more open-minded workers. thinking that such people are more likely to accept changes and new directions.

The four sub-parts of the second part of the survey asked about the workers’ personal traits; it covered self-efficacy, outcome expectancy/self-awareness, actively caring behaviours, and attitude.

Self-Efficacy

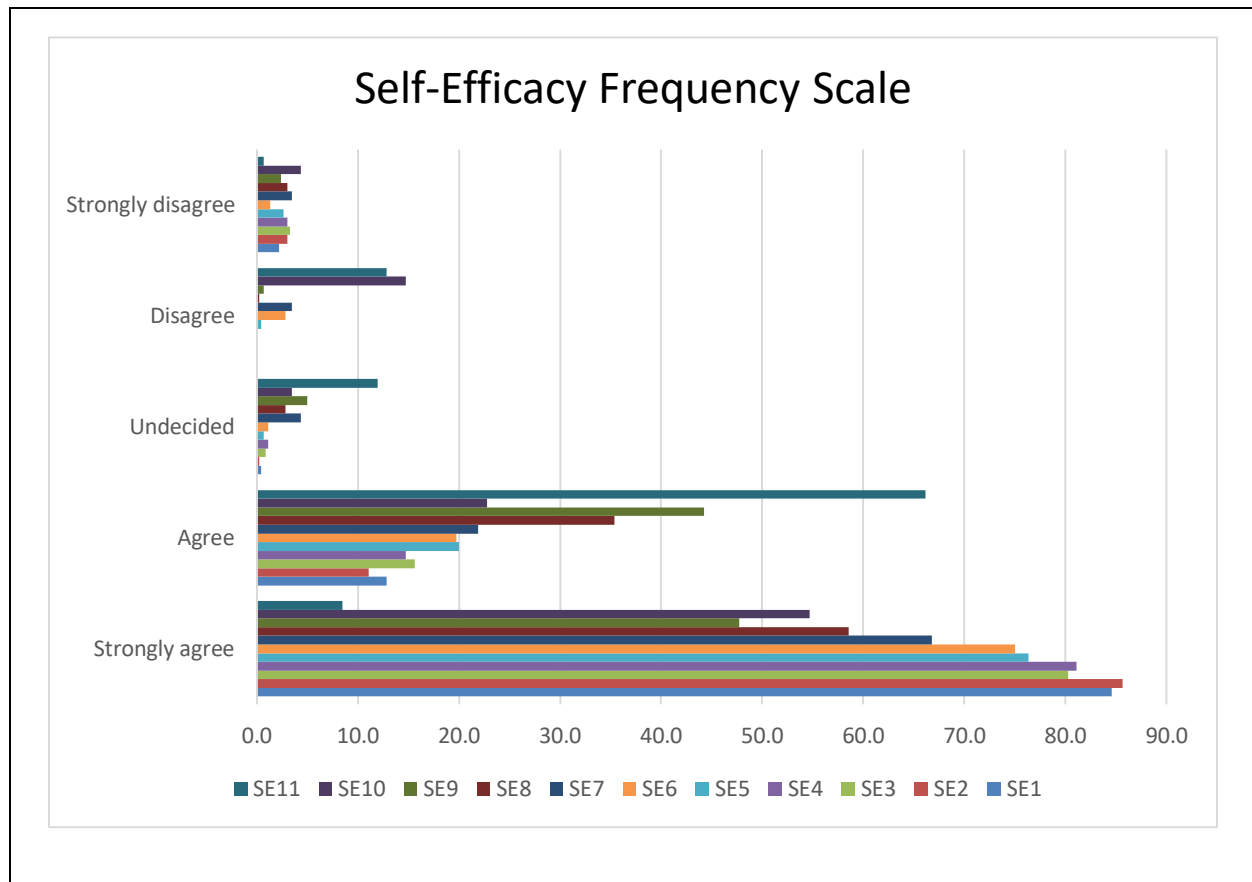


Figure 0-8: Self-Efficacy Frequency Scale

As mentioned earlier Self-efficacy is the belief that we have in our own abilities, specifically our ability to meet the challenges ahead of us and complete a task successfully. The survey included eleven questions to evaluate self-efficacy. The first question (SE1) used the statement “I see myself as someone who look out for my own safety”. The answers were strongly agree (84.6%), and strongly disagree (2.2%). The second question (SE2) centered on “I see myself as someone who looks out for the safety of my co-workers”, and the answers were strongly agree, (85.7%) and strongly disagree (3%). Question 3 (SE3) used “I see myself as someone who helps a co-worker do a job more safely”, and the answers were strongly agree (80.3%), and strongly disagree (3.3%). The results of question 4 (SE4) took as its statement “I see myself as someone who identifies risky work behaviour in a co-worker”. They were strongly agree (81.1%), and strongly disagree (3%). Question 5 (SE5) carried the statement “I see myself as someone who keeps safe at work and still gets the job done on time”, to which the answers were strongly agree (76.4%), and strongly disagree (2.6%). The answers of question 6 (SE6) about the statement “I see myself as someone

who will stop a team member in my work area if I think they are doing something risky” were strongly agree (75.1%), versus strongly disagree (1.3%). Question 7 (SE7) carried the statement “I will stop someone working outside my work area if I think they are doing something risky”, and the answers were strongly agree (66.8%), and strongly disagree (3.5%). Question 8 (SE8) concerned the statement “I see myself as someone who will stop a co-worker with more experience on the job than me if I think they are doing something risky”. The answers were strongly agree (58.6%), and strongly disagree (3%). The answers to question 9 (SE9) in which the statement was “I see myself as someone who deals with most safety issues” were strongly agree (47.7%), agree (44.3%), while 2.4% strongly disagreed. Question 10 (SE10) bore the statement “I see myself as a strong person who will not have an accident at work”. The answers were strongly agree (54.7%), and strongly disagree d (4.3%). Finally, question 11 (SE11) called for a response to the statement “I see myself as someone who is at risk off an accident while working, even if I regularly comply with the safety rules”. The answers are strongly agree(8.5%), agree (66.2%), and strongly disagree (0.7%).

Outcome Expectancy/Self Awareness

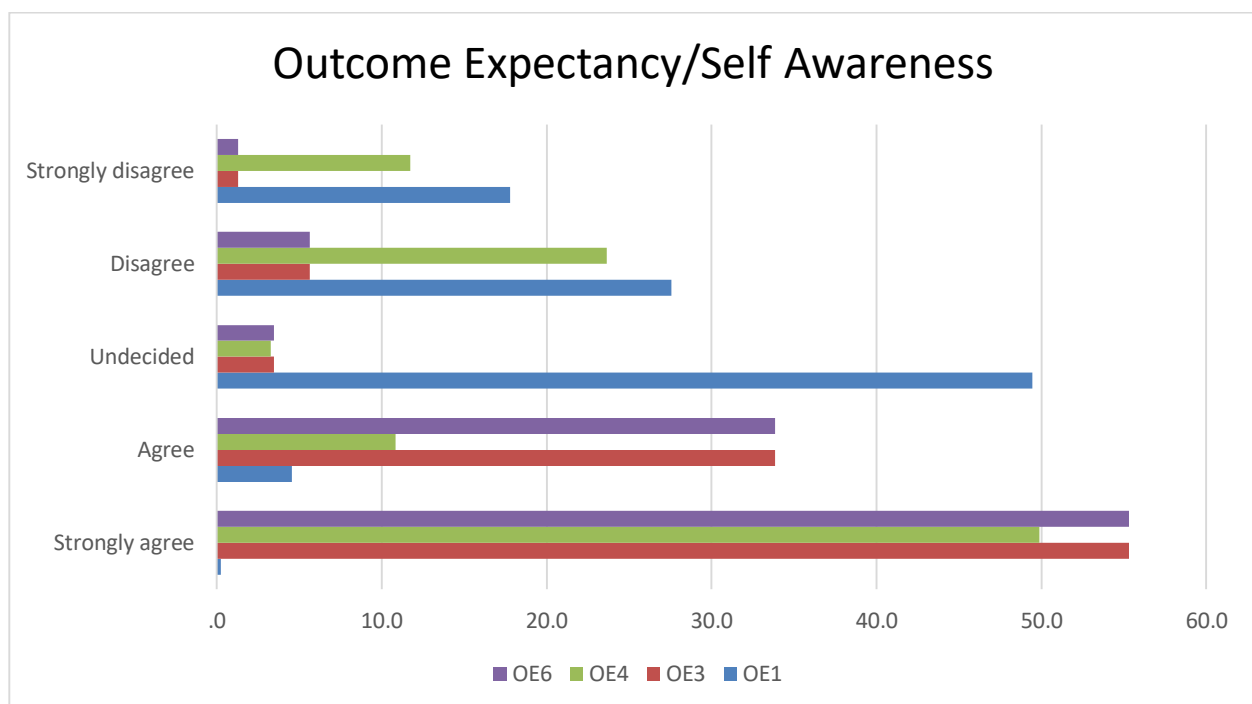


Figure 18: Outcome Expectancy/Self Awareness Frequency Scale

This sub-part contained six questions, two of which (OE2, and OE5) were excluded due to the findings of the reliability test. Question 1 (OE1) took the statement “If I skip safety rules I will feel disappointed in myself”. The answers were strongly agree (0.2%), agree (4.6%), and strongly disagree (17.8%). Question 3 (OE3) was about the statement “If I skip safety rules I will feel more comfortable”. The answers were strongly agree (55.3%), agree (33.8%), and strongly disagree (1.3%). Question 4 (OE4) used the statement “If I skip safety rules I will be injured”. The answers were strongly agree (49.9%), agree (10.8%), and disagree (23.6%). Finally, question 6 (OE6) used the statement “If I do not follow the safety rules at work, my colleagues will blame me”, to which the answers were strongly agree (55.3%), agree (33.8%) and disagree (5.6%).

Actively Caring Behaviours

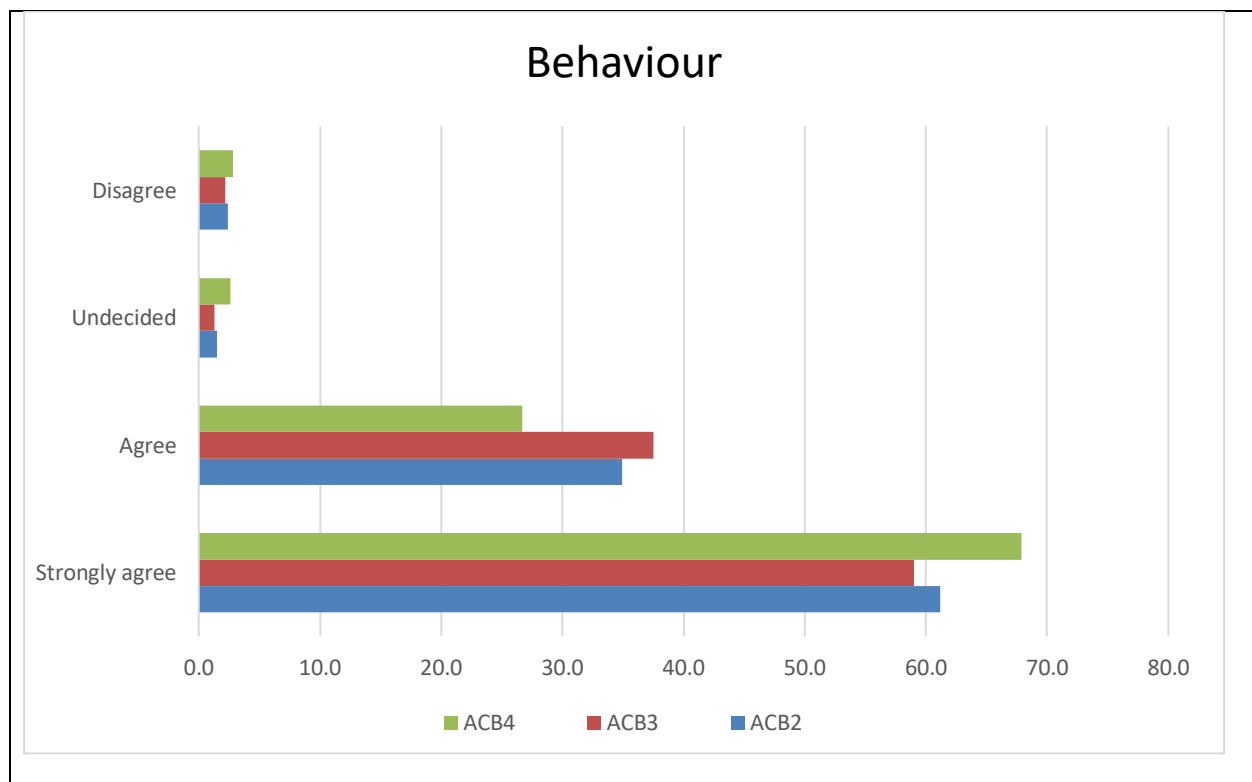


Figure 0-9: Actively Caring Behaviours Frequency Scale

This sub-part asked four questions, from which the first question has been excluded due to the results of the reliability test. Question 2 (ACB2) took the statement “I see myself as someone who

cautions my co-workers if they are doing something risky”. The answers were strongly agree (61.2%), agree (34.9%), and disagree (2.4%). Question 3 (ACB3) was on the statement “I see myself as someone who gives my co-workers safety-related feedback”. The answers were strongly agree (59%), agree (37.5%), and disagree (2.2%). Finally, question 4 (ACB4) focused on the statement “I see myself as someone who believes that discussing and exchanging ideas with my colleagues about safe working helps to prevent accidents”. The answers were strongly agree (67.9%), agree (26.7%), and disagree (2.8%).

Attitude

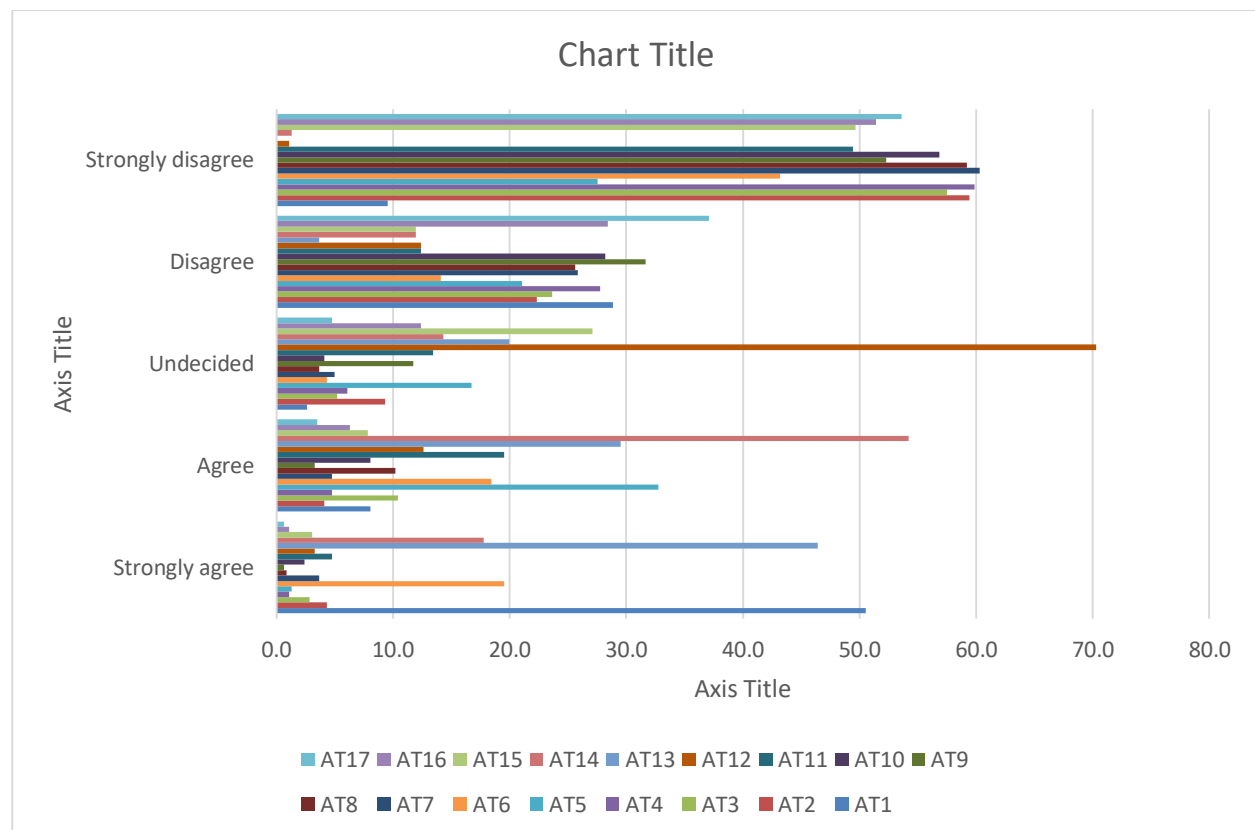


Figure 0-10: Attitude Frequency Scale

The survey included seventeen questions to evaluate attitude. The first statement (AT1) was “I see myself as someone who finds compliance with safety rules at work time-consuming”. The answers were strongly agree (50.5%), and strongly disagree (9.5%). The second statement (AT2), “Brave and strong men never use personal protective equipment (like helmets, safety gloves and

...) while working”, to which the response was strongly agree(4.3%) and strongly disagree (59.4%). Statement 3 (AT3) was “Sometimes conditions such as heat or harassment have resulted from safety rules”, with the responses strongly agree (2.8%) and strongly disagree (57.5%). The results of asking about statement 4 (AT4) “I see equipment (like helmets, safety gloves and ...) hamper me from working safely” were strongly agree (1.1%), and strongly disagree (59.9%). Statement 5 (AT5) was “I see myself as someone who sometimes finds it necessary to disobey the safety rules at work to increase the production rate”, to which the workers responded with strongly agree (1.3%), and strongly disagree (27.5%). The answers corresponding to statement 6 (AT6), “In my opinion, work accidents to individuals depend on chance” were strongly agree (19.5%), and strongly disagree (43.2%). Statement 7 (AT7), “Safe working results in slow progress for the jobs”, got the answers strongly agree (3.7%) and strongly disagree (60.3%). Statement 8 (AT8) was “I think work accidents are the result of fate” to which the answers were strongly agree (0.9%) and strongly disagree (59.2%). The answers to statement 9 (AT9), “I tend to be disorganized in doing my work” were strongly agree (0.7%), and strongly disagree (52.3%). Statement 10 (AT10) was “I tend to worry about my work”; in answer, it got strongly agree (2.4%) and strongly disagree (56.8%). Statement 11 (AT11) was “I tend to be easy-going in my job”. The answers were strongly agree (4.8%), and strongly disagree (49.5%). Statement 12 (AT12) was "I tend to remain calm in risky and tense situations at my work-place". The answers to it were strongly agree (3.3%), and strongly disagree (1.1%) Statement 13 (AT13) was “Before doing my work, I tend to make plans and follow through with them”. The answers to this were in strong agreement (46.4%). Statement 14 (AT14) was “I only enjoy work that is routine”. To this, the answers were strongly agree (17.8%) and strongly disagree (1.3%). Regarding statement 15 (AT15), “Sometimes in my work-place I tend to be temperamental”, the answers were strongly agree (3%), and strongly disagree (49.7%). Statement 16 (AT16) was “I tend to be nervous about my work”. It got the responses strongly agree (1.1%), and strongly disagree (51.4%). Finally, statement 17 (AT17) was “I tend to argue a lot with my co-workers” with the responses strongly agree (0.7%), and strongly disagree (53.6%).

Descriptive analysis of H&S Implementation and Practices in Construction Sites

Abu Dhabi Occupational Safety and Health Center (OSHAD) was established with a vision of providing safe and healthy work-places for all in Abu Dhabi. Its responsibilities include developing and updating OSHAD SF, and ensuring that relevant parties in the Emirate follow up

the implementation of the system. One of the center's main responsibilities is to develop an integrated OSH management system, to build safe and healthy work-places and keep pace with the strategic plan of the government of Abu Dhabi. Like most international management systems, its main structure consists of mandatory and non- mandatory documents, including a: glossary of terms, manual, elements, standards and guideline, Codes of Practice, mechanisms, standard forms, technical guidelines, and guidance documents.

The codes of practice (CoPs) are mandatory technical documents. As of 2018, OSHAD SF has 54 codes of practice presenting safe and healthy practices for workers in different sectors in the performance of their jobs including codes of practice related to Personal Protective Equipment, First Aid and Medical Treatment, and Safety in the Heat.

In the construction industry, standard procedures are necessary to ensure that a designed process can work as effectively as possible. Therefore, section three of the survey contained 15 questions that revealed whether the respondents were aware of these procedures. The rationale behind this section was to examine whether construction companies are implementing the standards as required by OSHAD-SF.

As mentioned above, this section covers standards in three areas included in OSHAD SF. Five questions for each area were based on its standard requirements.

PPE

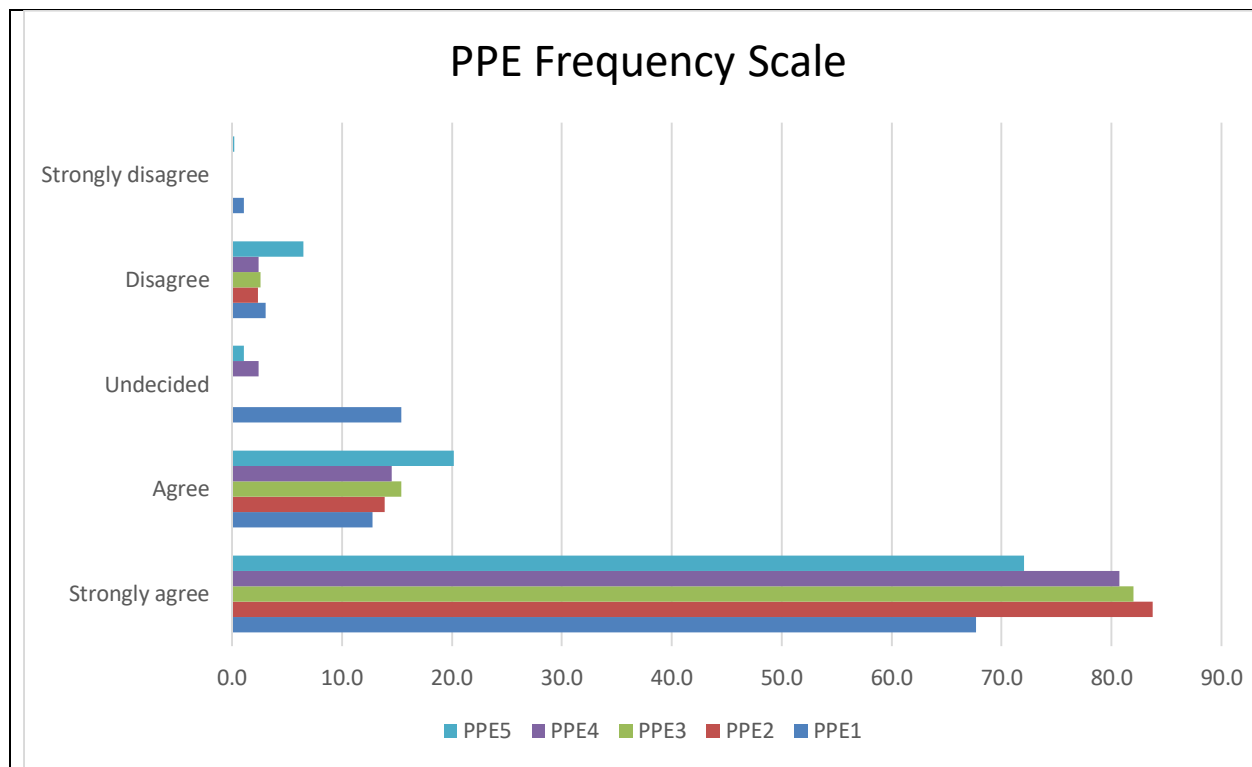


Figure 0-11: PPE Frequency Scale

The figure presents the descriptive statistics about personal protective equipment which mainly show the 5 variables measuring the knowledge of workers about PPE standard requirements and also present the level of knowledge among construction companies of the PPE standards and requirements.

Question 1 (PPE1) concerned the statement “I have my own PPE”. The above chart shows that 67.7% of respondents strongly agreed and 1.1% strongly disagreed. The results of question 2 (PPE2) on the statement “I use appropriate PPE every time I go to the site or perform a job”, were strongly agree (83.7%) and disagree (2.4%). Question 3 (PPE3) about the statement “I received proper training on how to use PPE, where to store it, and how to clean it” showed strongly agree (82%) and disagree (2.6%). Question 4 (PPE4) about the statement “My employer/responsible person conducts appropriate inspections for all PPE” got the following results: strongly agree (80.7%) and disagree (2.4%). Finally, the results of question 5 (PPE5) on the statement “I did not pay for my PPE, and the company was responsible for all the costs” were strongly agree (72%) and strongly disagree (.2%).

Overall, this finding indicates that there is a high level of awareness among workers of the PPE requirements and of companies' implementation of its standards and requirements.

First Aid

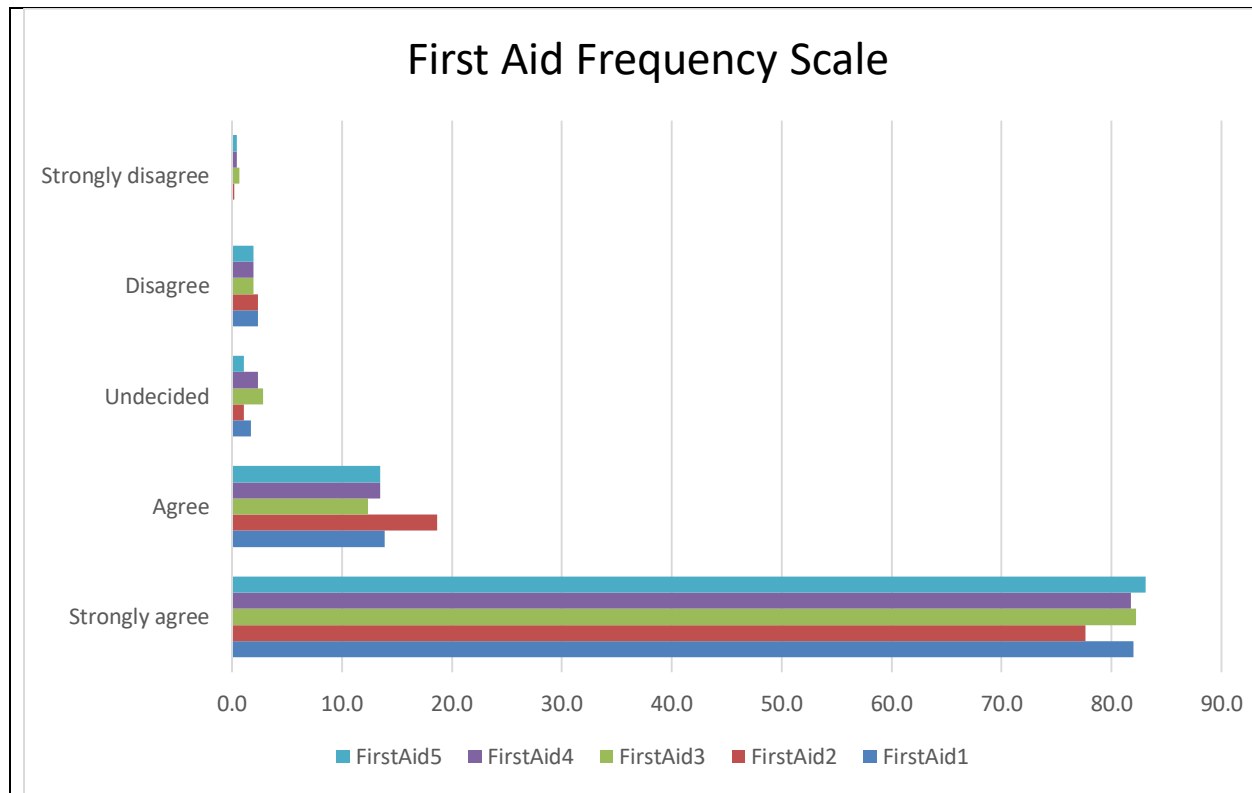


Figure 0-12: First Aid Frequency Scale

The above chart presents the descriptive statistics of the first aid provision, which is reflected by 5 variables measuring the knowledge among workers of the standard requirements for first aid and also presents the level of understanding and implementing of the first aid standards and requirements among construction companies.

Question 1 (FirstAid1) has the statement “First aid facilitates and boxes are available on site and identified by a first aid sign”. The above chart shows strongly agree (82%) and disagree (2.4%). The results of question 2 (FirstAid2) on the statement “First aid boxes at the worksites include all the important and basic contents and are cleaned and monitored regularly” had strongly agree (77.7%) and strongly disagree (0.2%) from its respondents. Question 3 (FirstAid3) took the statement “First aiders and on-site medical providers’ details and contact numbers are posted in clear locations, where the first box is, and throughout the worksite”. The results from respondents show strongly agree from (82.2%) and strongly disagree from (0.7%). Question 4 (FirstAid4)

concerned the statement, “I receive proper information from my employer/supervisor regarding first aid in clear language”. The results show strongly agree (81.8%) and strongly disagree (0.4%). Finally, the results of question 5 (FirstAid 5) bearing the statement “I know when, how, and where to receive first aid or medical emergency treatment” show strongly agree (83.1%) and strongly disagree (0.4%).

Overall, this finding indicates that there is a high level of awareness among workers of the PPE requirements and companies' implementation of their standards and requirements.

Safety in the Heat

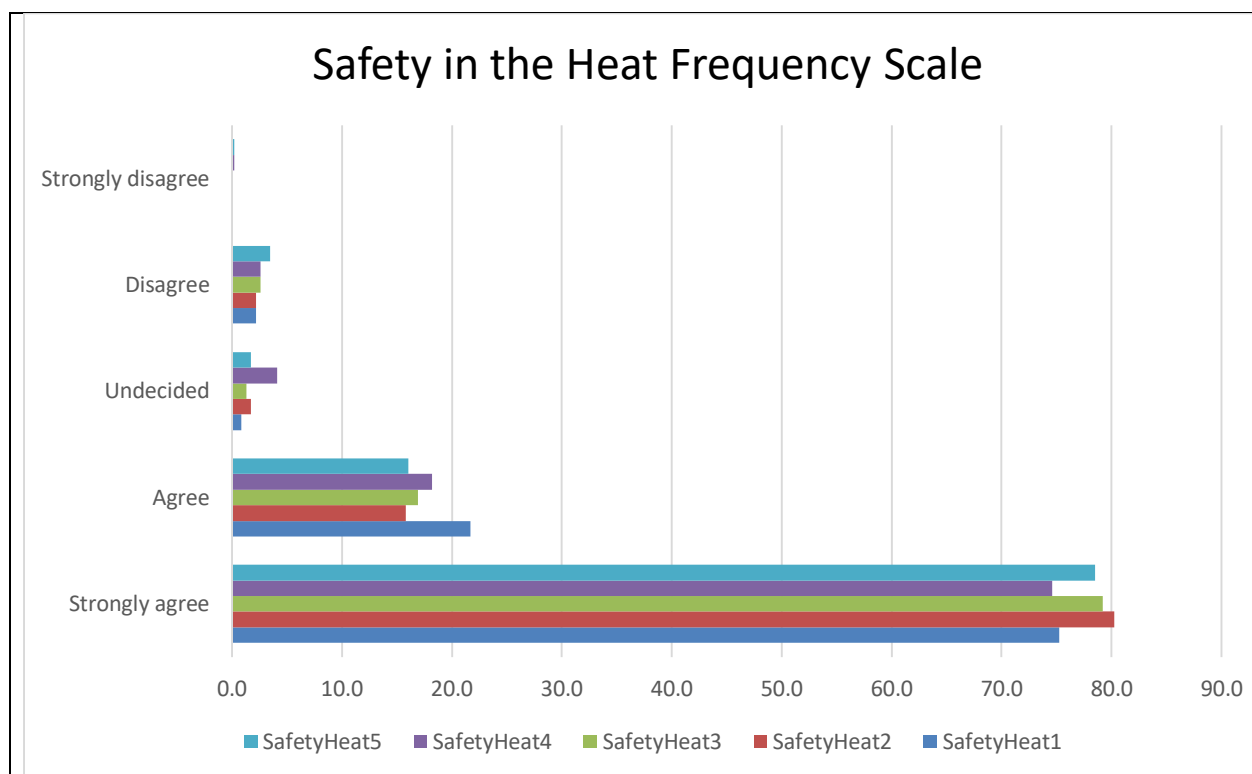


Figure 0-13: Safety in the Heat Frequency Scale

The above figure presents the descriptive statistics of provisions for safety in the heat which is reflected by 5 variables measuring the knowledge of workers of the standard requirements and also presents the level of construction companies' understanding and implementing of the standards and requirements for such provisions.

Question 1 (SafetyHeat1) has the statement “I was made fully aware of working in the heat during the summer months and the company has informed me about the signs of over-heating”. The chart shows strongly agree (75.3%) and disagree (2.2%) with the statement. The results of question 2

(SafetyHeat2) concern the statement “The company has informed me about the importance of keeping myself well by hydrating and eating well in the summer, and they are supplying the appropriate food, and appropriate quantity of fluids (such as potable water)” indicates strongly agree (80.3%) and disagree (2.2%). Question 3 (SafetyHeat3) is attached to the statement “The company is offering shade and cooling shelters for workers working outside during the summer months”. The results were strongly agree (79.2%) and disagree (2.6%). Question 4 (SafetyHeat4) covers the statement “I do not work outdoors in the middle of the day during the period 15 June to 15 September”. The results show strongly agree (74.6%) and strongly disagree (0.2%). Finally, the results of question 5 (SafetyHeat5) concerning the statement “I have been provided with appropriate clothing (e.g. lightweight, cotton, light-colored) to use during summer” shows strongly agree (78.5%) and strongly disagree (0.2%).

Overall, this finding indicates that a high number of workers are aware of the requirements for safety in the heat and that companies' implement many of its standards and requirements.

Descriptive analysis of general information of participants

Gender

The data breakdown for respondents' gender is shown below.

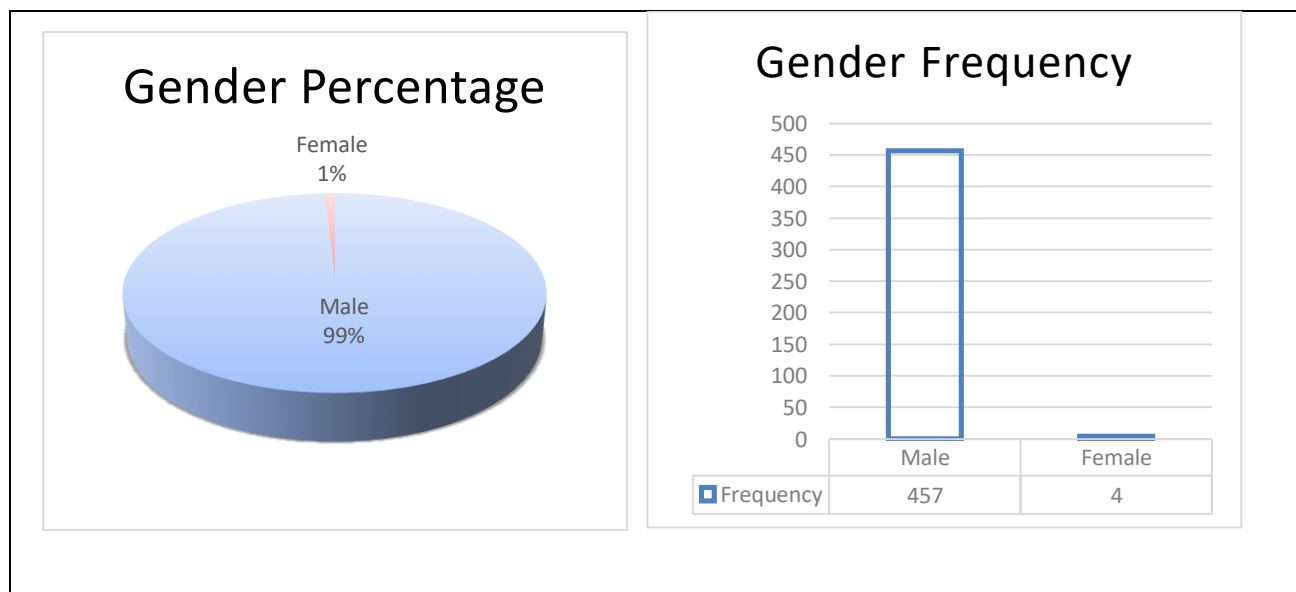


Figure 0-14: Breakdown of gender in the research sample

The findings showed the respondents' gender description as follows: 457 respondents (99%) were male and 4 respondents (1%) were female. This big difference is understandable since the most workers in this industry are males.

Education

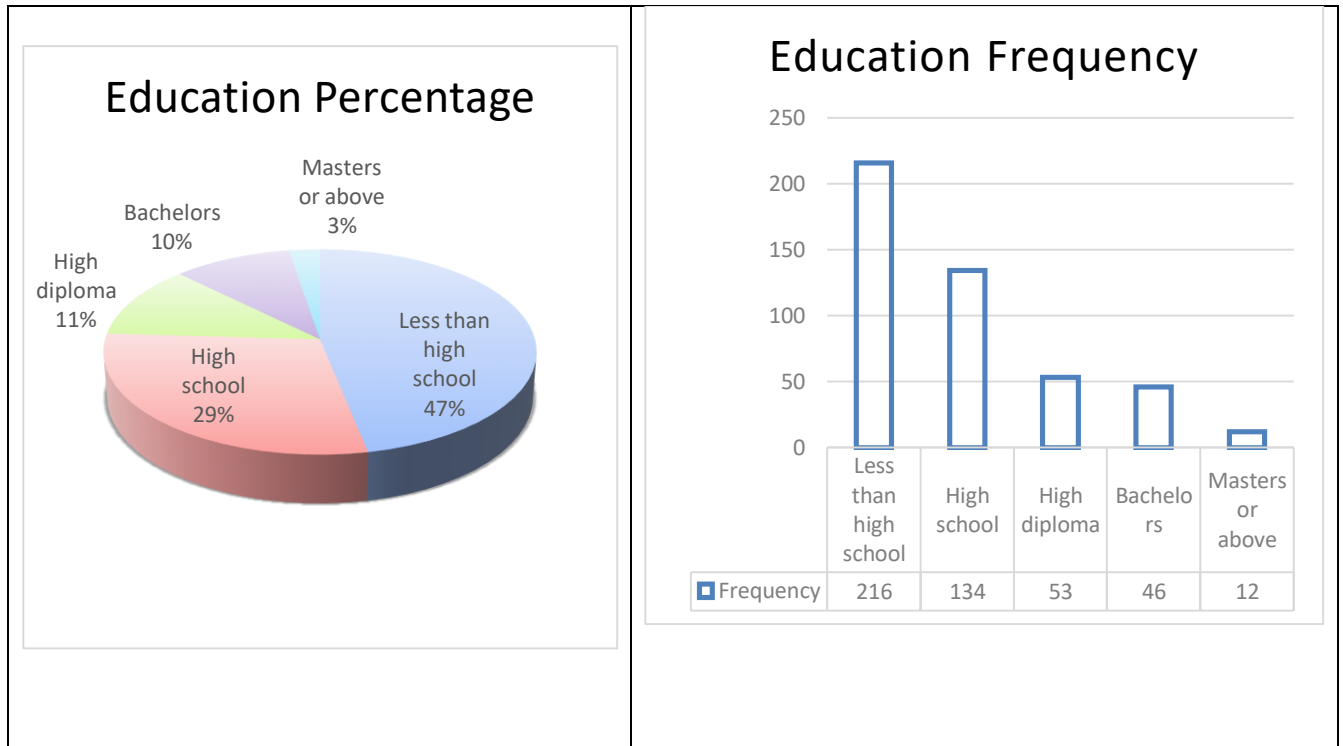


Figure 0-15: Breakdown of Education Background in the Research Sample

The findings showed the respondents had attained the following educational standards: 216 respondents (47%) did not complete high school, 134 respondents (29%) had completed high school, 53 respondents (11%) had a high school diploma, 46 respondents (10%) had a bachelor's degree and 12 of the respondents (3%) had a master's degree or above.

Construction Site types

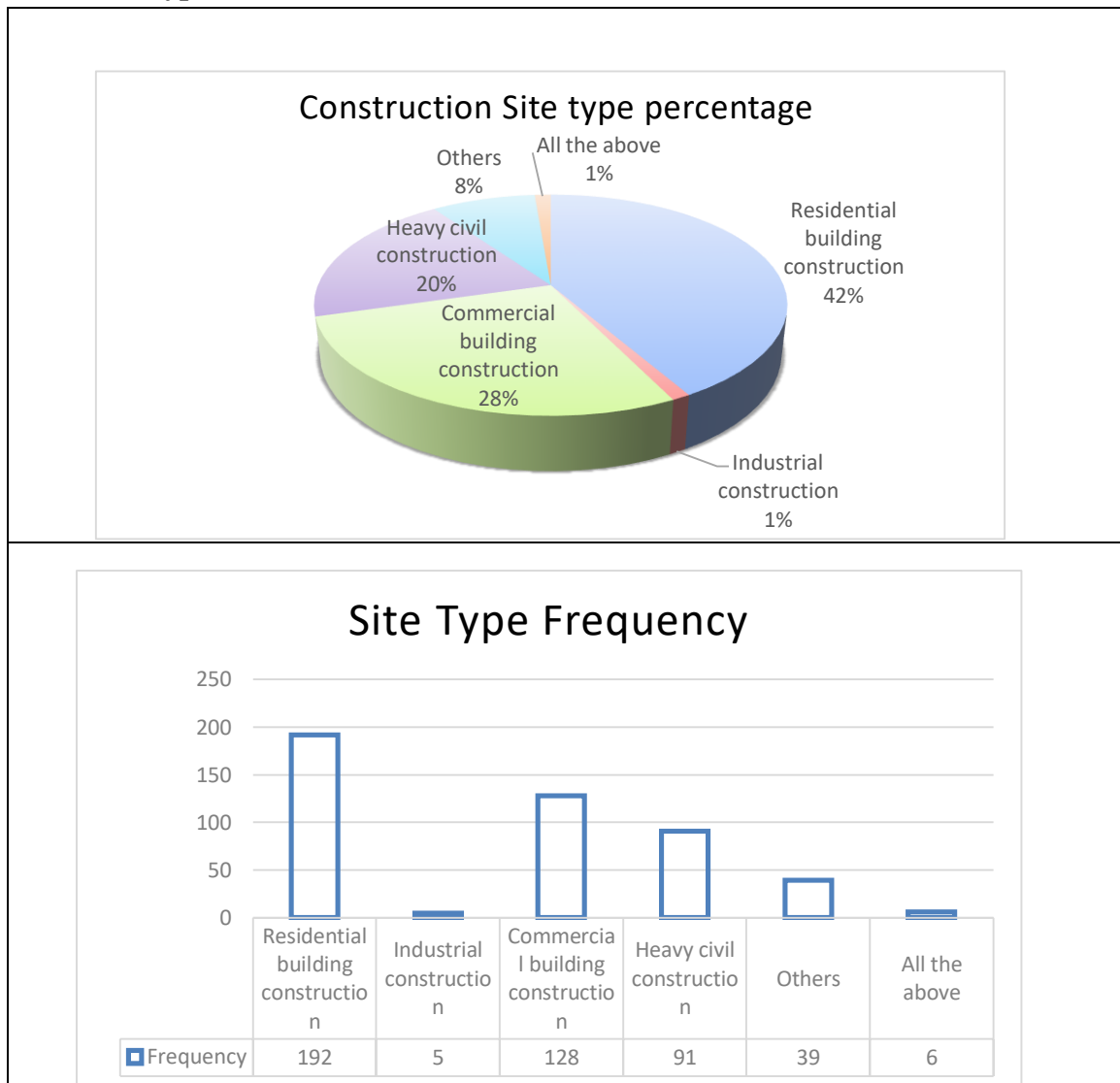


Figure 0-16: Breakdown of the Construction Sites in the Research Sample by Type

The findings showed the types of construction site represented in the sample as follows: 192 respondents (42%) were working on Residential buildings, 128 respondents (28%) were in Commercial building construction, 91 respondents (20%) were engaged in heavy civil construction, 39 respondents (8%) were working on other things, 6 of the respondents (1%) were working on all the above types of construction site, and 5 of them (1%) were working on industrial construction sites.

Experience

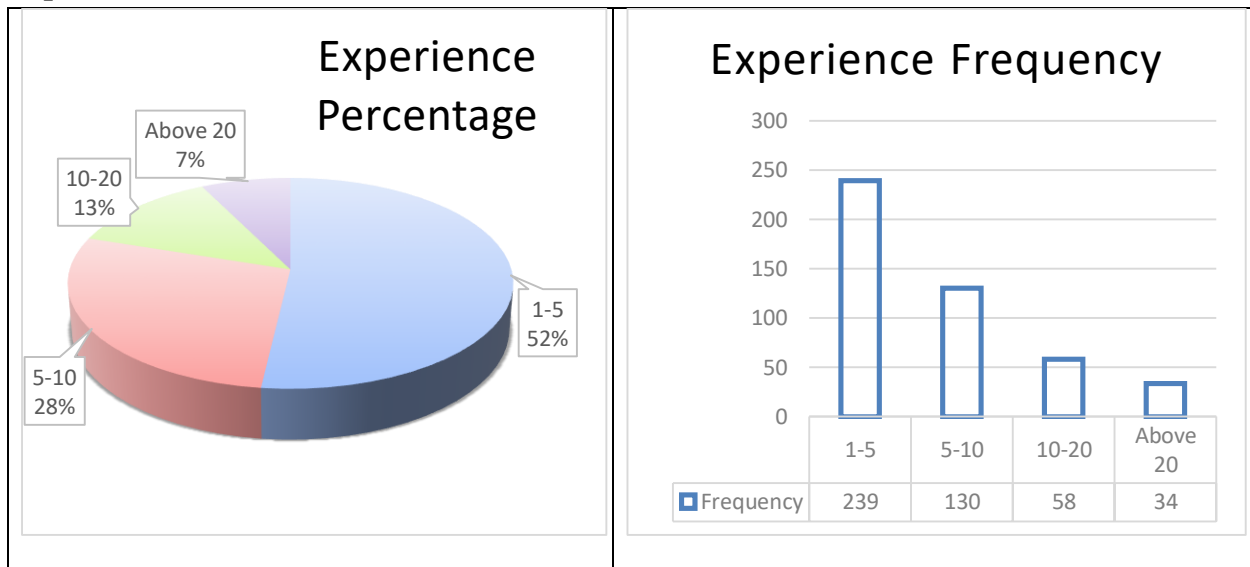


Figure 0-17: Breakdown of Research Sample on the basis of Workers' Years of Experience

The findings showed the respondents experience as follows: (52%) have from 1-5 years of experiences, (28%) have from 5 to 10 years of working experience, (13%) of respondents have from 10 to 20 years of experience, and finally (7%) have above 20 years of experience.

Job position

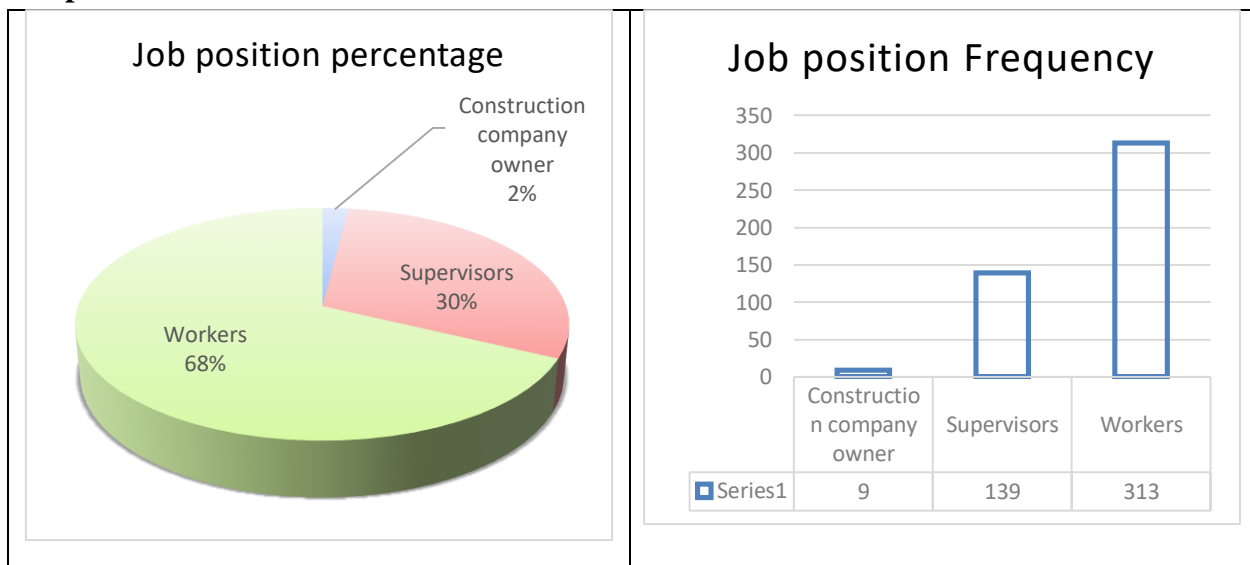


Figure 0-18: Research Sample Job Position Breakdown

The findings showed the respondents' job position as follows: 313 respondents (68%) were workers, 139 respondents (30%) were supervisors, and 9 respondents (2%) were construction company owners.

Reliability tests

Among the techniques for testing reliability, Cronbach's Alpha is the most popular. Reliability is calculated on a rate of 0-1 with 0 refers to no reliability and 1 refers to perfect reliability. A value greater than 0.9 is considered perfect, while a value in between 0.75 and 0.9 is considered good however lower than 0.75 is a very poor Reliability. Akgül & Çevik, (2005) also claimed that a value of 0.7 and more defines a good reliability of the scale.

These are among the most important tests for analyzing the degree to which a test consistently measures whatever it measures. Errors of measurement that affect reliability are random errors, while errors of measurement that affect validity are systematic or constant errors (Gay, 1987).

When the error is low or minimal, researchers expect the scores to be accurate (Meadows & Billington, 2005). For the reliability of the questionnaire scale, Cronbach Alpha is computed and the elements with a Cronbach Alpha of more than 0.60 are considered reliable. (Gliem & Gliem, 2003) define the following range of Cronbach's alpha coefficient:

Alpha coefficient range	Strength of Association
< 0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very good
0.9	Excellent

Table 0-1: Coefficient Alpha

In the present study, first, the reliability test (Cronbach alpha test) was run to examine the correlations and the internal consistency between the questions of the questionnaire; since the questions were been divided into 14 groups, the reliability (Cronbach alpha test) was calculated for 14 groups also. The scale which was used to measure the reliability test of the first group (Part 1 performance- Affective commitment) consisting of 5 questions was consistent ($\alpha=0.72$). The scale which was used to measure the reliability test of the second group (Part 1 performance- Continuance commitment) consisting of 8 questions was consistent ($r=0.79$). The scale which was used to measure the reliability test of the third group (Part 1- Normative Commitment) consisting of 6 questions was moderately consistent ($r=0.67$). The scale which was used to measure the

reliability test of the fourth group (part 1- Performance- Organizational commitment) consisting of 4 questions was outstandingly consistent ($r=0.91$). The scale which was used to measure the reliability test of the fifth group (Part 1- Performance- Absenteeism) consisting of 5 questions was consistent ($r=0.78$). The scale which was used to measure the reliability test of the sixth group (Part 1- Performance- Work Alienation) that is consisting of 8 questions was outstandingly consistent ($r=0.95$). The scale which was used to measure the reliability test of the seventh group (Part 1- Performance- Job Performance) consisting of 4 questions was very consistent ($r=0.83$). The scale which was used to measure the reliability of the eighth group (Part 2- Workers Personal Traits- Self efficacy) consisting of 11 questions was very consistent ($r=0.86$). The scale which was used to measure the reliability test of the ninth group (Part 2- Workers Personal Traits- Outcome Expectancy/Self-Awareness) consisting of 4 questions was very consistent ($r=0.7$). The scale which was used to measure the reliability test of the tenth group (Part 2- Workers Personal Traits- Actively Caring Behaviours) consisting of 3 questions was outstandingly consistent ($r=0.93$). The scale which was used to measure the reliability test of the eleventh group (Part 2- Workers Personal Traits- Attitude) consisting of 17 questions was consistent ($r=0.7$). The scale which was used to measure the reliability test of the twelfth group (Part 3- Implementing H&S in Construction sites- PPE) consisting of 5 questions was very consistent ($r=0.81$). The scale which was used to measure the reliability test of the thirteenth group (Part 3- Implementing H&S in Construction sites- First Aid) consisting of 5 questions was outstandingly consistent ($r=0.95$). The scale which was used to measure the reliability test of the fourteenth group (Part 3- Implementing H&S in Construction sites- Safety in the Heat) consisting of 5 questions was outstandingly consistent ($r=0.90$). The table below summarizes the above paragraph and includes the original number of questions used in conducting the survey plus the reliability ranking from the perfect result to the least reliable.

SN	Group name	Original Number	Number of Questions after	Cronbach's Alpha	Ranking of Reliability
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		of Questions	applying the test		
1	Part 1 performance- Affective Commitment (AC)	8	5	0.717	11
2	Part 1 performance- Continuance Commitment (CC)	8	8	0.791	9
3	Part 1 performance- Normative Commitment (NC)	8	6	0.67	14
4	Part 1 performance- Organizational Commitment (OC)	4	4	0.91	4
5	Part 1 performance- Absenteeism (AB)	5	5	0.777	10
6	Part 1 performance- Work Alienation (WA)	8	8	0.949	2
7	Part 1 performance- Job performance (JP)	5	4	0.834	7
8	Part 2 Workers Personal Traits- Self Efficacy (SE)	11	11	0.86	6
9	Part 2 Workers' Personal Traits- Outcome Expectancy (OE)	6	4	0.7	13
10	Part 2 Workers' Personal Traits- Actively Caring Behaviours (ACB)	5	3	0.931	3
11	Part 2 Workers' Personal Traits- Attitude (AT)	17	17	0.704	12
12	Part 3- Implementing H&S in Construction sites-PPE	5	5	0.811	8
13	Part 3- Implementing H&S in Construction sites- First Aid	5	5	0.953	1
14	Part 3- Implementing H&S in Construction sites- Safety in the Heat	5	5	0.896	5

Table 0-2: Reliability (Cronbach alpha test) for the fourteen groups

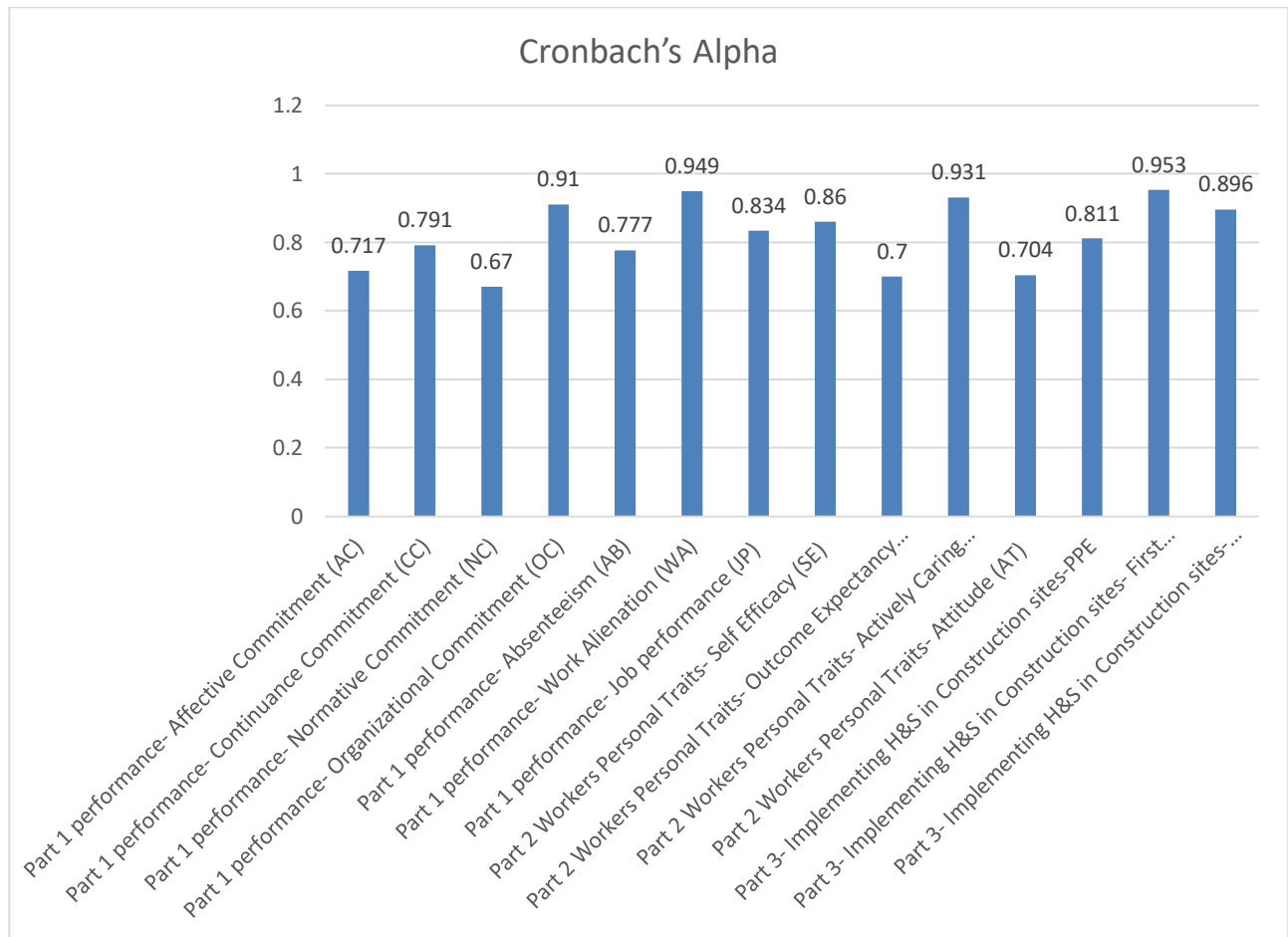


Figure 0-19: Reliability (Cronbach Alpha Test) for the Fourteen Groups

Thus, it was decided that the first, second, third, fourth and fifth groups of the questionnaire were highly reliable and statistical tests could be performed.

Summary

The results demonstrated that, and the design of the survey questionnaires found to be reliable in order to perform the further analysis. It is justified in the light of the different tests that have been performed in this chapter in order to assess the reliability of the questionnaires and the sample size. Thus, all the tests including common method bias, data normality, descriptive statistics, and reliability analysis found appropriate and significant for this study.

CHAPTER SEVEN: RESULTS OF THE HYPOTHESES TESTING

Chapter Overview

This chapter presents the results of the key analysis conducted for the study in order to test the developed hypotheses and the research framework linked to the workers' performance and their personal traits. In order to perform the analysis, several statistical tests were undertaken namely, correlation analysis, regression analysis, and structural modeling using AMOS. The relevant charts are used to illustrate the findings.

The Result for the First Hypothesis

The first hypothesis of the study is:

Hypothesis 1: 'There is an association between OSHAD SF and affective commitment.'

In this hypothesis, the dependent variable is 'Affective Commitment', while the independent variable is OSHAD SF (PPE, first aid, safety in the heat). The variables were tested in the context of the construction sector in Abu Dhabi. The results for this hypothesis were presented by performing the Pearson Coefficient Correlation and a summarized Regression Model is developed to test the hypothesis (without considering the sub-hypothesis).

Table 0-1: Correlation coefficients for Affective Commitment & OSHAD SF

OSHAD SF	Affective Commitment
PPE	.044
First Aid	.097*
Safety in the Heat	.135**

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 7.1, there was a positive relationship between OSHAD SF and Affective Commitment, which means that the score for Affective Commitment increased at the rate that the OSHAD SF was implemented in the construction sector in Abu Dhabi.

To test the developed hypothesis as whole, a multiple regression was performed that revealed the following outcomes:

Table 0-2: Regression Model Summary for Affective Commitment & OSHAD SF

Model Summary	
R-Square	0.028
Adjusted R-Square	0.021
Sum of Squares	5.494
Df	3
F-Value	4.352
Significance Value	0.005
Predictors: Safety in the Heat, PPE, First Aid	
Dependent Variable: Affective Commitment	

Table 0-3: Parameter Estimates of Regression Coefficient

	Estimates	Std. Error	T	Sig.
(Constant)	2.477	.077	32.053	.000
PPE	-.194	.092	-2.120	.035
First Aid	.091	.094	.972	.332
Safety in the Heat	.223	.084	2.663	.008

As shown in Tables 7.2 and 7.3, the three OSHAD SF components explained 2.8% of the variance in the Affective Commitment. This variance proportion is statistically significant because the F-Value is 4.352, degree of freedom is 3 and p-value is 0.005. Besides, the results in Table 7.3 indicate that both PPE and Safety in the Heat contributed significantly in predicting Affective Commitment, whereas First Aid failed to contribute in this regard, which opposes the theories that indicates a significant correlation between implementing an OSH management system and affective commitment (Amponsah-Tawiah & Mensah, 2016) .

There are reasons behind the result related to first aid although our data indicates that there is a high level of workers awareness of First Aid requirements and companies' implementation of its standards and requirements. The first reason could be lack of workers understanding in the importance of having first aid in the companies. Another explanation could be that workers may think that it is government requirement and the company didn't provide it for their health.

A suggestion to solve this is to inform the workers directly during awareness workshops about the effort and money the company is spending to provide this important requirement for them. By doing this, workers would feel that they were important and affective commitment would increase.

The regression equation is:

$$\text{Affective Commitment} = 2.477 - 0.194 (\text{PPE}) + 0.091 (\text{First Aid}) + 0.223 (\text{Safety in the Heat})$$

The following sections (7.2.1 to 7.2.3) show the results for the sub-hypotheses derived from Hypothesis 1:

Association between Personal Protective Equipment and Affective Commitment

H1.A: 'There is an association between OSHAD SF (personal protective equipment PPE) and affective commitment.'

As shown in Table 7.1, the correlation between PPE and Affective Commitment is positive but very weak with a coefficient value of 0.044. It reflects that the score for affective commitment increases very slightly when the PPE were provided in the Abu Dhabi construction sector. Figure 7.1 shows that the PPE has a weak effect on affective commitment.

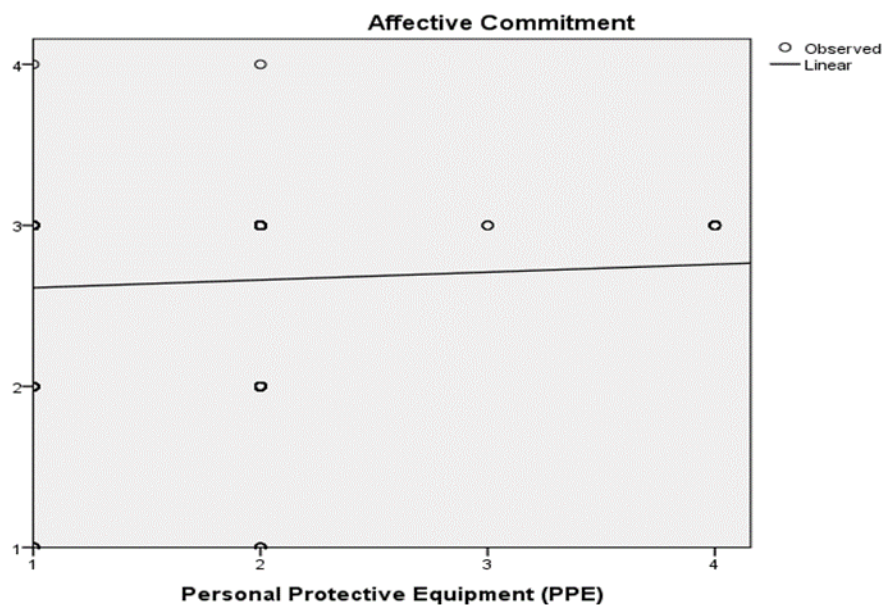


Figure 0-1: Positive relationship between affective commitment and PPE

The regression output for the given hypothesis is shown in Table 7.4, which shows that PPE explained only 0.2% of the variance in the Affective Commitment. This variance proportion is not statistically significant since the F-Value is 0.871, degree of freedom is 1 and p-value is 0.351. Hence, PPE failed to contribute in this regard; therefore, the hypothesis cannot be accepted. Again,

this goes against the theory which claims strong positive correlation between OSH management system and affective commitment.

Model Summary	
R-Square	0.002
Adjusted R-Square	0.000
Sum of Squares	0.375
Df	1
F-Value	0.871
Significance Value	0.351
Predictors: PPE	
Dependent Variable: Affective Commitment	

Table 0-4: Regression Model Summary for Affective Commitment & PPE

Association between First Aid and Affective Commitment

H1.B: 'There is an association between OSHAD SF (first aid) and affective commitment.

As shown in Table 7.1, the correlation between First Aid and Affective Commitment is positive but very weak with a coefficient value of 0.097. It reflects that the score for affective commitment increases very slightly when First Aid is provided in the Abu Dhabi construction sector. Figure 7.2 shows that the First Aid has weak effects on Affective Commitment.

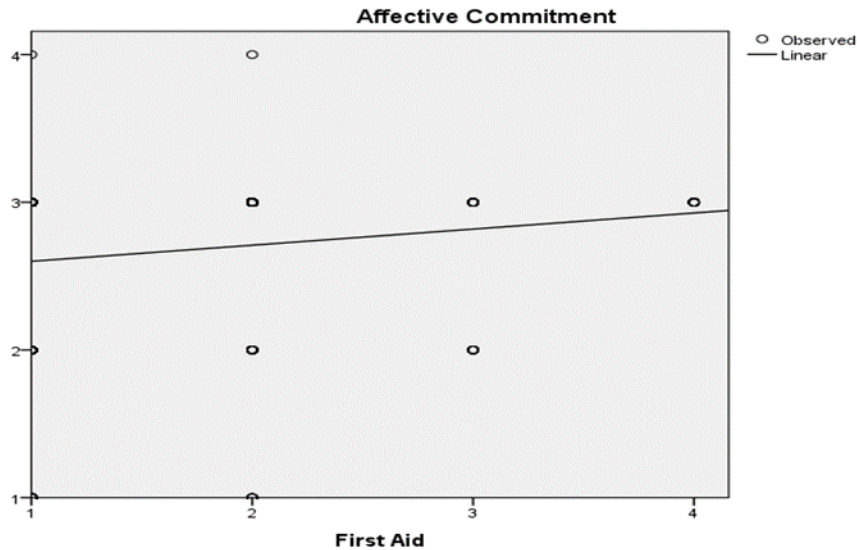


Figure 0-2: Positive relationship between affective commitment and first aid

The regression output for the given hypothesis is shown in Table 7.5, which shows that First Aid explained only 0.9% of the variance in the Affective Commitment. This variance proportion is statistically significant since the F-Value is 4.385, degree of freedom is 1 and p-value is 0.037. Hence, First Aid contributes in this regard; therefore, the hypothesis cannot be rejected. As mentioned in previous chapters there is a close relationship between occupational safety and health and the organizational commitment of employees. The dimensions of organizational commitment and occupational health and safety were different; and there is positive association between employee affective commitment and occupational health and safety. Thus, the perception of employees about health and safety management in an organization impacts on their decision to continue working in the organization and contribute to it with improved performance.

Model Summary	
R-Square	0.009
Adjusted R-Square	0.007
Sum of Squares	1.872
Df	1
F-Value	4.385
Significance Value	0.037
Predictors: First Aid	
Dependent Variable: Affective Commitment	

Table 0-5: Regression Model Summary for Affective Commitment & First Aid

Association between Safety in the Heat and Affective Commitment

H1.C: 'There is an association between OSHAD SF (Safety in the Heat) and affective commitment.'

As shown in Table 7.1, the correlation between safety in the heat and affective commitment is positive but very weak with a coefficient value of 0.135. It reflects that the score for affective commitment increases slightly when safety in the heat is provided in the Abu Dhabi construction sector. Figure 7.3 shows that the provision of safety in the heat has a weak effects on affective commitment, which, as mentioned before does not reflect the theory or previous studies which indicate a close correlation between the OSH management system and affective commitment.

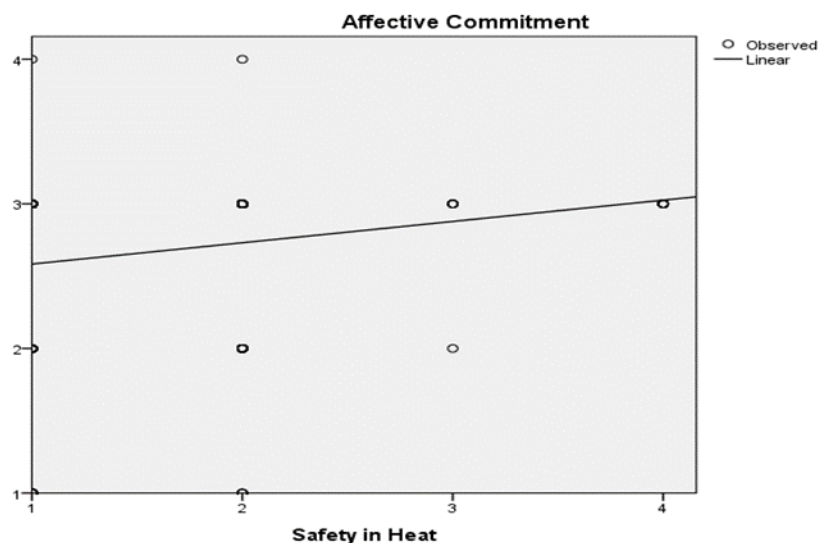


Figure 0-3: Positive relationship between affective commitment and safety in the heat

The regression output is shown in Table 7.6, which shows that safety in the heat explained only 1.8% of the variance in affective commitment. This variance proportion is statistically significant since the F-value is 8.481, degree of freedom is 1 and p-value is 0.004. Hence, safety in the heat contributes in this regard; therefore, the hypothesis cannot be rejected. This result is supported by studies which indicate a close correlation between the effective strategies for OSH management and improved employee commitment and performance. The OSH management initiatives by management that allow the involvement of employees in the system development can allow

employees to provide their own ideas about important organizational affairs. This results in an increased sense of commitment and belonging among employees (Akpan, 2011).

Model Summary	
R-Square	0.018
Adjusted R-Square	0.016
Sum of Squares	3.589
Df	1
F-Value	8.481
Significance Value	0.004

Predictors: Safety in the Heat

Table 0-6: Regression Model Summary for Affective Commitment & Safety in the Heat

Dependent Variable: Affective Commitment

The Result for the Second Hypothesis

The second hypothesis of the study is:

Hypothesis 2: 'There is an association between OSHAD SF and absenteeism.'

In this hypothesis, the dependent variable is 'Absenteeism', while the independent variable is OSHAD SF (PPE, first aid, safety in the heat). The variables were tested in the context of the construction sector in Abu Dhabi. The results for this hypothesis were presented by performing the Pearson Coefficient Correlation and a summarized Regression Model was developed to test the hypothesis (without considering the sub-hypotheses).

OSHAD SF	Absenteeism
PPE	-0.570**
First Aid	-0.511**
Safety in the Heat	-0.516**

Table 0-7: Correlation coefficients for Absenteeism & OSHAD SF

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 7.7, there was a moderately negative relationship between OSHAD SF and Absenteeism, which means that the score for Absenteeism decreases when the OSHAD SF implemented in the construction sector in Abu Dhabi. This result confirms the findings from other studies which indicate that when implementing a safe working environment by using an effective occupational health and safety management system may reduce employees' absenteeism and may lead to increased productivity and profitability for the organization (Dwomoh, Owusu, & Addo, 2013)

To test the developed hypothesis as a whole, a multiple regression was performed that revealed the following outcomes:

Model Summary	
R-Square	0.344
Adjusted R-Square	0.340
Sum of Squares	94.166
Df	3
F-Value	79.887
Significance Value	0.000

Table 0-8: Regression Model Summary for Absenteeism & OSHAD SF

Predictors: Safety in the Heat, PPE, First Aid

Dependent Variable: Absenteeism

	Estimates	Std. Error	T	Sig.
(Constant)	5.497	0.075	73.636	0.000
PPE	-0.495	0.089	-5.595	0.000
First Aid	-0.102	0.091	-1.116	0.265
Safety in the Heat	-0.222	0.081	-2.747	0.006

Table 0-9: Parameter Estimates of Regression Coefficient

As shown in Tables 7.8 and 7.9, the three OSHAD SF components explained 34.4% of the variance in absenteeism. This variance proportion is statistically significant because the F-value is 79.887, degree of freedom is 3 and p-value is 0.000. Besides, the results in Table 7.9 indicate that both PPE and Safety in the Heat contributed significantly in predicting absenteeism, whereas First Aid failed to contribute in this regard. This contradicts the theories and previous studies which show

that occupational health and safety should have a close correlation with absenteeism, and should help in reducing it, since one of the objectives of the system is to identify health risks. The OSH systems also have the potential to improve workers' psychological wellbeing or stress levels, and this positive development may, in turn, lead to a significant drop in absenteeism (Hickman, 2014).

The regression equation is:

$$\text{Absenteeism} = 5.497 - 0.495 (\text{PPE}) - 0.102 (\text{First Aid}) - 0.222 (\text{Safety in the Heat})$$

The following sections (7.3.1 to 7.3.3) show the results for the sub-hypotheses derived from Hypothesis 2:

Association between Personal Protective Equipment and Absenteeism

H2.A: 'There is an association between OSHAD SF (PPE) and absenteeism.'

Table 7.7 shows that the correlation between PPE and absenteeism is moderately weak with a coefficient value of -0.570. It reflects that the score for Absenteeism decreased moderately when PPE were provided in the Abu Dhabi construction sector. Figure 7.4 shows that the PPE has moderately negative effects on absenteeism. As mentioned in previous chapters, studies show the absenteeism. This means that when PPE increases absenteeism will decline, showing a negative relationship (Dwomoh, Owusu, & Addo, 2013).

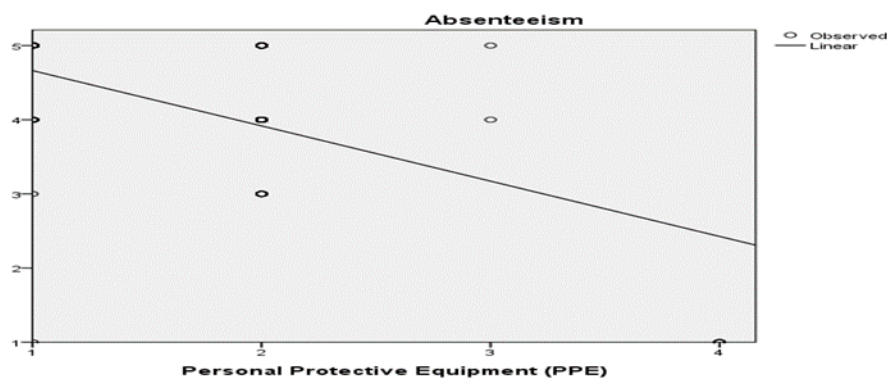


Figure 0-4: Negative relationship between Absenteeism and PPE

The regression output for this hypothesis is shown in Table 7.10, which shows that PPE explained only 32.5% of the variance in absenteeism. This variance proportion is statistically significant

because the F-Value is 220.573, degree of freedom is 1 and p-value is 0.000. Hence, PPE contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.325
Adjusted R-Square	0.323
Sum of Squares	88.845
Df	1
F-Value	220.573
Significance Value	0.000

Table 0-10: Regression Model Summary for Absenteeism & PPE
Predictors: PPE
Dependent Variable: Absenteeism

Association between First Aid and Absenteeism

H2.B: 'There is an association between OSHAD SF (first aid) and absenteeism.'

Table 7.7 shows that the correlation between first aid and absenteeism is moderately weak with a coefficient value of -0.511. It reflects that the score for Absenteeism decreases moderately when first aid is provided in the Abu Dhabi construction sector. Figure 7.5 shows that first aid has moderately negative effects on absenteeism. This result supports previous studies in this matter which suggest that occupational health and safety should help to reduce absenteeism since one of the objectives of the system is to identify health risks. The OSH system also has the potential to improve workers' psychological wellbeing, and this positive development may, in turn, lead to a significant drop in absenteeism (Hickman, 2014).

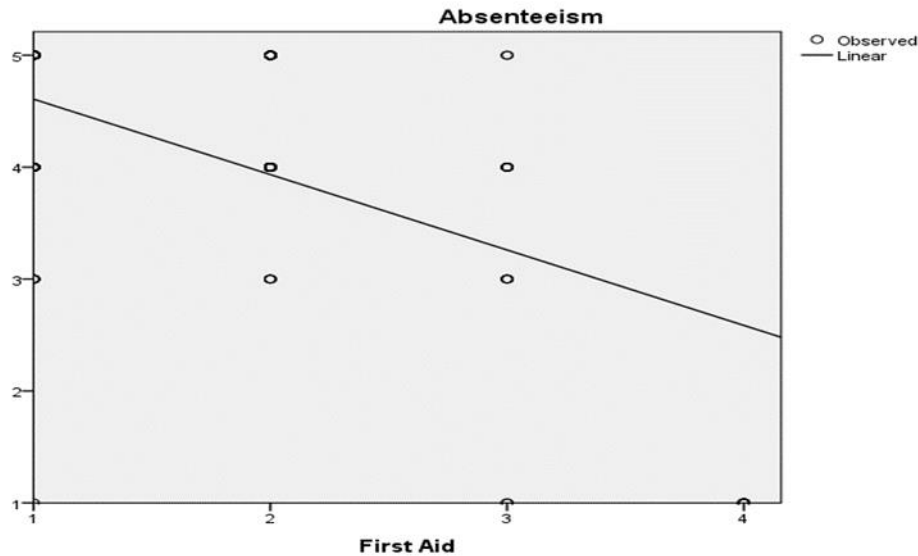


Figure 0-5: Negative relationship between absenteeism and first aid

The regression output for the given hypothesis is shown in Table 7.11, which shows that first aid explained 36.1% of the variance in absenteeism. This variance proportion is statistically significant because the F-Value is 162.088, degree of freedom is 1 and p-value is 0.000. Hence, first aid contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.261
Adjusted R-Square	0.259
Sum of Squares	71.436
Df	1
F-Value	162.088
Significance Value	0.000

Table 0-11: Regression Model Summary for Absenteeism & First Aid

Predictors: First Aid

Dependent Variable: Absenteeism

Association between Safety in the Heat and Absenteeism

H2.C: 'There is an association between OSHAD SF (Safety in the Heat) and absenteeism.'

Table 7.7 shows that the correlation between safety in the heat and absenteeism is moderately weak with a coefficient value of -0.516. It reflects that the score for absenteeism decreases moderately

as safety in the heat is provided in the Abu Dhabi construction sector. Figure 7.6 shows that first aid has moderately negative effects on absenteeism. This result is supported by studies, as noted above.

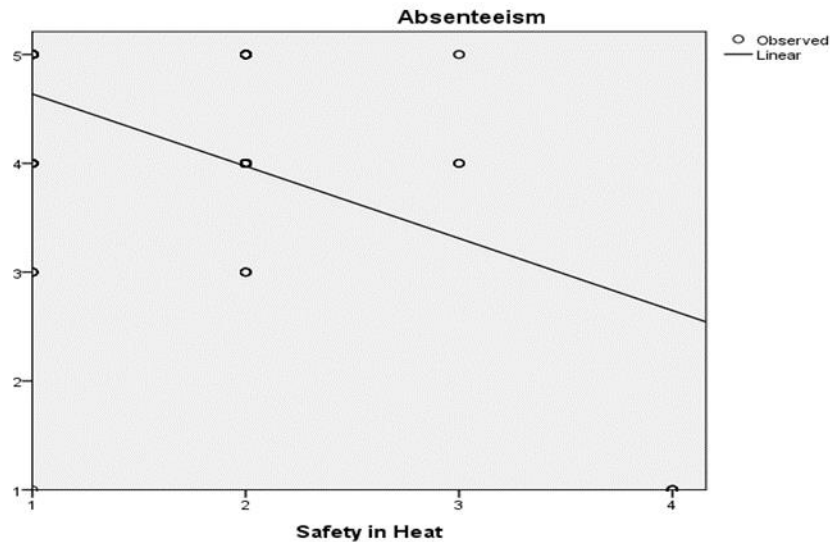


Figure 0-6: Negative relationship between absenteeism and safety in the heat

The regression output for the hypothesis is shown in Table 7.12, which shows that safety in the heat explains 36.1% of the variance in absenteeism. This variance proportion is statistically significant because the F-Value is 162.088, degree of freedom is 1 and p-value is 0.000. Hence, safety in the heat contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Table 0-12: Regression Model Summary for Absenteeism & Safety in the Heat

Model Summary	
R-Square	0.266
Adjusted R-Square	0.264
Sum of Squares	72.781
Df	1
F-Value	166.246
Significance Value	0.000
Predictors: Safety in the Heat	
Dependent Variable: Absenteeism	

The Result for the Third Hypothesis

The third hypothesis of the study is:

Hypothesis 3: 'There is an association between OSHAD SF and work alienation.'

In this hypothesis, the dependent variable is 'Work Alienation', while the independent variable is OSHAD SF (PPE, first aid, safety in the heat). The variables were tested in the context of the construction sector in Abu Dhabi. The results for this hypothesis were presented by performing the Pearson Coefficient Correlation and a summarized Regression Model was developed to test the hypothesis (without considering the sub-hypotheses).

OSHAD SF	Work Alienation
PPE	-0.564**
First Aid	-0.503**
Safety in the Heat	-0.460**

Table 0-13: Correlation coefficients for Work Alienation & OSHAD SF

** . Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 7.13, there was a moderately negative relationship between OSHAD SF and Work Alienation, which means that the score for Work Alienation decreases when OSHAD SF is implemented in the construction sector in Abu Dhabi.

This is supported by the literature which shows that health and safety producers in organizations can add value and solve the issue of weakness through work alienation experienced by representatives. Studies have suggested that human resources strategies and policies should focus on health and safety, communication, teamwork, involvement, participation, cooperation, developing safe working environment, and giving more chances for employees to share in the decision-making process. This practice can decrease the percentage of employee absenteeism and turnover. But when a company does not give the employees the chance to participate in decision-making or does not support its employees effectively, it reduces the employees' loyalty and reliability and increase work alienation (Sulu, Ceylan, & Kaynak, 2010).

To test this relationship in the developed hypothesis as a whole, a multiple regression was performed that revealed the following outcomes:

Model Summary	
R-Square	0.326
Adjusted R-Square	0.322
Sum of Squares	109.215
Df	3
F-Value	73.760
Significance Value	0.000

Table 0-14: Regression Model Summary for Work Alienation & OSHAD SF

Predictors: Safety in the Heat, PPE, First Aid

Dependent Variable: Work Alienation

	Estimates	Std. Error	T	Sig.
(Constant)	5.462	0.084	65.282	0.000
PPE	-0.629	0.099	-6.339	0.000
First Aid	-0.190	0.102	-1.864	0.063
Safety in the Heat	-0.048	0.091	-0.530	0.596

Table 0-15: Parameter Estimates of Regression Coefficient

As shown in Tables 7.14 and 7.15, the three OSHAD SF components explained 32.6% of the variance in Work Alienation. This variance proportion is statistically significant because the F-Value is 73.760, degree of freedom is 3 and p-value is 0.000. Besides, the results in Table 7.15 indicate that PPE and first aid contributed significantly to predicting work alienation, while safety in the heat failed to contribute in this regard. All the predictors were negatively associated with work alienation. This suggests that alienated workers may have a negative view of OSH. These results were in line with the existing literature. The regression equation is:

$$\text{Work Alienation} = 5.46 - 0.629 (\text{PPE}) - 0.190 (\text{First Aid}) - 0.048 (\text{Safety in the Heat})$$

The following sections (7.4.1 to 7.4.3) show the results for the sub-hypotheses derived from Hypothesis 3:

Association between Personal Protective Equipment and Work Alienation

H3.A: 'There is an association between OSHAD SF (PPE) and work alienation.

Table 7.13 shows that the correlation between PPE and work alienation is moderately weak with a coefficient value of -0.564. It reflects that the score for work alienation decreases moderately the PPE was provided in the Abu Dhabi construction sector. Figure 7.4 shows that the PPE has moderately negative effects on work alienation.

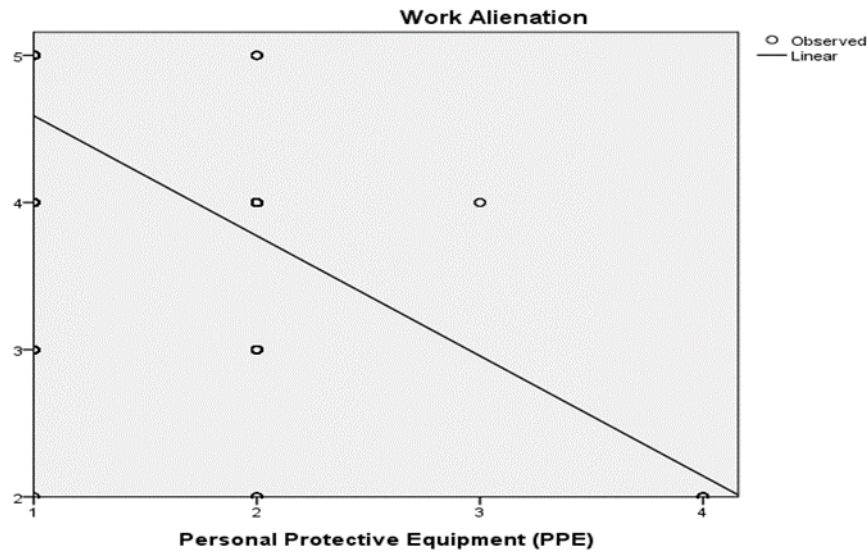


Figure 0-7: Negative relationship between work alienation and PPE

The regression output given in Table 7.16 shows that PPE explained 31.8% of the variance in the work alienation. This variance proportion is statistically significant because the F-value is 214.189, degree of freedom is 1 and p-value is 0.000. Hence, PPE contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.318
Adjusted R-Square	0.317
Sum of Squares	106.515
Df	1
F-Value	214.189
Significance Value	0.000

Table 0-16: Regression Model Summary for Work Alienation & PPE

Predictors: PPE

Dependent Variable: Work Alienation

Association between First Aid and Work Alienation

H3.B: 'There is an association between OSHAD SF (first aid) and work alienation.'

Table 7.13 shows that the correlation between first aid and work alienation is moderately weak with a coefficient value of -0.503. It reflects that the score for work alienation decreases moderately as first aid is provided in the Abu Dhabi construction sector. Figure 7.8 shows that first aid has moderate negative effects on work alienation.

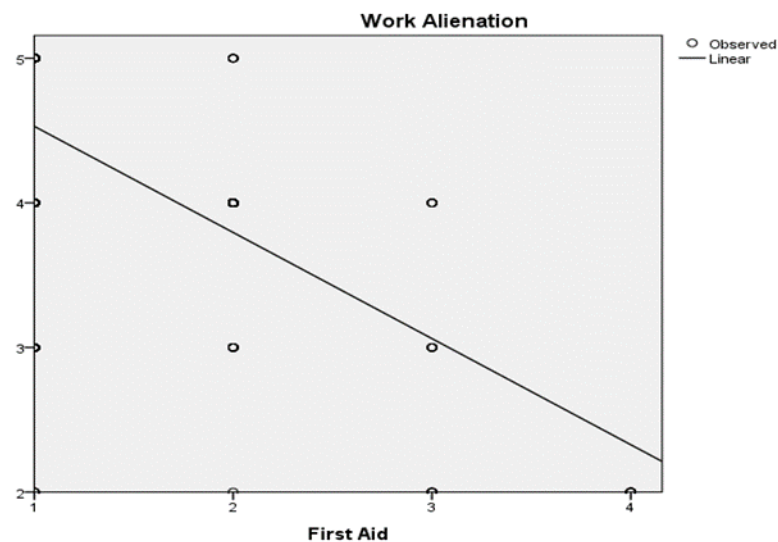


Figure 0-8: Negative relationship between work alienation and first aid

The regression output given in Table 7.17 shows that first aid explained 25.3% of the variance in the work alienation. This variance proportion is statistically significant because the F-value is 155.598, degree of freedom is 1 and p-value is 0.000. Hence, first aid contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.253
Adjusted R-Square	0.252
Sum of Squares	84.754
Df	1
F-Value	155.598
Significance Value	0.000

Table 0-17: Regression Model Summary for Work Alienation & First Aid

Predictors: First Aid
Dependent Variable: Work Alienation

Association between Safety in the Heat and Work Alienation

H3.C: 'There is an association between OSHAD SF (Safety in the Heat) and work alienation.'

Table 7.13 shows that the correlation between safety in the heat and work alienation is moderately weak with a coefficient value of -0.460. It reflects that the score for work alienation decreases moderately when safety in the heat is provided in the Abu Dhabi construction sector. Figure 7.9 shows that safety in the heat has moderately negative effects on work alienation.

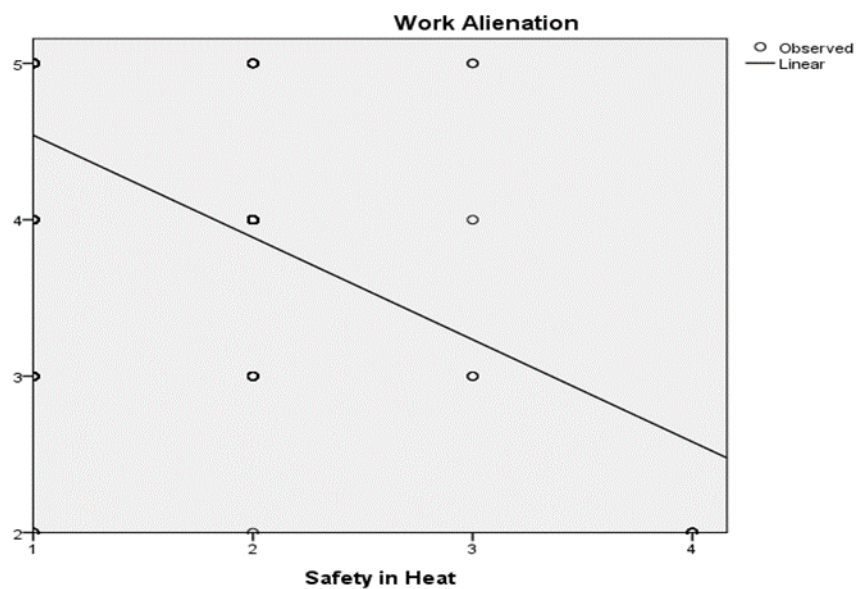


Figure 0-9: Negative relationship between work alienation and safety in the heat

The regression output given in Table 7.18 shows that safety in the heat explained 21.1% of the variance in the work alienation. This variance proportion is statistically significant because the F-value is 122.853, degree of freedom is 1 and p-value is 0.000. Hence, safety in the heat contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.211
Adjusted R-Square	0.209
Sum of Squares	70.684
Df	1
F-Value	122.853

Significance Value

0.000

Table 0-18: Regression Model Summary for Work Alienation & Safety in the Heat

Predictors: First Aid

Dependent Variable: Work Alienation

The Result for the Fourth Hypothesis

The fourth hypothesis of the study is:

Hypothesis 4: 'There is an association between OSHAD SF and job performance.'

In this hypothesis, the dependent variable is 'Job Satisfaction, while the independent variable is OSHAD SF (PPE, first aid, safety in the heat). The variables were tested in the context of the construction sector in Abu Dhabi. The results for this hypothesis were presented by performing the Pearson Coefficient Correlation test and a summarized Regression Model was developed to test the hypothesis (without considering the sub-hypotheses).

OSHAD SF	Job performance
PPE	0.404**
First Aid	0.434**
Safety in the Heat	0.478**

Table 0-19: Correlation coefficients for job performance & OSHAD SF

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 7.19, there was a moderately positive relationship between OSHAD SF and job performance, which means that the score for Job Satisfaction increases when the OSHAD SF implemented in the construction sector in Abu Dhabi. This result is supported in the literature. As mentioned above the main objective of OSH is to build a safe and healthy work-place, and to protect workers from any accidents and any adverse events. This builds a sense of security and safety among workers, enables their performance to improve and enhances their satisfaction. Research has shown a positive relationship between OSH practices and implementation and job performance (Yusuf, Eliyana, & Sari, 2012).

To test the developed hypothesis as a whole, a multiple regression was performed that revealed the following outcomes:

Model Summary	
R-Square	0.240
Adjusted R-Square	0.235
Sum of Squares	22.748
Df	3
F-Value	48.222
Significance Value	0.000

Table 0-20: Regression Model Summary for Job performance & OSHAD SF

Predictors: Safety in the Heat, PPE, First Aid

Dependent Variable: Job performance

	Estimates	Std. Error	T	Sig.
(Constant)	1.590	0.047	33.666	0.000
PPE	0.018	0.056	0.325	0.746
First Aid	0.119	0.058	2.075	0.039
Safety in the Heat	0.259	0.051	5.073	0.000

Table 0-21: Parameter Estimates of Regression Coefficient

As shown in Tables 7.20 and 7.21, the three OSHAD SF components explained 24% of the variance in job satisfaction. This variance proportion is statistically significant because the F-value is 48.222, degree of freedom is 3 and p-value is 0.000. Besides, the results in Table 7.21 indicate that both first aid and safety in the heat contributed significantly to predicting job performance, while PPE failed to contribute in this regard.

The regression equation is:

$$\text{Job Satisfaction} = 1.590 + 0.018 (\text{PPE}) + 0.119 (\text{First Aid}) + 0.259 (\text{Safety in the Heat})$$

The following sections (7.5.1 to 7.5.3) show the results for the sub-hypotheses derived from Hypothesis 4:

Association between Personal Protective Equipment and Job performance

H4.A: 'There is an association between OSHAD SF (PPE) and job performance.'

Table 7.19 shows that the correlation between PPE and job performance was moderately positive with a coefficient value of 0.404. It reflects the score for job satisfaction moderately well, because PPE is provided in the Abu Dhabi construction sector. Figure 7.10 shows that the PPE has a moderately positive effects on job satisfaction.

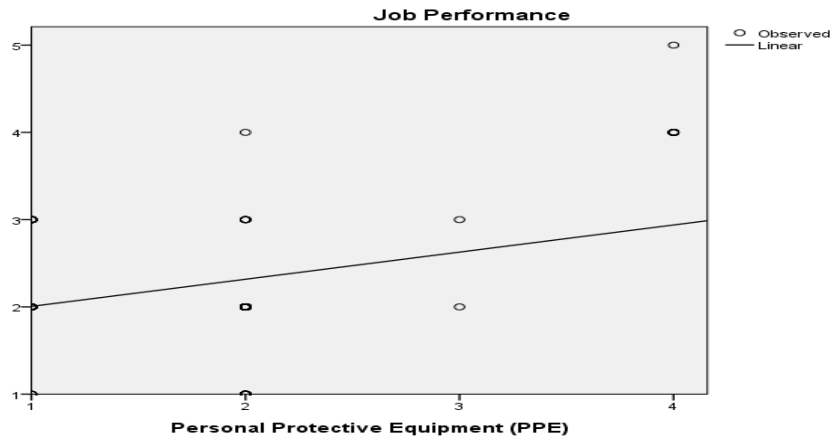


Figure 0-10: Positive relationship between job performance and PPE

The regression output given in Table 7.22 shows that PPE explained 16.3% of the variance in job satisfaction. This variance proportion is statistically significant because the F-value is 89.692, degree of freedom is 1 and p-value is 0.000. Hence, PPE contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.163
Adjusted R-Square	0.162
Sum of Squares	15.465
Df	1
F-Value	89.692
Significance Value	0.000

Table 0-22: Regression Model Summary for Job performance & PPE

Predictors: PPE

Dependent Variable: Job performance

Association between First Aid and Job performance

H4.B: 'There is an association between OSHAD SF (first aid) and job performance.'

Table 7.19 shows that the correlation between first aid and job performance is moderately positive with a coefficient value of 0.434. It reflects that the score for job satisfaction increases moderately when first aid is provided in the Abu Dhabi construction sector. Figure 7.11 shows that first aid has moderately positive effects on job performance.

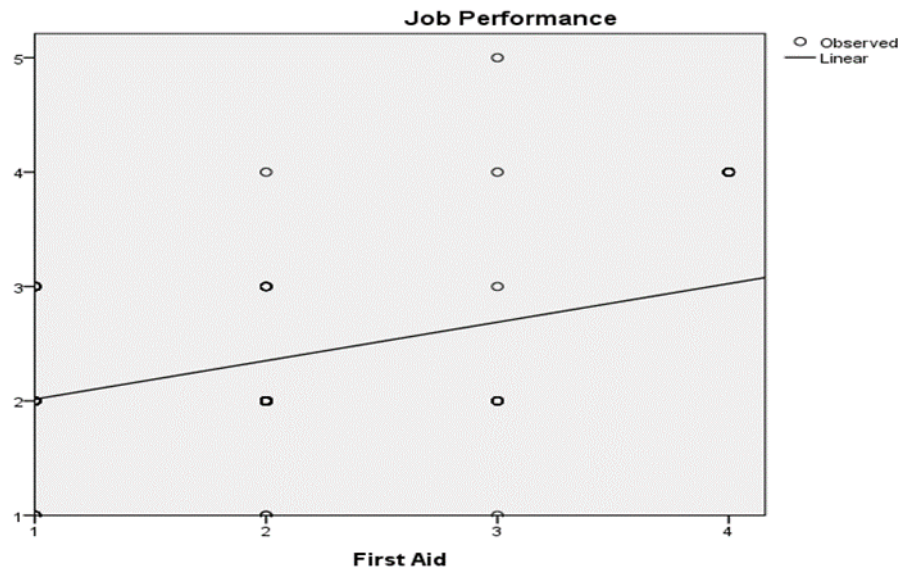


Figure 0-11: Positive relationship between job performance and first aid

The regression output given in Table 7.23 shows that first aid explained 18.9% of the variance in the job satisfaction. This variance proportion was statistically significant because the F-value is 106.645, degree of freedom is 1 and p-value is 0.000. Hence, first aid contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.189
Adjusted R-Square	0.187
Sum of Squares	17.837
Df	1
F-Value	106.645
Significance Value	0.000

Table 0-23: Regression Model Summary for Job performance & First Aid

Predictors: First Aid

Dependent Variable: Job Performance

Association between Safety in the Heat and Job Performance

H4.C: 'There is an association between OSHAD SF (Safety in the Heat) and job performance.'

Table 7.19 shows that the correlation between safety in the heat and job performance is moderately positive with a coefficient value of 0.478. It reflects that the score for job satisfaction increases moderately when the safety in the heat is provided in the Abu Dhabi construction sector. Figure 7.12 shows that safety in the heat has moderately positive effects on job performance.

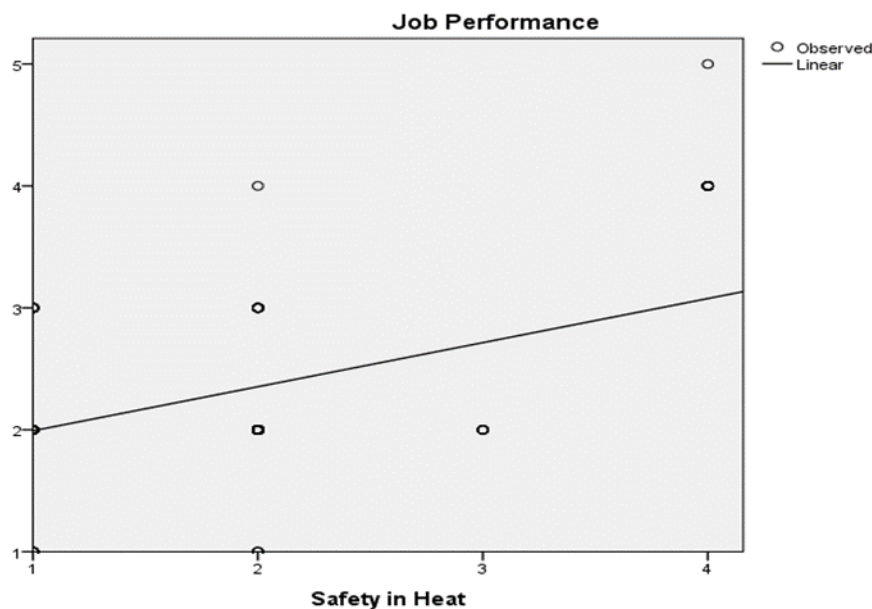


Figure 0-12: Positive relationship between job performance and safety in the heat

The regression output given in Tables 7.24 shows that safety in the heat explained 22.9% of the variance in the job performance. This variance proportion is statistically significant because the F-value is 136.027, degree of freedom is 1 and p-value is 0.000. Hence, safety in the heat contributes significantly in this regard; therefore, the hypothesis cannot be rejected.

Model Summary	
R-Square	0.229
Adjusted R-Square	0.227
Sum of Squares	21.628
Df	1
F-Value	136.027
Significance Value	0.000

Table 0-24: Regression Model Summary for Job Performance & Safety in the Heat
Predictors: Safety in the Heat
Dependent Variable: Job Performance

The Result for Workers' Personal Traits and Job Performance

In this section, the relationship between the workers' personal traits and job performance was identified in order to discover how far personal traits such as self-efficacy, outcome expectancy, actively caring behaviour, and attitude influence the job performance of the workers in the Abu Dhabi construction sector. To accomplish this, a Pearson Coefficient Correlation test was run to determine the relationship between the variables and a Regression Model was developed along with structural modeling to determine this relationship.

OSHAD SF	Job Performance
Self-efficacy	0.436**
Outcome Expectancy	0.014
Actively Caring Behaviour	0.448**
Attitude	-0.210**

Table 0-25: Correlation coefficients for job Performance and Workers' Personal Traits

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 7.25, the positive and moderate relationship was found between job performance, self-efficacy, and actively caring behaviour with a coefficient value of 0.436 and 0.448 respectively, which implies that the increase in self-efficacy and actively caring behaviour moderately improves job performance. Besides, a positive but weak relationship was found between job performance and outcome expectancy with the coefficient value of 0.014, which means that the very slight increase in the score of outcome expectancy slightly improves job performance. In contrast, a negative and weak relationship was found between job performance and attitude with a coefficient value of -0.210, which implies that a slight decrease in the score of attitudes affects workers' job performance.

To test this relationship, a multiple regression was performed that revealed the following outcomes:

Model Summary	
R-Square	0.276
Adjusted R-Square	0.270
Sum of Squares	26.154
Df	4
F-Value	43.555
Significance Value	0.000

Table 0-26: Regression Model Summary for Work Alienation & OSHAD SF

Predictors: Self-Efficacy, Outcome Expectancy, Actively Caring Behaviour, and Attitude

Dependent Variable: Job performance

	Estimates	Std. Error	T	Sig.
(Constant)	1.039	0.220	4.721	0.000
Self-Efficacy	0.199	0.036	5.563	0.000
Outcome Expectancy	0.048	0.042	1.149	0.251
Actively Caring Behaviour	0.336	0.046	7.310	0.000
Attitude	-0.011	0.038	-0.300	0.764

Table 0-27: Parameter Estimates of Regression Coefficient

As shown in Tables 7.26 and 7.27, the four Workers' Traits explained 27.6% of the variance in Job Performance. This variance proportion was statistically significant because the F-value is 43.555, degree of freedom is 4 and p-value is 0.000. Besides, the results in Table 7.27 indicate that both Self-Efficacy and Actively Caring Behaviour contributed significantly to predicting Job Performance, while Outcome Expectancy and Attitude failed to contribute in this regard.

The regression equation is:

$$\text{Job Performance} = 1.039 + 0.199 (\text{Self-Efficacy}) + 0.048 (\text{Outcome Expectancy}) + 0.336 (\text{Actively Caring Behaviour}) - 0.011 (\text{Attitude})$$

Moreover, to test this hypothesized relationship between these variables, a path diagram is drawn using IBM SPSS AMOS, which helped in estimating, assessing and presenting the model. Figure 7.13 shows the path model for the variables job performance (dependent variable) and Self-Efficacy, Actively Caring Behaviour, Outcome Expectancy and Attitude (independent variables).

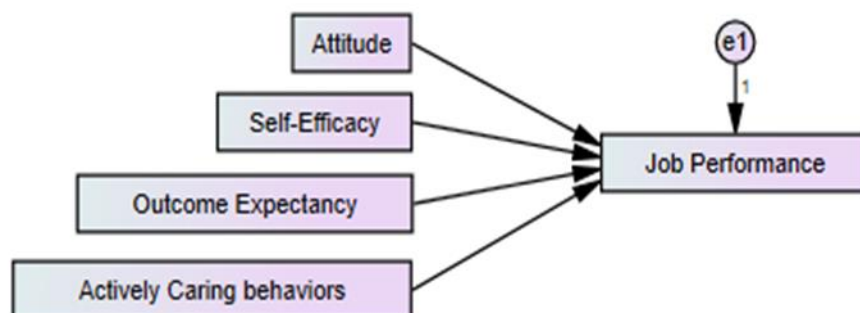


Figure 0-13: Path diagram of the relationship between job performance and personal traits

Figure 7.14, below, shows the parameter estimates of the path analysis, while Table 7.28 shows the key estimates obtained from the AMOS output.

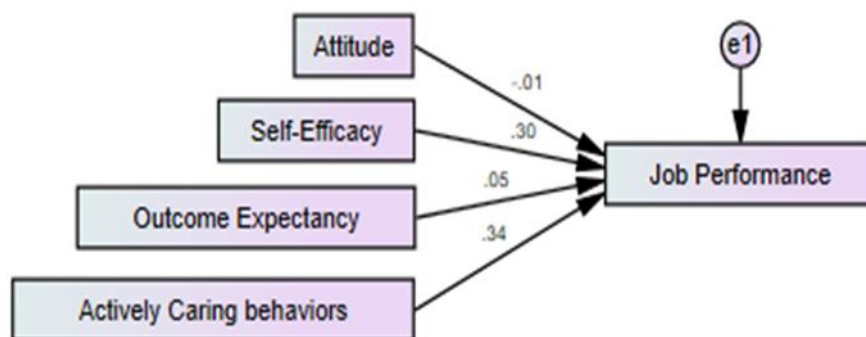


Figure 0-14: Path diagram of the relationship between job performance and personal traits

	Estimates
CMIN/DF	0.907
Comparative Fit Index (CFI)	1.00
Goodness of Fit Index (GFI)	0.998
Root Mean Square Error of Approximation (RMSEA)	0.00

Table 0-28: AMOS Estimates – Relationship between Job Performance and Personal Traits

To determine the goodness of fit for the model, certain measures were considered such as chi-square, CFI, GFI and RMSEA. According to West et al. (2012), the chi-square should be smaller

in order to be not significant. However, in this case, the model is significant because the CMIN/DF value is 1.8, that is, <3 . Likewise, West et al. (2012) found that for the model to be accepted the CFI and GFI values should be ≥ 0.90 . However, in this case it can be seen that the value of CFI is 1.00 and the GFI is 0.998, which means that the model cannot be accepted. Finally, West et al. (2012) have suggested that the value of RMSEA should be ≤ 0.08 , which indicates a good model fit. In this case, it can be seen that the value is 0.000. Therefore, it can be said that the RMSEA shows a good model fit for job performance and workers' traits in the Abu Dhabi construction industry, implying that the model fitted the data.

Results for OSHAD SF and Continuance Commitment

In this section, the correlation between the OSHAD SF (PPE, first aid and safety in the heat) and continuance commitment was identified to see how far continuance commitment was influenced by OSHAD SF. To this end a Pearson Coefficient Correlation test was run, using SPSS. The results are given in Table 7.29.

OSHAD SF	Continuance Commitment
PPE	-0.176**
First Aid	-0.075
Safety in the Heat	-0.155**

Table 0-29: Correlation Coefficient for Continuance Commitment and OSHAD SF

**. Correlation is significant at the 0.01 level (2-tailed).

It is shown in Table 7.29 that there is a weak and negative relationship between OSHAD SF and Continuance Commitment, which means that the score for Continuance Commitment decreases when the OSHAD SF increases in the Abu Dhabi construction sector.

The literature defines continuance commitment as commitment in which workers identify investments, costs and alternatives related with leaving an organization. If the continuance commitment is high, then employees will stay with the organization (Khan, Naseem, & Masood , 2016).

Results for OSHAD SF and Normative Commitment

In this section, the correlation between the OSHAD SF (PPE, first aid and safety in the heat) and normative commitment was identified to establish how far normative commitment was influenced

by OSHAD SF. To accomplish this, a Pearson Coefficient Correlation test took place using SPSS. The results are given in Table 7.30.

OSHAD SF	Normative Commitment
PPE	0.151**
First Aid	0.271**
Safety in the Heat	0.275**

Table 0-30: Correlation Coefficient for Normative Commitment and OSHAD SF

**, Correlation is significant at the 0.01 level (2-tailed).

It is shown in Table 7.30 that there is a weak positive relationship between OSHAD SF and Normative Commitment, which means that the score for Normative Commitment increases slightly when OSHAD SF increases in the Abu Dhabi construction sector.

Results for OSHAD SF and Organizational Commitment

In this section, the correlation between the OSHAD SF (PPE, first aid and safety in the heat) and organizational commitment is identified to find how far organizational commitment is influenced by OSHAD SF. Pearson Coefficient Correlation testing was used for this purpose using SPSS. The results are given in Table 7.31.

OSHAD SF	Organizational Commitment
PPE	0.480**
First Aid	0.499**
Safety in the Heat	0.478**

Table 0-31: Correlation Coefficient for Organizational Commitment and OSHAD SF

**, Correlation is significant at the 0.01 level (2-tailed).

It is shown in Table 7.31 that there is a moderate and positive relationship between OSHAD SF and Organizational Commitment, which means that the score for Organizational Commitment increases moderately when OSHAD SF increases in the Abu Dhabi construction sector.

The Result for Workers Personal Traits and OSHAD SF

In this section, the correlation between the OSHAD SF (PPE, first aid and safety in the heat) and some personal traits of workers (self-efficacy, outcomes expectancy, actively caring behaviour, and attitude) is identified to discover how far the personal traits were influenced by OSHAD SF. To this end, Pearson Coefficient Correlation testing was carried out, using SPSS. The results are given in Table 7.32.

Personal Traits	OSHAD SF		
	PPE	First Aid	Safety in the Heat
Self-efficacy	0.586**	0.577**	0.600**
Outcome Expectancy	-0.020	0.039	0.023**
Actively Caring Behaviour	0.321**	0.454**	0.454**
Attitude	-0.463**	-0.338**	-0.338**

Table 0-32: Correlation coefficients for workers' personal traits and OSHAD SF

**, Correlation is significant at the 0.01 level (2-tailed).

It is shown in Table 7.33 that there is a moderate and positive relationship between self-efficacy, PPE, first aid and safety in the heat, which means that the score for self-efficacy increases moderately when OSHAD SF increases in the Abu Dhabi construction sector.

In addition, there is a weak relationship between outcome expectancy, PPE, first aid and safety in the heat, which means that the score for outcome expectancy decreases or is in some way affected when OSHAD SF decreases in the Abu Dhabi construction sector.

Moreover, there is moderate and positive relationship between actively caring behaviour, PPE, first aid and safety in the heat, which means that the score for actively caring behaviour increases moderately as the OSHAD SF increases in this sector.

Finally, there is a weak negative relationship among outcome attitude, PPE, first aid and safety in the heat, which means that the score for attitude decreases significantly when the OSHAD SF decreases in the Abu Dhabi construction sector.

The Result for Relationship between Workers Personal Traits, OSHAD SF, and Job Performance

In this section, the relationship between the workers' personal traits (self-efficacy, outcome expectancy, actively caring behaviour, and attitude), OSHAD SF and job performance is identified by taking personal traits as moderate variables in order to know how far these variables together influence the job performance of the workers in Abu Dhabi construction sector. A Regression Model was developed to determine this relationship.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.563 ^a	.317	.306	.378	.317	29.979	7	453	.000

Table 0-33: Regression Model Summary for Workers' Traits, OSHAD SF and Job Performance
Model Summary

a. Predictors: (Constant), Attitude, Outcome Expectancy, Actively Caring behaviours, Personal Protective Equipment (PPE), Self-Efficacy , Safety in the Heat, First Aid

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.952	7	4.279	29.979	.000 ^b
	Residual	64.656	453	.143		
	Total	94.607	460			

a. Dependent Variable: Job Performance

b. Predictors: (Constant), Attitude, Outcome Expectancy, Actively Caring Behaviours, Personal Protective Equipment (PPE), Self-Efficacy , Safety in the Heat, First Aid

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.903	.226		4.003	.000
	PPE	.056	.057	.073	.993	.321
	First Aid	.012	.057	.016	.217	.828
	Safety in the Heat	.153	.051	.202	2.967	.003
	Self-Efficacy	.119	.039	.175	3.101	.002

Outcome Expectancy	.034	.041	.033	.837	.403
Actively Caring behaviours	.264	.048	.256	5.463	.000
Attitude	.030	.038	.037	.771	.441

a. Dependent Variable: Job Performance

The regression output given in Table 7.33 shows that personal traits and OSHAD SF together explain 30,6% of the variance in job performance. This variance proportion is statistically significant because the F-value is 29.979, degree of freedom is 7 and p-value is 0.000. When all the research constructs are considered together only Safety in the Heat, Self-Efficacy and Actively Caring Behaviours positively and significantly contribute to the job performance.

Testing for Collinearity of the Independent Variables

Collinearity (or multicollinearity) is an undesirable situation in which one of the independent variables is a linear function of the other independent variables. It shows the eigenvalues of the non-centered and scaled vector product matrix, the condition indices and the proportions of the variance decomposition together with the variance inflation factors (IVF) and the tolerances for the individual variables (West et al., 2012). The collinearity results for the independent variables of the study, which were OSHAD SF and Personal Traits, are given in Table 7.34.

Table 0-34: Testing the Collinearity between variables

Collinearity Diagnostics ^a										
Mode	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	PPE	First Aid	Safety in the Heat	Self-Efficacy	Outcome Expectancy	Actively Caring behaviours
1	1	7.482	1.000	.00	.00	.00	.00	.00	.00	.00
	2	.295	5.034	.00	.02	.02	.03	.02	.01	.00
	3	.088	9.237	.00	.04	.06	.02	.69	.00	.00
	4	.047	12.602	.00	.29	.03	.66	.03	.01	.07
	5	.039	13.846	.00	.21	.60	.20	.00	.02	.13
	6	.027	16.597	.00	.33	.22	.05	.05	.15	.53
	7	.017	21.091	.00	.00	.00	.04	.10	.48	.22
	8	.004	40.941	.99	.10	.06	.00	.11	.34	.04

a. Dependent Variable: Job Performance

In order to interpret the results, a conditioning index (CI) is considered. According to West et al. (2012), the conditioning index is the square root of the quotient between the maximum and the minimum eigenvalues that determines whether or not collinearity exists between the independent variables. If the CI is greater than 30, there is high collinearity; if the CI is greater than 10 and less than 30, the collinearity is moderate; if the CI is less than 10, there is no collinearity. Thus, in the above table, it can be seen that the CI index for 7 variables out of 8 is less than 30, which means that there is moderate collinearity between most of the variables.

Examining Residuals using Scatter Plots

Although most of the assumptions of multiple regression cannot be accurately verified, researchers can detect deviations from these assumptions. In particular, outliers (that is, extreme observations) can cause a serious shift in the estimates, "shifting" the regression line in a certain direction and thereby causing a shift in the regression coefficients. Often the exclusion of just one extreme observation leads to a completely different result (West et al., 2012).

The residuals' statistical results obtained from the regression analysis are illustrated in Table 7.35. The results confirm that the residual mean is zero.

Table 0-35: Residuals' Statistics

Residuals' Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.64	3.49	2.10	.255	461
Residual	-1.429	2.049	.000	.375	461
Std. Predicted Value	-1.792	5.440	.000	1.000	461
Std. Residual	-3.783	5.424	.000	.992	461

a. Dependent Variable: Job Performance

Furthermore, in the graph (Figure 7.15), it can be seen that there is a pattern of behaviour of the residuals with respect to Y. Therefore, it can be said that these random variables are correct. Thus, the assumption of error term independence is untenable.

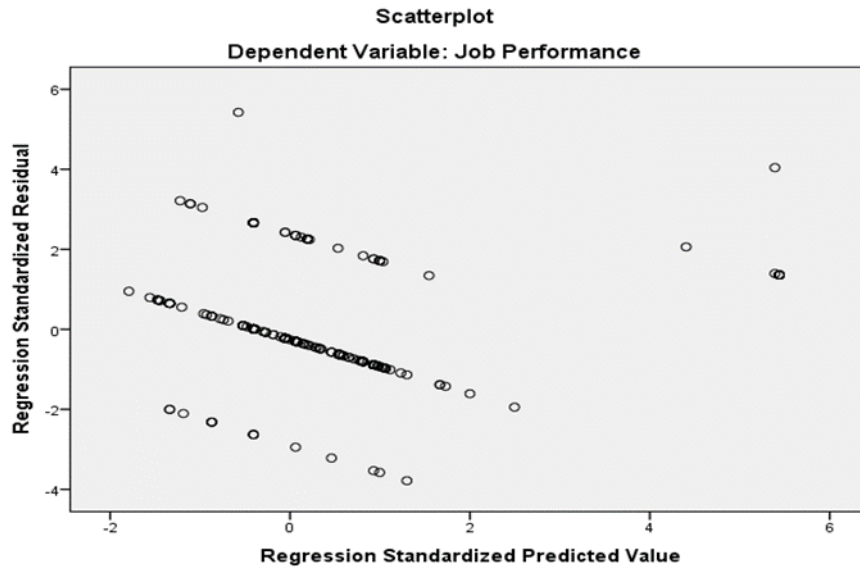


Figure 0-15: Scatter plot for residual results from the model

The histogram of the residuals allows us to check graphically the hypothesis of normality; an aspect that should be taken into account in interpreting the results of statistical inference. In this case, it can be seen from Figure 7.16 that the distribution is bell-shaped and has less of a gap in the center that can be, in part, a consequence of the defined intervals.

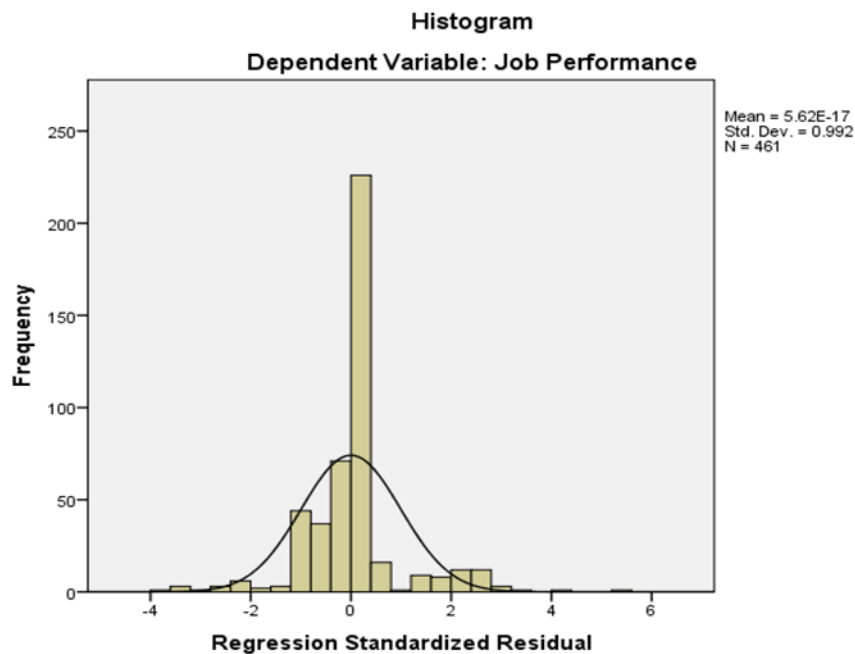


Figure 0-16: Histogram of the frequency of the standardized residuals

Finally, the PP diagram (Figure 7.17) compares the accumulated frequency for the typified residuals with the expected probability under the normality hypothesis. It is observed that these differences could be significant in some areas (between 0.5 and 0.8 cum prob axis) of the graph; which, if true, would cast doubt on the validity of the residual normality hypothesis. However, the criterion for deciding if the hypothesis of normality can be rejected will be the one which provides some of the normality contrasts.

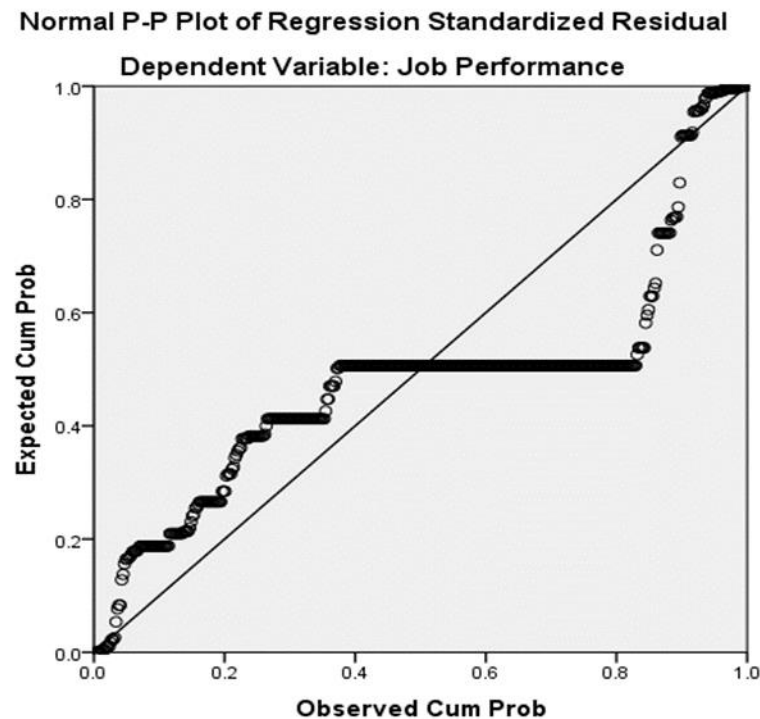


Figure 0-17: Normal P-P plot of regression standardized residual for the dependent variable

Confirming the research constructs association

Structural Model and Hypotheses Testing

The previous sections reported on the association between the dependent and independent research variables using simple and multiple regression. This section reports on the structural or path models used to assess the relationship between the research constructs. To do this, several path models were constructed using AMOS. The results from these are reported in the following sections.

Relationship between health and safety and personal traits

The first path analysis model that was created was intended to depict the relationship between health and safety practices and personal traits. The path diagram is shown in the figure below.

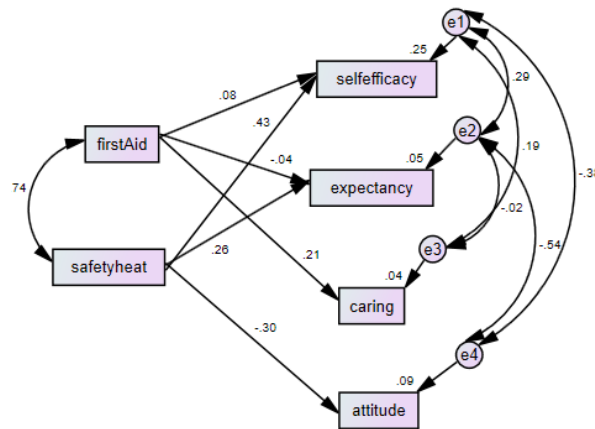


Figure 0-18: Relationship between health and safety management systems and personal traits

The model fit metrics and standardized regression coefficients produced by AMOS re illustrated in Table 7.36 and Figure 7.18. These threshold measures demonstrate that the structural model provided a good fit to the data in this research. The hypothesized model appears to be a good fit to the data. The CFI is 0.995; P close is 0.377; CMIN/df is 2.240; and the RMSEA is 0.054. The model predicts 25 % of the variance in self- efficacy, 5% of expectancy; 0.04% of caring and 9% of attitude.

. There were several paths between personality traits and health and safety practices that were found to be significant. The regression paths between Self-efficacy <--- First-Aid and expectancy <---First-Aid were insignificant.

The regression weight for caring is a good predictor of first aid practices, whereas the regression weights for self-efficacy, expectancy and attitude were significant in predicting the safety of heat practices. The results demonstrated that the association between safety of heat practices and attitude was negative. First-Aid had a significant positive impact on caring. Safety in the heat had a significant positive impact on Self-efficacy and expectancy.

Measure	Threshold	Model fitness
χ^2		6.720

CMIN/df	< 3, sometime < 5 is acceptable	2.240
P value of the model	>0.05	0.081
CFI	> 0.9	0.995
GFI	>0.95	0.995
AGFI	>0.8	0.964
RMSEA	<0.05 sometimes <0.05-0.08	0.054
P close	>0.05	0.377

Table 0-36: Model fitness measures

	Estimate	S.E.	C.R.	P
Self-efficacy <--- First-Aid	.209	.139	1.501	.133
expectancy <--- First-Aid	-.045	.063	-.768	.443
caring <--- First-Aid	.207	.030	4.413	***
Self-efficacy <--- Safety-heat	.432	.143	7.419	***
expectancy <--- Safety-heat	.265	.069	4.156	***
attitude <--- Safety-heat	-.299	.191	-6.516	***

Table 0-37: Standardized regression weights

***p < .001

Studies show that certain types of people were safer than others. If so, organizations can design selection systems to single out these safe people for employment purposes. In short, some personal traits seem to predict safety-related behaviour (Beus, 2015).

Relationship between HSE, personal traits and organizational commitment

The second path model was to check whether the personality traits mediate/moderate the relationship between health and safety practices and organizational commitment. The figure below illustrates the second structural model with the regression coefficients.

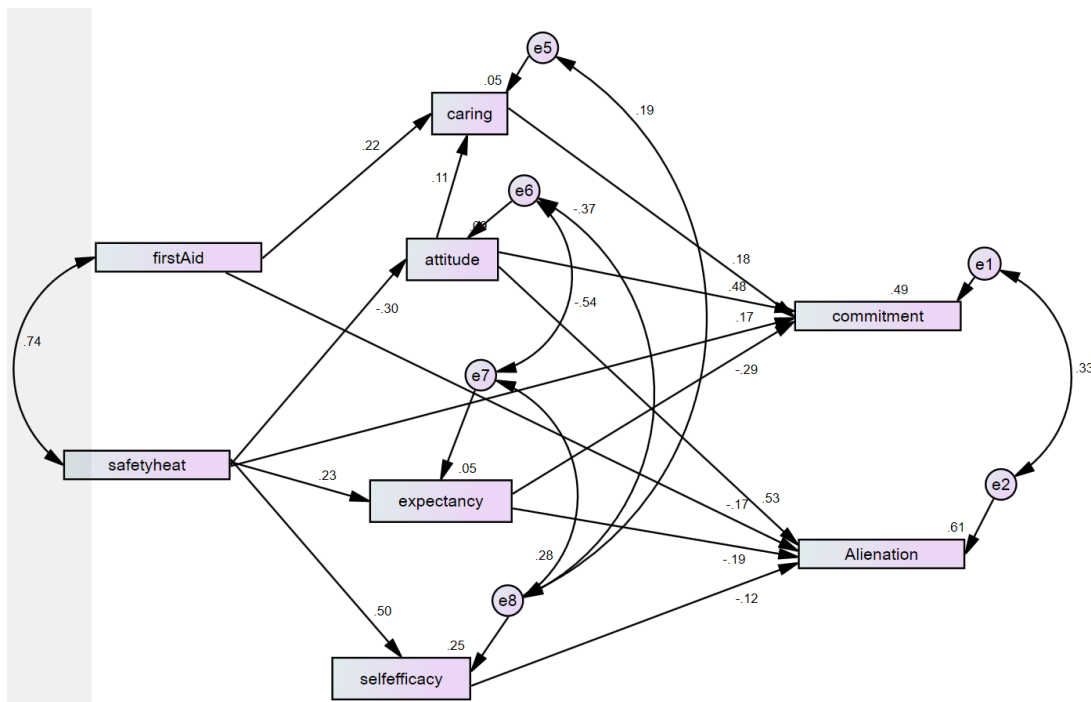


Figure 0-19: Relationship between HSE, personal traits and organizational commitment

The model fitness measures in Table 38 7 show that the generated model fitness measures conform to the threshold values. Thus, the structural model is fit. The standardized regression coefficients and their significance are also shown in Table 39 7. The results indicate that all the regression coefficients of the model variable were significant at $P < 0.001$. The figure and table also demonstrate the following findings.

First aid has a positive significant relationship with caring, while it has a negative relationship with alienation. Previous studies have shown that there is a negative relationship between individual consideration and work alienation (Kayank, Toklu, & Toklu, 2016). Since offering first aid is considered sign of an employer's consideration of workers' safety and health, this will have a negative impact on alienation and will contribute to reducing alienation.

Safety in the heat practices have a positive impact on expectancy and self-efficiency, while it has a negative impact on attitude.

Checking personal traits with alienation shows that expectancy and self-efficacy have a negative association while attitude has a positive association with it. In terms of commitment, it has positive

significant influence on attitude and caring while it has a negative significant influence on expectancy.

The three tables below list the model fitness measures of the above relationship, standardized regression weights, and standardized total effects.

Measure	Threshold	Model fitness
χ^2		12.272
CMIN/df	< 3, sometimes < 5 is acceptable	1.227
P value of the model	>0.05	0.673
CFI	> 0.9	0.999
GFI	>0.95	.993
AGFI	>0.8	.975
RMSEA	<0.05 sometimes <0.05-0.08	0.03
P close	>0.05	.869

Table 0-38: Model fitness measures

			Estimate	S.E.	C.R.	P
caring	<---	First-Aid	.197	.030	4.227	***
attitude	<---	Safety-heat	-.299	.191	-6.516	***
expectancy	<---	Safety-heat	.231	.050	4.944	***
Self-efficacy	<---	Safety-heat	.494	.102	11.930	***
Alienation	<---	expectancy	-.188	.109	-5.080	***
commitment	<---	expectancy	-.298	.210	-6.993	***
Alienation	<---	Self-efficacy	-.118	.044	-3.463	***
commitment	<---	attitude	.485	.055	11.179	***
Alienation	<---	attitude	.529	.030	13.619	***
Alienation	<---	First-Aid	-.167	.100	-5.355	***
commitment	<---	caring	.181	.278	5.433	***
commitment	<---	Safety-heat	.173	.191	4.816	***

Table 0-39: Standardized regression weights

The relationship is significant at *** $p < .001$, * $p < .05$

	Safety-heat	First-Aid	Self-efficacy	expectancy	attitude	caring
Self-efficacy	.494	.000	.000	.000	.000	.000
expectancy	.231	.000	.000	.000	.000	.000
attitude	-.299	.000	.000	.000	.000	.000
caring	.000	.197	.000	.000	.000	.000
commitment	-.041	.036	.000	-.298	.485	.181
Alienation	-.260	-.167	-.118	-.188	.529	.000

Table 0-40: Standardized Total Effects

The direct effect of safety in the heat and first aid practices on personality traits and organizational commitment are shown in Table 7-40. The results show that safety in the heat has a positive relationship with the following personal traits: self-efficacy, expectancy. It has a negative relationship with attitude. Safety in the heat has a positive relationship with commitment,.

Meanwhile, first aid practices have a positive relationship with caring, and a negative influence on alienation.

The relationship between commitment and different personal traits has a negative impact on self-efficacy and expectancy, but it has a positive relationship with attitude.

Finally, the table shows a negative relationship between alienation and self-efficacy and expectancy, and it shows a positive relationship between alienation and attitude.

	Safety- heat	First- Aid	Self- efficacy	expectancy	attitude	caring
Self-efficacy	.494	.000	.000	.000	.000	.000
expectancy	.231	.000	.000	.000	.000	.000
attitude	-.299	.000	.000	.000	.000	.000
caring	.000	.197	.000	.000	.000	.000
commitment	.173	.000	.000	-.298	.485	.181
Alienation	.000	-.167	-.118	-.188	.529	.000

Table 0-41: Standardized Direct Effects

The table below shows the indirect effect of health and safety practices on personal traits and the research constructs of organizational commitment. The indirect effect of first aid on commitment via caring is positive but small. The indirect effect of safety-heat practices on alienation and commitment via the paths of self-efficacy and attitude is negative.

	Safety- heat	First- Aid	Self- efficacy	expectancy	attitude	caring
Self-efficacy	.000	.000	.000	.000	.000	.000
expectancy	.000	.000	.000	.000	.000	.000
attitude	.000	.000	.000	.000	.000	.000
caring	.000	.000	.000	.000	.000	.000
commitment	-.214	.036	.000	.000	.000	.000

	Safety- heat	First- Aid	Self- efficacy	expectancy	attitude	caring
Alienation	-.260	.000	.000	.000	.000	.000

Table 0-42: Standardized Indirect Effects

Relationship between HSE, personal traits organizational commitment and performance

The model shown in the figure below correlates and integrates all HSE, personal traits, and organizational commitment to the performance construct. It also provides a structural link from performance to the health and safety practices. The model is implemented in SPSS Amos. To derive the fit model, several linkage trials were carried out. The absenteeism construct was found to contribute to the model degeneration (lack of fit). Hence it was removed. The linkage between first aid also had a direct link only with the attribute of caring, although in the sub-model above it was found to be correlated with the caring, self-efficacy and expectancy variables. The derived model structure is shown in Figure 7-20, below.

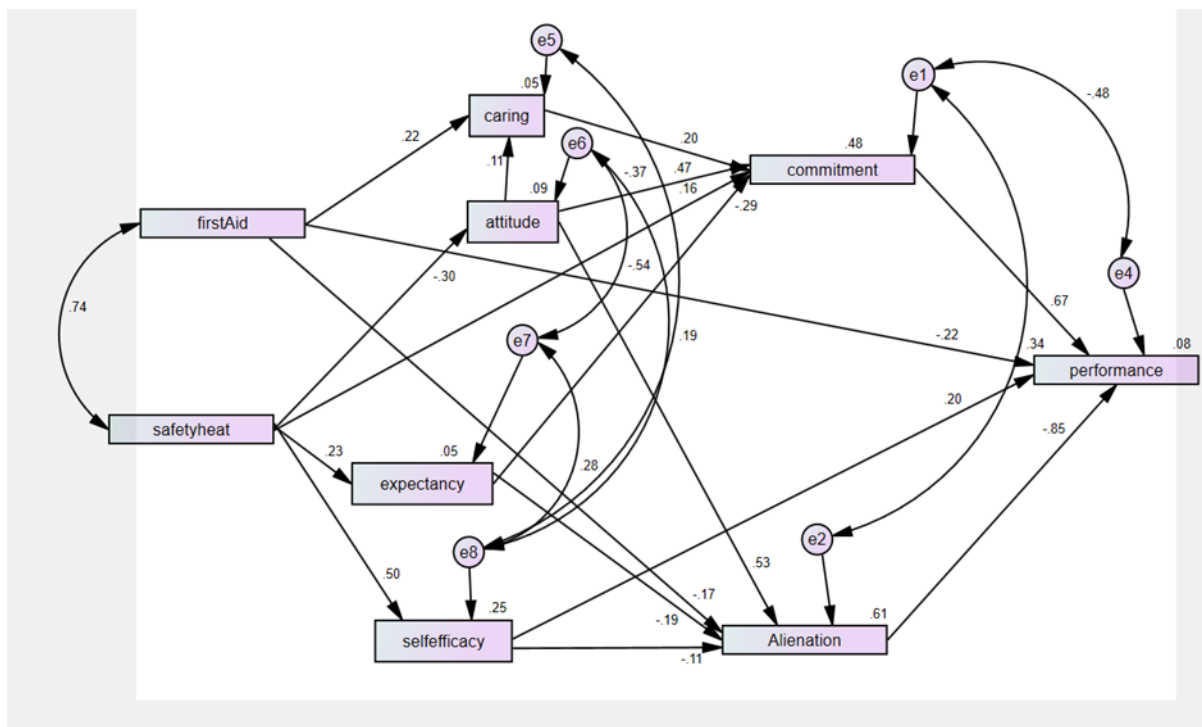


Figure 0-20: Relationship between HSE, personal traits organizational commitment and performance

The table below shows the model fit threshold measures in the specified limits (Hair, 2006). The results showed that the fit model indices were $\chi^2 = 9.131$, CMIN/df = 0.761, P value of the model = 0.952, GFI = 0.995, CFI = 1.00, P close = 0.692 and RMSEA = 0.000. These were all in the specification limits. Therefore, this demonstrates that the derived model fits.

Measure	Threshold	Model fitness
χ^2		9.131
CMIN/df	< 3, sometime < 5 is acceptable	.761
P value of the model	>0.05	0.962
CFI	> 0.9	1.00
GFI	>0.95	0.995
AGFI	>0.8	0.983
RMSEA	<0.05 sometime <0.05-0.08	0.000
P close	>0.05	0.692

Table 0-43: Model fitness

The results of using The Maximum Likelihood Estimation (MLE) to estimate the level of association between the tested variables shows that safety-heat has a significant negative influence on attitude. Similarly, the results indicate that safety-heat has a significance positive influence on commitment, expectancy and self-efficiency. First aid was shown to have a positive influence on caring, and a negative significant influence on alienation, and performance. The trait of attitude was found to have a positive significant influence on caring, commitment, and alienation. The expectancy trait was found to have a negative significant influence on alienation and commitment. The self-efficacy construct was found to have a negative significant influence on alienation and a positive significant influence on performance. Caring has a positive significant influence on commitment alone. The commitment construct is found to have positive significant influence on performance. The result shows that alienation has a negative significant influence on performance. The relative contribution of each predictor variable to each outcome in this research is shown in the table below. The results showed that most of the variables have medium effect.

		Estimate	S.E.	C.R.	P
attitude	<--- Safety-heat	-.299	.191	-6.516	***
caring	<--- First-Aid	.223	.030	4.704	***
expectancy	<--- Safety-heat	.231	.050	4.944	***

		Estimate	S.E.	C.R.	P
Self-efficacy	<--- Safety-heat	.495	.101	11.964	***
caring	<--- attitude	.114	.007	2.384	.017*
Alienation	<--- expectancy	-.188	.109	-5.090	***
commitment	<--- expectancy	-.287	.188	-7.592	***
Alienation	<--- Self-efficacy	-.115	.044	-3.406	***
commitment	<--- attitude	.472	.051	11.982	***
Alienation	<--- attitude	.531	.029	13.718	***
Alienation	<--- First-Aid	-.168	.099	-5.397	***
commitment	<--- caring	.200	.252	6.729	***
commitment	<--- Safety-heat	.164	.178	4.946	***
performance	<--- commitment	.667	.001	5.349	***
performance	<--- Alienation	-.847	.001	-8.220	***
performance	<--- Self-efficacy	.198	.001	4.043	***
performance	<--- First-Aid	-.216	.002	-3.968	***

Table 0-44: Standardized Regression

The relationship is significant at *** $p < .001$, * $p < .05$

The Squared Multiple Correlations result is shown in Figure 7-20 and Table 7-45. The values in the tables signify the proportion of variance in the dependent variables that is explained by the collective set of predictors. In this research the performance (dependent variable) can explain 8% of the variation that exists in the attitude, self-efficacy, expectancy, caring, commitment and alienation predictors as (independent) variables. For instance, the R2 value for Alienation is 0.608, indicating that a considerable proportion of variance is explained by health and safety practices and personality traits at the organizational commitment level. Similarly, 48% of the variation in safety practices and personality traits is explained at the organizational commitment level. The R2 value for Self-efficacy is 0.245, indicating that 25% of variance in health and safety practices is explained at the level of personality traits.

	Estimate
attitude	.089
Self-efficacy	.245
expectancy	.053
caring	.052
commitment	.483
Alienation	.608
performance	.080

Table 0-45: Squared Multiple Correlations

The result of Standardized Total Effects is shown in Table 7-46. The results showed that safety-heat is negatively associated with attitude, caring, commitment and alienation, whereas, safety-heat is supportively associated with Self-efficacy, Expectancy and performance. First aid is negatively associated with alienation and performance. First Aid practices were found to be positively associated with caring and commitment. The performance construct is inherently associated with attitude, expectancy, first aid, and alienation predictors.

	Safety-heat	First-Aid	attitude	Self-efficacy	expectancy	caring	commitment	Alienation
attitude	-.299	.000	.000	.000	.000	.000	.000	.000
Self-efficacy	.495	.000	.000	.000	.000	.000	.000	.000
expectancy	.231	.000	.000	.000	.000	.000	.000	.000
caring	-.034	.223	.114	.000	.000	.000	.000	.000
commitment	-.050	.045	.494	.000	-.287	.200	.000	.000
Alienation	-.259	-.168	.531	-.115	-.188	.000	.000	.000
performance	.284	-.044	-.120	.295	-.032	.134	.667	-.847

Table 0-46: Standardized Total Effects

The direct effect of safety-heat and first aid practices on the personality traits and organizational commitment are shown in the table below. Both practices have a positive influence on Self-efficacy, expectancy, caring and commitment. However, safety-heat practices have a negative influence on attitude. However, attitude has a positive influence on caring, commitment and alienation.

	Safety-heat	First-Aid	attitude	Self-efficacy	expectancy	caring	commitment	Alienation
attitude	-.299	.000	.000	.000	.000	.000	.000	.000
Self-efficacy	.495	.000	.000	.000	.000	.000	.000	.000
expectancy	.231	.000	.000	.000	.000	.000	.000	.000
caring	.000	.223	.114	.000	.000	.000	.000	.000
commitment	.164	.000	.472	.000	-.287	.200	.000	.000
Alienation	.000	-.168	.531	-.115	-.188	.000	.000	.000
performance	.000	-.216	.000	.198	.000	.000	.667	-.847

Table 0-47: Standardized Direct Effects

The table below shows the indirect effect between the constructs of the research. The indirect effect of first aid on commitment via caring is positive but small. However, the indirect effect of

safety-heat on commitment via attitude is negative. The indirect effect of safety-heat on alienation via expectancy/self-efficacy is also negative. The indirect effect of safety-heat and self-efficacy has a positive influence on performance via the path of alienation. First aid practices have an indirect positive influence on performance through the path of caring and commitment.

	Safety-heat	First-Aid	attitude	Self-efficacy	expectancy	caring
attitude	.000	.000	.000	.000	.000	.000
Self-efficacy	.000	.000	.000	.000	.000	.000
expectancy	.000	.000	.000	.000	.000	.000
caring	-.034	.000	.000	.000	.000	.000
commitment	-.214	.045	.023	.000	.000	.000
Alienation	-.259	.000	.000	.000	.000	.000
performance	.284	.172	-.120	.097	-.032	.134

Table 0-48: Standardized Indirect Effects

Summary

The results indicate that the affective commitment is weakly but positively correlated with the OSHAD SF (PPE, first aid and safety in the heat). In particular, PPE is found not to be a significant predictor of affective commitment, while first aid and safety in the heat contribute to determining the affective commitment. In addition, the results also indicate that Absenteeism is weakly and negatively correlated with the overall OSHAD SF. In particular, PPE, First Aid and Safety in the Heat contributed to predicting Absenteeism.

Moreover, it is also found that Work Alienation has a moderate negative relationship with OSHAD SF and all three variables: PPE, First Aid and Safety in the Heat have been found to be good predictors for Work Alienation. Likewise, a moderate and positive correlation has been found between OSHAD SF and Job Satisfaction. In this regard all three OHS constructs, PPE, First Aid and Safety in the Heat have been found significant predictors of Job Satisfaction.

One of the most interesting findings has also been in the context of job performance and workers' personal traits (i.e. self-efficacy, outcome expectancy, actively caring behaviour, and attitude). It has been inferred that, among these traits, self-efficacy and actively caring behaviour have a high correlation with job satisfaction or performance as compared to outcome expectancy, while a weak and negative correlation was found between attitude and job satisfaction.

Finally, weak and negative correlation was found between OSHAD SF and Continuance Commitment; positive but weak correlation was found between OSHAD SF and Normative Commitment; and positive and moderate correlation was found between OSHAD SF and Organizational Commitment. The next chapter discusses these results with support from the literature review.

CHAPTER EIGHT: DISCUSSION ON THE ASSOCIATION BETWEEN THE VARIABLES

Introduction

This chapter is built on the foundation laid in Chapter Seven, which presented the results in order of each hypothesis and reported the statistical analyses. However, this chapter seeks to discuss in detail the results of each hypothesis in light of the research aim, research subject and review of the most relevant studies. The discussion presented below details the association of OSHAD SF with affective commitment, absenteeism, work alienation and job satisfaction, and the discussion details the association of worker's personality traits with job performance.

Discussion on the Association between OSHAD SF and Affective Commitment

The previous chapter analyzes the relationship between safety management and affective commitment. The correlation analysis of the study confirmed a moderately positive association between health and safety at work and affective commitment. It also shows by regression analysis that the OSH at work has a significant impact on affective commitment. Hypothesis testing also finds a positive relationship between OSHAD SF and Affective Commitment, which means that the score for Affective Commitment increases when OSHAD SF is implemented in the construction sector in Abu Dhabi (Table 8.1). Therefore, when employees have positive impressions of/views on the management of health and safety where they work, their emotional connection and identification with the organization improves (Kayank, Toklu, & Toklu, 2016).

Cluster	Measures	Unstandardized Beta	Sig.	Hypotheses Support (Yes, No, Partially)
OSHAD	PPE	0.048	0.351	No
	First Aid	0.109	0.037	Yes
	Safety in the Heat	0.147	0.004	Yes

Table 0-1: Summary of regression results between OSHAD and Affective Commitment

The result is in line with previous studies in the literature, which also found a positive correlation between a system of safety and health at work and affective commitment (Mohamed & Maraqa, 2013). It has been suggested that employees with a high level of emotional involvement demonstrate affective / emotional identification / participation in the organization and that these

employees are less likely to participate in absenteeism, poor performance and turnover behaviour (Jaros, 2007).

The results also show that there is a moderately positive relationship and that it has a significant impact on the concept of OSHAD management and the regulatory affective commitment of employees. It also confirms the findings in the literature that the health and safety of these employees must prevail, so that the administration can develop loyalty among employees, particularly those working in high-risk organizations. It has been suggested that an organization that incurs significant employment costs, such as worker safety and health education, can cause emotional commitment. Recognition of this form of employee investment can lead to unbalanced relationships and can make employees return by investing in the organization until the costs are paid (Sousa, Almeida, & Dias, 2015). It has been established also that legal obligations are an important factor in employee motivation (Koziol, Szkola, & Koziol, 2016). The more trust employees have in the work-place, the more committed and loyal they are to the organization and the rate of employee turnover is reduced. The results also show that there is a moderately positive and significant link between health and safety management and continuous engagement. As a result, the perception of health and safety managers in an organization can influence their decision to remain in the organization and make a positive contribution to it. When employees believe that managing the health and safety of an organization is appropriate and suitable, they are more likely to maintain ongoing relationships with the organization because they know that their safety and health are safeguarded in the business entity where they work (Haas & Yorrio, 2016).

it has also been indicated that where employees realize that their safety and health is in danger, they tend to demonstrate withdrawal behaviours such as absence from work and high turnover. This conclusion is in line with other important studies (Hanna & Awad, 2005) (Beesley, 2013) which shows that when workers are exposed to poor working conditions, such as excessive noise, insulting regulation, poor visibility and unhygienic circumstances, there is a decline in the consistent commitment of employees to the company. As a result, personnel trust that the overall total cost of continuing to work in their company outweighs the cost of terminating their employment. In other words, in order for loyal employees to work in risky and unsafe industries such as construction, an effective health and safety system is needed to protect workers. Theoretically, the results exhibited above confirm several theories of reciprocity, in particular, the

theory of social exchange, which suggests that social conduct is the result of an interchange procedure to exploit profits and reduce costs (Rajaprasad, Rao, & Chalapathi, 2013). Under this concept, individuals evaluate the possible advantages and potential hazards of societal relations. When the risk exceeds the reward, people end the relationship. The basic assumption of the theory is that people interact for value gain or expectation. Based on a fundamental desire to have guaranteed health and safety at work, employees evaluate their relationship with the organization and make informed decisions about whether to create emotional, lasting or regulated relationships with the organization.

In addition to the above debate, there are also suggestions for modeling mutual actions as behavioural responses to behaviours considered good or hostile. Actions are considered good or hostile and more prizes and penalties are awarded. When employees feel that their organization is not concerned about their health and safety, they are highly likely to display work conducts including absenteeism, an intention to leave the organization and weak organizational and affective commitment (Kayank, Toklu, & Toklu, 2016).

Discussion on the Association between OSHAD SF and Absenteeism

Table 8.2 illustrates the regression results of the OSHAD (independent) and Absenteeism (dependent) variables. The figures in the table determine a significant effect of OSHAD on Absenteeism by showing a positive and close relationship between them. The results strongly support the hypotheses as shown by the significance of the variables $P < 0.05$.

Table 0-2: Summary of regression results between OSHAD and Absenteeism

Cluster	Measures	Unstandardized Beta	Sig.	Hypotheses Support (Yes, No, Partially)
OSHAD	PPE	-0.745	0.000	Yes
	First Aid	-0.674	0.000	Yes
	Safety in the Heat	-0.663	0.000	Yes

The work environment includes concerns related to employees' physical safety and security, temperature and well-being, proper lighting systems, noise pollution and overall environmental problems. Failure to comply with one of these conditions can affect workers' health. It is often assumed that a specific work environment, especially in occupational medicine, allows marginal

workers to participate in work. The addition of new employees can lead to a greater degree of absence from work than minor workers are given. Improving working conditions can also cause unhealthy workers to prolong their working lives and be absent more frequently. The absence of workers is often seen as a combination mechanism, since it is assumed that greater participation leads to greater absence. A less rigorous view is that improving working conditions reduces the negative impact on the health of existing workers, which reduces absenteeism. Since the new marginal employees delay any change in the absence rate, the constitutive effect can partially compensate for this result. It seems significant to unlock these effects. In order to decrease the absenteeism rate among employees, it is highly important to improve and implement the health and safety work systems and this is considered the key in adding to the economic incentive (Li, 2015). Yet if an enhancement in the health and safety work environment is shown up by the decrease in the rate of absenteeism, this must be taken into consideration when planning to capitalize on the development of a health and safety work environment. It is significant to identify any work environment that leads to possible health and safety issues for employees.

Keeping in mind the results presented above and hypothesis testing, it is evident that the key objective is to improve health and safety in the work environment in order to minimize absenteeism (Table 7.9). It has been further suggested that this practice will prove to be highly useful not only for employees but also in the long run for organizations. The high absenteeism rate of employees appears to be a key representation of a company's standing and this can be used to examine the impact of work-place safety and health measures on employee health and productivity or absenteeism. For political purposes, it is significant to carry out an in-depth discussion on the work-place health and safety systems, worker absenteeism and their relative collective contribution to organizational performance overall (Jitwasinkul, Hadikusumo, & Memon, 2016). Because unfavorable working conditions can be associated with poor employee health, absenteeism can be reduced by improving the working conditions in terms of health and safety. These improvements cover a wide range of options, including the use of more advanced and safer machinery or more efficient assembly lines particularly in the construction industry in Abu Dhabi. Together, this can lead to an increase in productivity and a reduction in the frequency of absenteeism, although the implementation of these systems can prove very costly. Companies should also consider the contribution of psychological factors associated with the perception by an employee of the firm's occupational health and safety systems and the psychological response of

workers to precarious working conditions and stress. A higher workload and negative OSHAD SF perception in this situation can also lead to a higher incidence of illness due to stress, resulting in absenteeism. In this particular case, the construction industry specifically needs to pay more attention to this problem (Ghasemi, Mohammadfam, Soltanian, Mahmoudi, & Zarei, 2015). The efficient occupational health and safety work systems can make an individual employee more committed to work and thus reduce the chances of absenteeism. It has also been suggested (Beesley, 2013) that the health and safety work environment should be implemented and offered to individuals in an appropriate manner so that employees do not feel that the organization or employer ignores workers' health in allocating their jobs.

It has also been noted (Borman & Motowidlo, 1993) that occupational work and safety systems play an important role in the development of employee engagement and relationships at work, which directly affects the absenteeism rate. As a result, employee productivity can be increased depending on real improvements in health and safety work-place design and systems (Veltri, Pagell, Behm, & Das, 2007). Furthermore, it has been found that a prolonged absence from work by employees is extended if the construction companies have a past record of weak occupational health and safety initiatives. Although the evaluations cannot be interpreted as the effects of reflex cause, the results presented above show the importance of effectively implementing these systems. Thus, the results presented show a moderately negative relationship between OSHAD SF and absenteeism, which means that the score for absenteeism decreases when the OSHAD SF implemented in the construction sector in Abu Dhabi.

Discussion on the Association between OSHAD SF and Work Alienation

Table 8.3 illustrates the regression results of the OSHAD (independent) and Work Alienation variables. The results in the table show the significant effect of OSHAD on Work Alienation by showing a positive and close relationship between them. The results strongly support the hypotheses; the value of significance for all the variables is less than 0.05. This negative influence is in keeping with the existing literature.

Table 0-3: Summary of regression results between OSHAD and Work Alienation

Cluster	Measures	Unstandardized Beta	Sig.	Hypotheses Support (Yes, No, Partially)
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OSHAD	PPE	-0.816	0.000	Yes
	First Aid	-0.734	0.000	Yes
	Safety in the Heat	-0.654	0.000	Yes

In light of the results above, it is evident that bringing an unhealthy and unsafe work system to an end does not completely and significantly affect work alienation, however. Furthermore, it has been observed that security practices and risk management do not affect work alienation. Organizational safety and health practices or provisions are considered important and have a negative impact on the work of employees because they have a moderately negative correlation with work alienation. Furthermore, first aid and training have been observed to have a significant and positive effect on work alienation (Kayank, Toklu, & Toklu, 2016). Relevant studies have shown that organizational mechanisms (formalization) can be positively associated with alienation because policies and procedures limit the control and personal abilities of employees. Safety is an important factor to incorporate and implement in the organizational setting. Regardless of the product or other system features, user safety should not be compromised. Of course, some products are inherently dangerous, but the prevention of risk strategies and safety tactics needs to be in place to ensure the prevention of work alienation in the future. In addition, it has been suggested that the amount of loss caused by normal work accidents per year is greater than the amount caused by other factors (Alarcóna, Acuña, Diethelm, & Pellicer, 2016).

Apart from the fact that security is the cornerstone of human practice in the construction industry specifically, it is beset with practical problems. Each workstation has unique attributes that provide a common solution to all security issues. Furthermore, some work variables such as training, work experience and protective clothing make some dangerous tasks less risky, in certain industrial environments such as the construction industry, than in other industrial environments. With the absence of a proper occupational health and safety system in the organization, more and more people feel alienated from the work-place. The destruction of close and supportive relationships between people and their organizations can lead to dangerous situations, such as: sabotage or abandonment. All individuals have other interests and activities that are sometimes more subjective than their daily work (Lutchman, Rohanie, & Waddah, 2012). Construction companies can reduce the alienation due to OHS through active consultation systems, open policies, formal

complaints and opposition procedures, as well as other behavioural motivation tools. Working conditions can lead to negative emotions in institutions and individuals. Alienation reduces the enthusiasm of employees, leads to their mental deviation from their work and reduces their participation in it.

Furthermore, the dissatisfaction of employees can lead to low commitment, absence from work, low productivity, aggressiveness to people and groups, and fatigue (Yorio, Willmer, & Moore, 2015). Finally, there is separation from work due to job losses and work satisfaction, low productivity, low motivation, high work tension, low levels of organizational and work loyalty, high levels of job loss and relaxation, job satisfaction and operations. As indicated in the literature review, work alienation refers to a negative perception in people that stops them from offering desirable and expected behaviour. In summary, exclusion from employment or work alienation occurs in situations in which people cannot directly control events and believe that they cannot interfere with them. If the organization's strategies and management are continuously shifting, technologies are continually altering and making new circumstances, personnel make the choices they have to face, but workers cannot familiarize themselves by practical understanding as work requests alter and administrative staff must communicate more (Zhou, Goh, & Li, 2015). According to the results of this study, a stronger insight into weak occupational health and safety systems statistically reduces the work alienation of the research participants.

Thus, it is suggested that construction industry managers in particular should try to prevent the alienation of personnel by improving the occupational health and safety of the organization. The signs of work alienation include poor work quality, performance, collaboration, enthusiasm, organizational obligation, together with lower participation in work, lack of work, work stoppages, job switching and other adverse effects. To avoid these types of negative situation in an organization caused by poor leadership in occupational health and safety matters, the factors that lead to disrupted organizational safety and the necessary precautions against them must be identified to ensure a healthy and safe work environment. Thus, the discussion presented above clearly supports the results exhibited in earlier that there exists a moderately negative relationship between OSHAD SF and Work Alienation, which means that the score for Work Alienation decreases when OSHAD SF is implemented in the construction sector in Abu Dhabi.

Discussion on the Association between OSHAD SF and Job Performance

Table 8.4 illustrates the regression results for the summary results of the OSHAD (independent) and Job Performance variables. The figures in the table show that there is a significant positive effect of OSHAD on job performance. The results strongly support the hypotheses since the value of significance for all the variables is less than 0.05.

Cluster	Measures	Unstandardized Beta	Sig.	Hypotheses Support (Yes, No, Partially)
OSHAD	PPE	0.311	0.000	Yes
	First Aid	0.337	0.000	Yes
	Safety in the Heat	0.362	0.000	Yes

Table 0-4: Summary of regression results between OSHAD and Job Performance

Keeping in mind the results exhibited above, it is evident that a safe and healthy job environment has a constructive impact on staff performance. Unsafe and unhealthy working settings restrict the ability of employees to reach their maximum potential (Table 7.21). Therefore, companies should be aware of the importance of maintaining and implementing a safe work environment. A healthy and safe work setting has a significant correlation and association with employees' job performance. Conversely, an unsafe and unhealthy working environment limits the ability of employees to reach their full potential. Moreover, it has insignificant correlation and association with employees' job performance. Therefore, companies should be aware of the importance of a healthy and safe work setting. Also, it has been suggested that workers who contribute good job performance consider safety to be the key underlying reason and work more efficiently, so the frequency of accidents is relatively low (Marks & Shen, 2016).

In contrast, dissatisfied work partners and colleagues who have a negative attitude to security and safety in the environment, exhibit and perceive low organizational obligations and security procedures and experience more accidents. As expected, employees who express greater job performance also qualify the security environment positively, whereas dissatisfied workers have a negative point of view. In fact, employees' perceptions of safety at work seem to reflect the extent to which they feel supported by their organization and its commitment to their well-being and performance. This observation strengthens past performance in terms of job performance, a

phenomenon that is influenced by several contextual factors in this occupational health and safety system, which itself is a further key part of the overall organizational climate. In this case, the security climate is part of the organizational climate. One of the studies in this regard created a job performance model by incorporating business variables and the health and safety work environment to examine employee responses to a highly profitable and secure work environment and poor performance in an unsafe work environment. Studies have shown that different variables of social and work-place psychology, and social support in the work-place, have an immediate impact on job performance and higher pay is not known to lead to an increase in employee dissatisfaction (Jilcha & Kitaw, 2016).

Furthermore, the availability of managers on demand, the ability to communicate with employees, knowledge of creative thinking, openness to employees, the capacity to interconnect with personnel and most importantly a safe working environment are key to job performance. The results show that with appropriate and efficient supervision, employee performance is higher, social security is low and employee performance is higher. The employees of the construction industry in Abu Dhabi specifically believe that the work-place plays a crucial role in determining job performance. With increasing competition and the dynamics and challenges of the corporate environment, different organizations must ensure that their workforce works in a friendly and supportive work environment because this alone will maximize their work potential. Employees have now begun to focus more on their environment, including its working hours, safety and health provision, relationships with colleagues, respect for necessities and for top management. A healthy and safe work environment can increase loyalty, commitment, efficiency, efficiency, productivity and employee participation, ultimately increasing organizational efficiency and reducing the cost of bans traceable to employee dissatisfaction. Naturally, job satisfaction does not arise in a vacuum, i.e. workers who are satisfied or dissatisfied with the job are motivated or frustrated by the current organizational climate. As expected, satisfied employees are more in line with the safety management policy, as indicated in the results presented in the sections above and the results of previous studies (Gholami, Nassiri, Yarahmadi, Hamidi, & Mirkazemi, 2015). This observation is consistent with the employees' belief that safety comes from compliance with safety regulations. This is clearly a satisfying opportunity for workers to respond to the implicit commitment of the employer, since they are positive signs of management's concerns about their

well-being. Current observations further reinforce the theory of social exchange and reciprocity criteria as the basis of employees' safety behaviour.

From the results presented above it is evident that the interventions aimed at demonstrating organizational support and awareness of the well-being and satisfaction of employees not only increase the efficiency and productivity of the organization, but also reduce the frequency of accidents and thereby reduce the high costs of work, just as they reduce the social costs of accidents (Zahoor, Chan, Utama, & Gao, 2015). The literature on the organization's job performance is full of organizational structures that have a positive impact on the well-being of employees, supporting and demonstrating the commitment of employees beyond the formal requirements of contractual agreements, the implementation of equity, the development of expensive programs and the guarantee of job security. Thus, the entire mix of discussion supports the results which suggest that a moderately positive relationship exists between OSHAD SF and Job Performance, which means that the score for Job Performance increases when the OSHAD SF is implemented in the construction sector in Abu Dhabi.

Discussion on the Association between Workers' Personal Traits and Job Performance

Table 8.5 illustrates the regression summary results of the Personal Traits (independent) and Job Performance variables. The figures in the table determine a significant effect of Personal Traits i.e. Self-Efficacy and Actively Caring Behaviour on job performance by showing a positive and close relationship between them. The results strongly support the hypotheses since the value of significance for these variables is less than 0.05. However, Personal Traits such as Outcome Expectancy and Attitude to Job performance have no significant effect. The following table shows either no relationship between them or one that is weak. The results do not support the hypotheses because the value of significance for these variables is greater than 0.05.

Cluster	Measures	Unstandardized Beta	Sig.	Hypotheses Support (Yes, No, Partially)
	Self-Efficacy	0.199	0.000	Yes

Personal Traits	Outcome Expectancy	0.048	0.251	No
	Actively Caring Behaviour	0.336	0.000	Yes
	Attitude	-0.11	0.764	No

Table 0-5: Summary of regression results between Personal Traits and Job Performance

In light of these results, it is clear that the hypothesis of a significant positive association between self-efficacy and job performance is supported. This confirms the general positive association between self-efficacy and job performance found in the literature. Self-efficacy affects one's emotional responses and thought patterns. It has also been suggested that self-efficacy can be described as a function of self-confidence in being able to perform a task (Hysong & Quitnones, 1997). Therefore, it can be stated that a high degree of self-efficacy will lead to an increase in the productivity and performance of employees in the work-place. Compared to other motivational structures, self-efficacy has shown itself to be a good predictor of behaviour, especially in the areas of psychology and education.

Other than this, the results presented above also exhibit the relationship between attitude as a personality trait and job performance. From the results reported in the section above, it is evident that a negative and weak relationship can be found between job performance and attitude. With this in mind, this sort of association also implies that a slight decrease in the score of attitude affects workers' job performance (Jiang & Wong, 2016). To elaborate this association and relationship, it has been indicated that attitude is also linked to participation in one's career and job and so it can be a predictor of an individual's job performance. People with an opportunity to get involved in a career will always try to improve their skills and motivate themselves to attain positive work performance results. These employees prove to have a better sense of job responsibility; they find time to develop their skills and improve their self-efficacy and caring behaviour. There is ample evidence of the importance of employee trust and productivity, including the ability to adapt to advanced work technologies, such as the use of heavy equipment, specifically machinery in the construction industry, to respond to current changes in career planning, to develop new ideas and new leadership skills, such as developing teams, and performing better (Awwad, El Souki, & Jabbour, 2016).

A number of studies have examined the impact of self-efficacy, attitude, caring behaviour and outcome expectancy on job performance, but few have investigated the overall impact of these on employee performance and the factors that previously linked efficiency to efficacy. Previous studies have shown that self-efficacy and attitude are part of productivity and, unlike outcome expectancy and caring behaviour, contribute to improving the quality of service and efficiency in the work-place. The arguments that support the relationship of attitude and self-efficacy to job performance translate into work efficiencies that are generally related to the function of connection as a guide and tool. In addition to the information that has been provided in the results section and the present discussion, it has also been argued that attitudes to work have been shown to have a positive effect on work productivity (Battaglia, Passetti, & Frey, 2015).

Other than this, it has been reported that attitude can have a serious impact on a person's work habits and thus overall job performance. Employees with a positive occupational attitude work in a completely different way than employees with a negative occupational attitude. Thus, considering the trend of the above discussion, it is evident that a positive and moderate relationship links job performance and self-efficacy with actively caring behaviour, which further implies that the increase in self-efficacy and actively caring behaviour moderately improves job performance. At the same time the discussion also maintains that a positive but weak relationship links job performance with outcome expectancy. This further implies that a very small increase in the score of outcome expectancy slightly improves job performance (Ibarrondo-Dávila, López-Alonso, & Rubio-Gámez, 2015). In addition, the discussion above also supports the view that a negative and weak relationship exists between job performance and attitude, which implies that a slight decrease in the score of attitude affects workers' job performance.

Discussion on the results from path analysis

The objective of this section is to review and discuss the essential objectives of this study: to investigate the relationship between occupational health and safety management system and performance. To this end, this section will test the associations presented in Chapter Four (on the conceptual framework). This research used structural modeling, the results of which are presented below.

Discussion on the results from the structural model of health and safety and personal traits

A summary of the results is shown in the table below. This subsection addresses the association between OSHAD practices and site workers' personal traits. The hypothesis concerns whether workers' behaviour is affected or influenced by OSHAD practices. The hypothesis is tested using SEM methods. The discussion in this section then turns to the literature regarding the relationship between the soft or cognitive side of site workers and the technical or hard side of HSE practices. One of the reasons for writing this was the lack of studies that address the influence of HSE practices on workers' behaviour in the UAE. Beginning with the first aid practices, the findings showed that these had an insignificant influence of workers' self-efficacy and expectancy. However, the results revealed that first aid has a significant positive effect on caring traits with a standard regression weight of 0.207. These results are in line with previous studies which indicated that personal traits had an impact on job performance (Dhani & Sharma, 2017).

			Estimate	P	Hypothesis
Self-efficacy	<---	First-Aid	.209	.133	Not supported
expectancy	<---	First-Aid	-.045	.443	Not supported
caring	<---	First-Aid	.207	***	Supported
Self-efficacy	<---	Safety-heat	.432	***	Supported
expectancy	<---	Safety-heat	.265	***	Supported
attitude	<---	Safety-heat	-.299	***	Supported

Table 0-6: Structural model of health and safety in relation to personal traits

The second HSE practice (safety in the heat) was found to have a positive significant effect on self-efficacy and outcome expectancy/self-awareness traits. These results are in keeping with the existing literature, which has shown a positive relationship between these traits and OSH practices (Hysong & Quitnones, 1997), (Silvia, 2001), and (Duval, 1972).

The results also confirmed that the practice of and attitude to safety in the heat are negatively associated. That is to say, safety in the heat practices negatively influence the attitude of site workers. This finding is not consistent with the existing literature which shows that 'constructive' attitudes are among the most critical indices of the effectiveness of a safety culture (Cox & Cox, 1991). But this incoherence may be due to practices being in different countries or job settings.

Discussion on the results from the structural model of HSE, personal traits and organizational commitment

This model addresses the mediating effect of personality traits on the relationship between organizational commitment and HSE practices. The summary of the model results is shown in the table below. The results are all significant at $P < 0.001$.

It was decided to investigate whether any of the personality traits mediating the independent variables (first aid and safety in the heat) was likely to have a significant effect on the mediators (attitude, expectancy and self-efficacy). The results shown below demonstrate that this was the case. The mediators (attitude, expectancy and self-efficacy) must also have a significant effect on the dependent variable (commitment, alienation). This was also tested as shown in the table below. In the current study, there was no significant relationship between commitment and OSHAD practices. However, with the introduction of personality traits the direct relationship between commitment and safety in the heat became significant and positive. This result is in line with the literature that indicates three positive influences of HSE on commitment. The direct relationship between the OSHAD practices and alienation was negatively significant. The introduction of the personality traits increased the strength of this relationship. This result supports the view that personality traits provide partial mediation for commitment and alienation. This is also in keeping with the existing studies. Studies have shown that commitment is positively related to trust in one's safety (Mayfield & Mayfield, 2002), (Hartmann & Bambacas, 2000). Similarly, previous research indicates that alienation is negatively related to safety (Hirschfeld & Field, 2000).

			Estimate	P	Hypothesis
caring	<---	First-Aid	.197	***	Supported
attitude	<---	Safety-heat	-.299	***	Supported
expectancy	<---	Safety-heat	.231	***	Supported
Self-efficacy	<---	Safety-heat	.494	***	Supported
Alienation	<---	expectancy	-.188	***	Supported
commitment	<---	expectancy	-.298	***	Supported
Alienation	<---	Self-efficacy	-.118	***	Supported
commitment	<---	attitude	.485	***	Supported
Alienation	<---	attitude	.529	***	Supported
Alienation	<---	First-Aid	-.167	***	Supported
commitment	<---	caring	.181	***	Supported

	Estimate	P	Hypothesis
commitment <--- Safety-heat	.173	***	Supported

Discussion on the results from the structural model of OSHAD, personal traits organizational commitment and performance

This model brings together the relationship between all the study variables. All the influences in the model are significant, as shown in the table below.

The results from the model are in accordance with prior arguments that suggest that workers' performance is negatively associated with alienation and positively associated with commitment (Mayfield & Mayfield, 2002), (Hartmann & Bambacas, 2000), (Hirschfeld & Field, 2000). Both alienation and commitment have a high standard regressions weight. First aid was found to influence work alienation. This confirms the findings from the literature. Safety in the heat was also found to impact on commitment and performance in a positive manner. This is also in line with the existing literature. This may demonstrate that construction workers view commitment as an endorsement of organizational support. It is well documented that workers with a positive perception of support repay this with greater loyalty and affective commitment. The support of first aid is positively related to several personality traits. This could be explained by the fact that workers may consider such non-financial benefits as good -will gestures forming in their minds a positive attitude to organizational support. Work alienation was found significantly and negatively associated with job performance. This is also consistent with the literature. All studies demonstrated that there was a negative association between work alienation and workers' performance. This may stem from the fact that alienation is assumed to relate to disruption in workers' attitude. That is to say, when workers feel alienated from their daily jobs, this negatively influences their effort and output.

	Estimate	P	Hypothesis
attitude <--- Safety-heat	-.299	***	Supported
caring <--- First-Aid	.223	***	Supported
expectancy <--- Safety-heat	.231	***	Supported
Self-efficacy <--- Safety-heat	.495	***	Supported
caring <--- attitude	.114	.017*	Supported
Alienation <--- expectancy	-.188	***	Supported
commitment <--- expectancy	-.287	***	Supported

			Estimate	P	Hypothesis
Alienation	<---	Self-efficacy	-.115	***	Supported
commitment	<---	attitude	.472	***	Supported
Alienation	<---	attitude	.531	***	Supported
Alienation	<---	First-Aid	-.168	***	Supported
commitment	<---	caring	.200	***	Supported
commitment	<---	Safety-heat	.164	***	Supported
performance	<---	commitment	.667	***	Supported
performance	<---	Alienation	-.847	***	Supported
performance	<---	Self-efficacy	.198	***	Supported
performance	<---	First-Aid	-.216	***	Supported

Summary

On the basis of the discussion above, it is evident that when employees have positive impressions of/views on the management of health and safety in their work-place, their emotional connection and identification with the organization is enhanced. The discussion also indicated that improving working conditions reduces the negative impact on the health of existing workers, which reduces absenteeism. Organizational safety and health practices or provisions are also considered important and have a negative impact on the work of employees because it has a moderately negative correlation with work alienation. Moreover, a healthy and safe work setting has a significant correlation and association with staff's job performance and self-efficacy as a key personality trait affects one's emotional responses and thought patterns.

CHAPTER NINE: CONCLUSIONS AND FURTHER RECOMMENDATIONS

Introduction

Chapter Eight discussed and summarized the major findings of the research. This chapter briefly presents the conclusions drawn and outlines the researcher's own views about the strengths and weaknesses of the research approach. The chapter includes also an assessment of the contribution to knowledge made by the research and some recommendations for future studies.

Summary of findings and main conclusions

As elaborated in the first chapter, the main objective of the research has been to evaluate the impact of applying OSHAD SF to the performance of workers in the construction sector in Abu Dhabi. This was done by identifying the relevant literature and reviewing it in Chapters Two and Three, linking and evaluating theories in Chapters Four and Five, analyzing and evaluating the data in Chapters Six and Seven, and finally reporting the results in Chapter Eight.

The research was designed to meet a specific research aim and objectives. A review of the relevant literature led to the discovery of a relationship between implementing an OSH management system and the performance of the workers. More specifically, the research focused on evaluating the impact of implementing OSHAD SF which is the OSH management system implemented in the construction industry of the Emirate of Abu Dhabi since 2010.

Further data for this research was collected by means of a primary tool. A survey questionnaire was distributed to workers in the construction sector in Abu Dhabi. The results of the research were evaluated and studied in Chapters Six and Seven through descriptive and ranking analysis, regression and correlation analysis. The hypotheses of the study and the association of OSHAD SF with performance (shown by affective commitment, absenteeism, work alienation, and job performance) were discussed in Chapter Eight. The chapter also covered the association of workers' personality traits and job performance.

Achievement of the research aims and objectives

The objectives of the research were to:

- **Objective 1:** Investigate the current status of the occupational health and safety management system (OSHAD SF) in the construction industry in Abu Dhabi.
- **Objective 2:** Examine the level of understanding of OSHAD guidelines and framework among the workers in the construction companies of Abu Dhabi
- **Objective 3:** Investigate the effect of OSHAD SF on workers' performance in the construction sector
- **Objective 4:** Find the relationship between the personal traits of workers in the construction sector in Abu Dhabi, organizational commitment, and job performance.

No	Dependent variable	Independent variable	Group	Sub- hypothesis 1	Sub- hypothesis 2	Sub- hypothesis 3
Hypothesis 1	affective commitment	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment PPE & affective commitment	first aid & affective commitment	safety in the heat & affective commitment
Hypothesis 2	absenteeism	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment PPE & absenteeism	first aid & absenteeism	safety in the heat & absenteeism
Hypothesis 3	Work alienation	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment PPE & work alienation	first aid & work alienation	safety in the heat & Work alienation
Hypothesis 4	job performance	OSHAD SF	construction sector in Abu Dhabi	personal protective equipment PPE & job performance	first aid & job performance	safety in the heat & job performance

Fulfilment of the first objective

The first objective of the research was to investigate the current status of the occupational health and safety management system (OSHAD SF) in the construction industry in Abu Dhabi. To this end, OSHAD SF was reviewed in detail. Before going into details about the OSHAD SF, a review of the OSH legislation worldwide cited the UK, the USA, Singapore, and Qatar. After this the research covered the OSH laws and regulation in UAE in detail and, more specifically, the Ministry

of Labour's Law No. 8 for the year 1980. Finally, the OSH legislation in Abu Dhabi (OSHAD SF) was examined. The research in Chapter Two covered OSHAD SF in depth as a regulatory tool that involved 54 codes of practice for workers in the performance of their duties in all sectors. In the literature, various key features of EHSMS and the EHS committee for the B&C sector were identified to determine the areas that had to be considered for the security of workers in Abu Dhabi's construction industry (AD EHSMS, 2012). The same chapter (Chapter Two) also analysed the main components of the OSHAD SF which are presented separately in the Appendix, below. In completing this objective this study started from the following premises:

- 1- The construction industry is thought to be one of the riskiest industries.
- 2- OSHAD SF is a management framework developed by the government of Abu Dhabi and implemented in the different sectors of the Emirate.
- 3- OSHAD is the government entity which is responsible for implementing the OSH management system. It has to develop regulations and requirements as well as implementing the required awareness at all levels.

Fulfilment of the second objective

The second objective of the research was to examine the level of understanding of the OSHAD guidelines and framework among the workers in the construction companies in Abu Dhabi

To achieve this objective, an exploratory survey using a questionnaire was conducted. This survey was needed because no empirical studies had hitherto been made in this context, and it was necessary to check on the state of OSH practices in construction companies. It also supported a rough idea of the current status of the status of OSH in this sector.

To gauge the level of commitment to observing OSHAD SF and implementing H&S on construction sites, 15 quantitative questions were put to construction companies about their compliance with the provisions of OSHAD SF; they were divided into three main sections, namely, PPE, First Aid, and safety in the heat.

Chapter Six reported a descriptive analysis of H&S implementation on construction sites. The results showed that there is a high level of awareness among workers of the three areas of OSH practices, standards, and requirements. In completing this objective as far as the three main CoPs are concerned this study concludes that:

- 1- The results show a good understating and awareness of OSH requirements among workers in the construction industry.

Fulfilment of the third objective

The third objective of the research was to investigate the effect of OSHAD SF on workers' performance in the construction sector. To this end a detailed review of the previous literature was conducted. This research covered six performance indicators, namely, affective commitment, continuance commitment, normative commitment, organizational commitment, absenteeism, and work alienation, together with three main OSHAD SF CoPs: PPE, first aid, and safety in the heat. The relationship between performance and implementing OSH management system had been outlined in Chapter Three, referring to the claim in previous studies that a close relationship exists between OSH and workers' performance; they perform well as long as they are provided with a good working environment and culture. Therefore, organizational safety and health practices should be a key focus of construction companies.

To elaborate the above and further clarify the effect of OSHAS SF on construction companies in Abu Dhabi, a questionnaire was distributed to investigate the effect of implementing OSHAD SF on workers' performance. The survey was divided into several sections, two of them focusing on performance and OSHAD SF.

The one focusing on performance had seven sections, namely, affective commitment (AC), continuance commitment (CC), normative commitment (NC), organizational commitment (OC), absenteeism (AB), and work alienation (WA). This section comprised 46 questions.

The data were given statistical tests (correlation analysis, regression analysis, and structural modeling using AMOS) and the results and illustrative charts were given in Chapter Seven.

An summary of the relationship between the two variables (OSHAD SF and performance) are presented in the table below.

	Affective commitment	Absenteeism	Work alienation
OSHAD SF	Positive	Negative	Negative

PPE	Correlation is positive but weak Regression: Hypothesis cannot be accepted	Correlation is moderately negative Regression: Hypothesis cannot be rejected	Correlation is moderate weak negative Regression: Hypothesis cannot be rejected
FIRST AID	Correlation is positive but weak Regression: Hypothesis cannot be rejected	Correlation is moderate and weakly negative Regression: Hypothesis cannot be rejected	Correlation is moderate and weakly negative Regression: Hypothesis cannot be rejected
SAFETY IN THE HEAT	Correlation is positive but weak Regression: Hypothesis cannot be rejected	Correlation is weak and moderately negative Regression: Hypothesis cannot be rejected	Correlation is weak and moderately negative Regression: Hypothesis cannot be rejected

Table 0-1: Relationships between OSHAD SF and performance

In completing this objective this study concluded the following:

- 1- Implementing OSHAD SF in the construction industry affected workers' commitment positively. This result is matched those in previous studies.
- 2- Implementing OSHAD SF in the construction industry negatively affected workers' absenteeism and work alienation. These results matching those of previous studies. This

means that when workers realize how much effort is spent by companies on OSH, absenteeism and alienation average go down.

Fulfilment of the fourth objective

The fourth objective of the research was to find the relationship between the personal traits of workers in the construction sector in Abu Dhabi, organizational commitment, and job performance.

This study showed the significant effect of Personal Traits (Self-Efficacy and Actively Caring Behaviour) on job performance, finding a positive and close relationship between them. At the same time, the personal traits of Outcome Expectancy and Attitude had no significant effect on job performance. Employees with a positive occupational attitude work in a completely different way than employees with a negative occupational attitude. This suggests, keeping in mind the trend of the discussion, that a positive but moderate relationship links job performance, self-efficacy, and actively caring behaviour. This further implies that any increase in self-efficacy and actively caring behaviour moderately improves job performance.

In completing this objective this study establishes the following:

- 1- Personal traits interact differently than organizational commitment and job performance
- 2- Some traits have a positive relationship with commitment and performance while others have a negative relationship.

Implications

Throughout this research, the influence of OSH practices – PPE, first aid and safety in the heat – on workers' performance was investigated, as were the relationships between OSH practices and performance indicators: affective commitment, absenteeism, and work alienation. This research has contributed to our understanding of OSH governance. The research findings and conclusions suggest the following implications for enhancing the implementation of OSH in the construction sector:

Workers

Workers should understand the way in which OSH practices can affect their performance through considering the following:

- Proper implementation of health and safety practices gives increased worker satisfaction, leading to better productivity and profitability. This creates an atmosphere of loyalty to the

employer. Hence, companies need to provide training programs to develop the required knowledge and capacities they need to perform their work safely matter

- Construction organizations ought to increase their investment in health and safety practices and workers' well-being, which will be reflected in workers' commitment, happiness and performance. As the social exchange theory holds, workers tend to feel more committed to the work, and more willing to perform better in the work-place when they feel that the organization appreciates their efforts.
- Companies should improve their performance and develop strategies to lower the turnover of workers because of bad OSH practices. Absenteeism, too, was found to negatively influence both performance and OSH implementation.
- Construction companies ought to build a culture of health and safety by involving workers in the decision making about their safety needs, since they are most aware of job requirements. The result for organizations is that they will create an atmosphere where workers are healthy, safe and feel connected with the company's business.
- Channels of communications between workers and government authorities should be opened to develop strategies for social support in and outside the work-place. These channels should be up to standard and focus on trust and confidence between all the parties.

For supervisors and managers

Supervisors and managers should implement an occupational health and safety management system and support government authorities in attaining their goal of implementing this management system, through the following:

- Job performance is mediated by organizational commitment. Thus, site managers need to devise systems of organizational commitment to implementing OHS and improving workers' performance.
- OHS needs to be considered as part of the attempt to raise productivity.
- The role of PPE in creating a safe work environment is to secure high commitment from the workers; hence, managers should invest more in PPE programs

- Management should enhance its communication with workers and develop channels to suit workers at different levels and in various work locations. It should also show support and understanding for workers.

For construction companies

Construction companies should contribute to the development of standards and safety practices in this sector through:

- Designing site jobs or tasks that take workers' views on OHS into consideration. . Workers who have little control over their work are more likely to leave a firm.
- Reviewing standards related to safety in the construction sector.
- Devising effective PPE awareness campaigns for the sector.
- Developing better schemes of social support and health insurance
- Developing strategies for managing overtime and the number of hours worked, to reduce accidents and improve turnover rates.
- Regarding OHS as a part of their performance goal.
- Trying to change the attitude to safety behaviour at the organizational level
- Applying a recruitment system based on personal traits and the attitude to OHS
- Assigning a budget for training and develop resources competencies.

For OSHAD policies

The findings from this research throw up several implications for OSHAD policy formation:

- The clear presentation of OSHAD policies, safety programs, and constant management support is important for maintaining positive attitudes to OHS implementation
- A clear vision and strategies for OSH implementation in the Emirate of Abu Dhabi should be published and promulgated.
- Monitoring and benchmarking are needed to raise performance standards. OSHAD should check the best international and national best practices, giving special attention to the common principles related to safety and inspection at work-place.
- Activities to change the culture should be promoted. Activities aimed at sharing experiences across all the sectors in the Emirate should be developed

- Campaigns to reduce shared risks should be launched.
- Effective legal frameworks should be established and standards developed across all the construction sectors and other sectors in the Emirate.
- A recruitment scheme, based on personal traits and agreed academic competencies should be developed as a prerequisite, with a common training course and CPD program for managers and supervisors.

Government of Abu Dhabi (Abu Dhabi Executive Council - EC)

Every country has in theory its own legislated OSH regulations to protect the workforce. These regulations mandate companies to implement systems for managing the work environment. Even so, more effort is required to reduce the occupational hazards on construction sites. Thus, the government of Abu Dhabi can further support OSHAD through:

- Clarifying the vision and strategy for government authorities
- Creating and mandating the powers of a competent authority and inspectors. The absence of clear and legal roles and powers limits effectiveness and puts the consistency of the system at risk.
- Supporting OSHAD decisions and ensuring that regulatory decision-making is consistent.
- Providing adequate resources at the level of operation required in this field.
- Aligning government organizations, policies and practices to deliver the vision and transferring OSHAD experiences to other entities.

Such experiences set an example of quality, sustainability and other benefits to any management system. As a suggestion, the government of Abu Dhabi could implement a quality management system to all government bodies and assign one of the main government bodies to monitor the system and send reports to the EC.

Contribution to knowledge

The findings of this research contribute to knowledge in the following areas:

- First, it has evaluated the current OSH situation in construction companies in some depth. This understanding will support the regulatory body by suggesting an implementation which enhances regulation and planning. The research has also helped to assess the level of understanding of OSHAD SF among companies. Its survey has shown a good level of understanding and adoption of the system CoPs. From the above, it is clear that the

regulatory body in Abu Dhabi is doing what is required to raise awareness and enhance knowledge on occupational health and safety management among construction companies.

- Second, it has shown the relationship between OSHAD SF and workers' performance in construction companies.
- Third, it has revealed the personal traits of workers in construction companies in Abu Dhabi. This makes it easier for the owners and supervisors of the companies to deal with their workers and choose the right person for the right post. The companies can control the recruitment process by developing tests that show every candidate's personal traits.

Limitations of the study

One of the main limitations of this study is that it focuses on construction workers, including managers, supervisors and labourers. However, due to the difficulty of accessing the third group when most workers speak no English and have a low level of education, the study drew much of its material from managers and supervisors.

Another limitation is that the study was conducted on the construction sector in Abu Dhabi alone. Therefore, future research is recommended to cover other sectors and thereby to investigate the impact of OSHAD SF on workers in other industries.

Third, the participation of companies (and individuals) in the study was voluntary. Companies were informed of the study's aims and objectives. An inherent problem in research of this nature is the possibility of that the companies who choose to participate represent only the 'best' end of the OSH scale.

Recommendations for further research

To sum up, further research into safety risks in Abu Dhabi's construction industry is required. Increasing the number of studies that investigate the activities in this important sector will provide a larger database and, it is hoped, further validate the findings of this study.

A similar study could be conducted in another sector in Abu Dhabi. The OSHAD SF is implemented in all sectors in Abu Dhabi, including industry, health, food, tourism, waste management, and others.

Finally, it is suggested a recruitment framework should be developed that includes a test for workers which gives some idea of their personal traits.

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Appendices

Appendix I: Titles and a description of OSHAD CoPs

CoP #	Title	Description	Related to Construction
1.0	Hazardous Materials	CoP 1.0 mainly focuses on the management of dangerous materials and the appropriate steps that should be taken in importing, storing or using such materials.	YES
1.1	Management of Asbestos Containing Materials	<p>Asbestos Containing Materials (ACMs) refers to a group of fibrous minerals that over time have been mined, refined and eventually turned into various materials that are used in construction and building. Since November 2006, the use of ACM has been banned all over the UAE, as elsewhere in the world. However, it is possible to find buildings erected in the past that could contain ACMs.</p> <p>It is also possible, as has been claimed from existing evidence, that ACMs have been used in construction buildings as late as 2014.</p> <p>The Duty Holder according to the CoP 1.10 has been identified as the person who has control of a building. It defines them by making it clear that:</p> <ul style="list-style-type: none"> Whether one controls non-domestic premises through tenancy or contract ownership, the duty holder, with regard to a multiple premises that have been tenanted, will be the one who owns or controls the building inclusive of both the access and the egress. <p>Other roles of duty holders according to the CoP entail ensuring that all buildings under their control have been through a survey by an Asbestos Supervising Consultant (ASC) who is competent to identify any use of ACMs or any areas that might contain Asbestos.</p> <p>As part of its survey, the ASC is required to develop a plan that is referred to as the Asbestos Management Plan (AMP). It ensures that any risk of Asbestos exposure is both controlled and managed. The other parts of the plan should consider ways of removing the existing asbestos, as well as requirements for asbestos which is not removed.</p>	NO

CoP #	Title	Description	Related to Construction
		<p>Due to the nature of asbestos and the risk associated with it, anyone charged with the responsibility of removing it should be a registered technician of Qudoart who is also very competent as a specialist in the field.</p> <p>To identify the presence of Asbestos Containing Materials, one should conduct a survey on three levels:</p> <ul style="list-style-type: none"> • Level 1 is a presumptive level which involves the location and assessment of asbestos through non-invasive tests on the material. • Level2, also referred to as the sampling survey, is a more detailed kind of survey that entails standard sampling, identification and assessment of the materials to find if they contain asbestos. • Level 3 is the most comprehensive, entailing full sampling through pre-demolition or major refurbishment. 	
1.2	Lead Exposure Management	<p>This is the CoP that outlines the requirements as well as the control measures that should be put in place to make sure that the risks that come with lead exposure have been minimized, and that control measures have been implementation in accordance with the hierarchy of controls. It also ensures that injuries, illnesses and diseases to people exposed to the kind of risks that emanates from the previously mentioned activities are prevented.</p> <p>This is also the CoP that covers the every worksite that could contain airborne lead at any level. The various worksites where these might happen include those where manufacturing, construction, maintenance, painting, and surface-preparation, sandblasting, and recycling take place, among others.</p>	NO

CoP #	Title	Description	Related to Construction
2.0	Personal Protective Equipment	<p>Within the glossary of terms, PPE is referred to as <i>any device, equipment or appliance – clothing or sunscreen – that is used to afford protection against unfriendly weather conditions though being either worn or held by an individual with the aim of protecting themselves against a single or even numerous health as well as safety hazards, so as to minimize their exposure to the risks that are associated with their work-place. These items include eye protection, facemasks and respirators, coveralls, high visibility clothing, helmets, goggles, gloves, protective footwear and gloves, among others.</i></p> <p>It is however important to note that this CoP does not refer to clothing that is worn as everyday corporate wear intended to maintain a corporate image for the organization that one works for. However any kind of clothing that is offered as protective gear against any kind of risk is considered to be covered under the PPE, and is therefore covered under these requirements.</p> <p>It also dictates that before employers provide PPE, they must first ensure that they have protected their employees from all the other risks to do with their health or safety. PPE, it says, should be one of the last control levels that should be identified.</p> <p>For instance where the PPE is made available to employees, it should involve no cost to them and employers should make sure that they have provided free training on the proper use of the PPE.</p>	YES
3.0	Occupational Noise	Occupational Noise is the subject of a CoP that sets out the requirements and standards for controlling the risks associated with noise levels at or beyond 85 decibels (dB), where either employees, contractors or visitors could be at risk. It is measured on an A-weighted scale at any time during a work shift and is managed in an appropriate manner.	YES
3.1	Vibration	<p>This is the CoP that establishes what is required for controlling and offering measures that ensure that the risks associated with exposure to vibrations are significantly minimized, and that control measures in accordance with the hierarchy of control measures have been implemented. Measures must be taken as a way of preventing disease, illness and injury to those who might suffer from the risks that are associated with these activities.</p> <p>It is also the CoP that covers all worksites where people might be exposed to vibrations at any dangerous level. These worksites includes places</p>	YES

CoP #	Title	Description	Related to Construction
		where manufacturing, maintenance, construction, the operation of heavy plant and equipment, vehicles and trucks take place, among others.	
4.0	First Aid and Medical Treatment	<p>The First Aid and Medical Treatment CoP is one that applies to all employers in the Emirate of Abu Dhabi and dictates that all workers, employees or other persons on the premises should be accorded first aid and emergency treatment.</p> <p>First aid is referred to as the immediate assistance that is given to individuals suffering from a sudden illness or injury in their place of work, and that the care is given with the aim of preserving life, or preventing the condition from worsening, as well as, or promoting recovery. This care may be provided by a professional medical practitioner.</p> <p>It also dictates that individuals with claims of being professionals in the occupational setting and/or at the employer's accommodation who are tasked with providing medical services that go beyond first aid must bear a valid practicing license as a requirement by the Health Authority – Abu Dhabi (HAAD).</p> <p>Facilities with claims to offer advanced first aid and medical services must also maintain valid licenses as required by the same body.</p> <p>Before employers have implemented the first aid requirements, they must first undertake thorough risk assessments to identify their needs.</p>	YES
8.0	General Work-place Amenities	<p>CoP 8.0, General Work-place Amenities is the one that outlines the minimum mandatory OSH requirements that should be implemented by employers in such issues as</p> <ul style="list-style-type: none"> • Housekeeping • Floor landing and Shelf Loading Protection • Heating, Ventilation, and Air Conditioning (HVAC) • Drinking Water (Potable Water) • Windows, Skylights, Ventilators and Transparent or Translucent Doors • Lighting • Room Dimensions and Space • Sanitary Conveniences (Bathrooms) 	YES
9.0	Work-place Wellness	This purpose of this CoP is to contribute to preventing of the common health conditions that are normally found at places of work. The requirements	YES

CoP #	Title	Description	Related to Construction
		<p>that are covered with this document are designed to ensure that control measures are implemented in accordance with the hierarchy of controls and that those control measures are put into action to ensure that the people who might have been exposed to the risks that arises from those particular activities are prevented from getting injuries, illnesses and diseases.</p> <p>The CoP also looks to improve the wellbeing and health of employees in the Abu Dhabi Emirate for the purposes not only of having a healthy workforce, but one that is more productive. Specifically, it seeks to promote the awareness of ways of preventing health conditions that affect many of the Emirate's subjects, such as stress, cardiovascular diseases, tobacco-related diseases and as other general health issues. The other aim of this CoP is to establish the requirements and standards that are required to promote work-place health. The main goal is to ensure that the health and wellbeing of employees and other relevant persons are improved and thus contribute to wellness of the work-place.</p>	
9.1	New and Expectant Mothers	<p>This CoP contains requirements that are intended to specify the general requirements of provision for new and expectant mothers.</p> <p>It stipulates that an expectant mother is an employee who is pregnant, or one who has given birth to a child that is still living within the last six months and is still breast feeding.</p>	NO
9.2	Managing Work-Related Stress	<p>CoP 9.2 sets out the requirements for what is considered work related stress management and ensures that psychological hazards considered work related have been kept to the minimum.</p> <p>It also confirms that well designed work, which is well organized and well-managed, promotes personal health as well as employees' wellbeing. For instance where attention has been lacking, management organization, and the benefits that accompany what is considered as good work, could be missing, leading to work related stress.</p> <p>It further asserts that work related stress is one of the major causes of poor productivity and the human errors that stem from occupational ill health. This may result in sickness absence, general poor performance from employees and high staff turnover and the possibility of it increases due to human error.</p>	YES
10.0	Rehabilitation and Return to Work	This CoP outlines what is required for reasons of rehabilitating and the return to work by employees.	YES

CoP #	Title	Description	Related to Construction
		<p>They should be able to receive their appropriate benefits and treatment, including assistance to return to work after a period away if it stems from an injury, a disorder or a disease.</p> <p>Work-place rehabilitation is referred to as the management process that involves early, appropriate and timely interventions that are entirely based on the assessment of needs, whereby injured individuals are enabled to return to suitable employment. Every reasonable attempt is made to ensure that injured employees have been primarily returned to their pre-injury state.</p>	
11.0	Safety in the Heat	<p>This is a CoP that applies to every employer in the whole Emirate of Abu Dhabi who has employees who must work in places where the temperature is high. High temperature according to this CoP is defined as due to both weather, especially in the summer months, for those who must work outdoors, and the use of furnaces and ovens, amongst other sources of heat.</p>	YES
12.0	Prevention and Control of Legionnaires Disease	<p>Legionnaires disease is a respiratory disease which is caused by the <i>Legionella</i> bacteria. It sometimes transmits a serious type of lung infection, pneumonia.</p> <p>This CoP intends to make specifications on the general controls that are required to prevent the spread of legionnaire's disease. Specific technical requirements are attached to this CoP, and are referenced within it.</p> <p>He CoP dictates that the employer, also known as the duty holder, must ensure that every legal requirement for their operation or premises is in accordance with the requirements that are made in this CoP.</p> <p>Every duty holder and business entity in the Abu Dhabi Emirate whose equipment makes use of, stores or disseminates warm water is covered in this CoP. This embraces facilities such as swimming pools, water treatment installations, metalworking systems that use water, equipment for the manufacture of plastic parts using injection molding, hot water tanks, large air conditioning systems, water treatment facilities, hot tubs, heated spas, cooling towers and other facilities whose mode of operation involves the use and/or storage of water.</p> <p>This CoP exempts single-family, residential, buildings, but multi-tenanted residential quarters are considered commercial establishments and hence are covered by it. The managers of these buildings are considered the duty holders and hence they are</p>	NO

CoP #	Title	Description	Related to Construction
		required to follow the stipulations of this CoP as if they were the owners of the building.	
13.0	Violence in the Work-place	<p>This CoP makes sure that employers have taken measures to prevent or at least minimize violence in places of work, to protect employees as well as other potentially affected people against violence by ensuring that they have recourse to assistance. The definition of violence in the work-place is any damaging incident, behaviour or action that meets what is considered reasonable conduct by threats, assaults, harm or injury during or as a result of their work.</p> <p>Work-place violence includes:</p> <ul style="list-style-type: none"> • Violence from Strangers <p>This is the kind of violence that is perpetuated by individuals who have no ties with the employee's place of work.</p> <ul style="list-style-type: none"> • Violence by Customers and Clients <p>This is either the kind of violence that is committed by people who are recipients of a service or under supervisory custody at the affected place of work or the violated individual.</p> <ul style="list-style-type: none"> • Violence by Co-workers <p>This is the kind of violence that emanates from individuals who are either current employees or former employees at a place of work; e.g. a manager or a supervisor being violent to a junior employee.</p> <ul style="list-style-type: none"> • Violence associated with Personal Relations <p>This refers to the kind of violence that is committed by an individual who may have had a personal relationship with an employee outside the place of work.</p>	YES
14.0	Manual Handling and Ergonomics	<p>This CoP concerns employers as well as places of work/businesses in the Abu Dhabi Emirate where risk emanates from the availability of manual handling and work-place ergonomic activities that may lead to aggravated musculoskeletal disorders (WRMDs), amongst other illnesses and injuries. The specific requirements in this document do not in any way replace the requirements that have been set by the Federal or any other Emirate-regulating authority; they are more stringent.</p> <p>Manual handling also entails activities in the work-place that require the use of force in the manner of grasping, striking, manipulating, throwing, catching, moving (lifting, lowering, pushing and pulling), holding or restraining of an object, a load or a body part.</p>	YES

CoP #	Title	Description	Related to Construction
		Avoidance of hazardous manual handling is the principal method used to reduce risk in operating and designing places of work, in relation to the employee, in a manner that effectively reduces risk or eliminates this working hazard altogether. For instance, even when it becomes impossible to eliminate this risk entirely, there is a need to carefully and critically make assessments. Preventive and protective control measures are achieved through employers taking into account the task in question, the load, the working space, the capabilities imputed to the individuals and other important factors.	
14.1	Manual Tasks Involving the Handling of People	With reference to all the employers and the places of business within the Emirate of Abu Dhabi, this Code of Practice applies to the areas with risk exposure that stems from manual handling things and people. An example of this is the handling of patients in a hospital, which can give rise to aggravated musculoskeletal disorders (WRMDs) that are work related, as well as other injuries and illnesses. The CoP for Manual Tasks Involving the Handling of People is applicable to any place of work or activity that requires a person to use force in holding, supporting, transferring by means of lifting, lowering, carrying, pushing, pulling or sliding. It also includes the act of restraining another person in the work-place.	YES
15.0	Electrical Safety	The requirements as well as the standards that are associated with the risks of electricity are established in this CoP. It identifies, assesses and offers control measures that should be implemented in reducing these risks to levels that are considered acceptable. This prevents injuries and illness or disease to those who might otherwise be exposed to the risks that arise in these activities.	YES
16.0	OSH Requirements for People with Special Needs	Employers are required to implement this CoP when they employ people with special needs. The CoP outlines the consideration and management of the risks involved when an employee has special needs in a manner that mitigates or prevents any incident that these people might be exposed to in the course of their occupation. It is also in this CoP that a person with special needs is defined in the Federal Law 29 of 2006 as anyone who suffers or is suffering from a permanent or temporary,	NO

CoP #	Title	Description	Related to Construction
		full or partial infirmity or deficiency which could be physical, mental, sensational, psychological, educational or communicational to a point where their impairments actively reduce decreasing the possibility of their being able to satisfy their ordinary needs in the condition of those who do not have special needs. This CoP also establishes that those who are considered as individuals with special needs will be granted a card by the Ministry of Social Affairs as required by law 29(2006), In Respect Of The Rights Of People with Special Needs.	
17.0	Safety Signage and Signals	Safety Signage and Signals are dealt within this CoP, which requires employers to make use of safety signage wherever OSH RISK Safety signs cannot be used to replace other methods used in controlling risk which entails either engineering or systems of work. This CoP also applies to all places of work and to activities which employ people, but it excludes signs that are used in connection with transportation, or the supplying or marketing of dangerous substances, products, materials or equipment.	NO
18.0	Employer Supplied Accommodation - General Requirements	This is the CoP that applies to all forms of both permanent and temporary accommodation provided by an employer. The associated document OSHAD-SF-CoP 18.1 contains more information pertaining to Temporary Employer Supplied Accommodation. The requirements of this CoP should be considered the main criteria on which the design, management, construction and operation of accommodation supplied by the employer is based, according to the law and local by-laws and those international practices that are considered the best. Employer-supplied accommodation refers to the kind of accommodation that is directly either paid for, or supplied to an employee/group of employees and might equally include this employee's family members. It excludes the kind of accommodation that an employee pays for directly either through rent/lease or purchase through the use of an employer- paid accommodation allowance.	YES
18.1	Temporary Employer Supplied Accommodation	This CoP's requirements are considered the main criteria through which the construction, design, management and operation of temporary labour accommodation are chosen in accordance with the law and the local by-laws and the best international practices. It applies to various relevant entities such	YES

CoP #	Title	Description	Related to Construction
		<p>as contracting companies, consultants' offices and other establishments.</p> <p>It also stipulates that a temporary employer should supply accommodation, in terms of buildings or facilities that have been designed and constructed for the purposes of providing temporary lodging for both the employee and other persons that are involved in project/construction work, as well as other short-term activities with a limited time frame.</p>	
19.0	Occupational Food Handling and Food Preparation Areas	<p>This CoP refers to the manner in which food handling and food preparation are standardized. The reason that the standard exists is to ensure that the employees' health and fitness are maintained through the provision of detailed guidance and best practice, thus equipping both employees and employers are with the kind of know-how that enables them get rid of or avoid the danger, hence reducing the risks in their day to day activities.</p>	NO
20.0	Safety in Design (Construction)	<p>The Safety Design Code of Practice, also referred to as the Construction CoP obliges designers under the AD EHSMS RF-Element 01-Rules to self-regulate and be responsible for reducing or eliminating the risks that could arise as a result of using structures or pieces of equipment during construction. Designers should ensure that at every stage they have identified and analyzed any foreseeable risks so as to reduce these risks to the minimum.</p> <p>The areas that are covered by this CoP concern the operation, construction and decommissioning design of buildings, structures and work-places. However, it exempts the coverage of product designs which are to be designed to the kind of standards that are both locally and internationally appropriate, for instance the European Conformity "EC Marking"</p> <p>Designers of work or operational areas should incorporate both the flow of materials and ergonomic considerations.</p> <p>The safety and health in construction areas is normally fundamentally affected by the earliest decisions of the designers and these also later influence the design choices, prompting the need for considerable work in case they deem it necessary to re-cast their earlier decisions. It is for this reason that they must be sure that the health and safety precautions have been addressed from the very beginning.</p>	YES

CoP #	Title	Description	Related to Construction
21.0	Permit to Work Systems	<p>This CoP is relevant to every employer in Abu Dhabi since it sets the required permits for threshold to work systems and the way in which they would be required to work in their respective places of work.</p> <p>A formal process that is recorded as is use in the control of work which is considered to be essentially dangerous is referred to as a Permit to Work (PTW). It is also taken as a way for site installation managers, operators, plan supervisors and those who actually carry out the actual hazardous work to communicate. The basic features of a PTW are that it</p> <ul style="list-style-type: none"> • Identifies individuals who are to authorize particular jobs and the extent of their authority and also specifics who are responsible for issuing out precautions. • Covers the issue of use or closure of a permit to train and to instruct. • Ensures that the system works as intended through monitoring and auditing. • Identifies the types of work that are considered dangerous. • Lists and standardizes the tasks clearly, makes risk assessments, sets the duration of tasks and supplements or lists what are considered simultaneous activities and control measures. <p>Through relying on specified personnel to implement its requirements under competent supervision, a PTW is able to make a job safe. For this reason it is important that all those who undertake dangerous work demonstrate that they have indeed followed the appropriate risk assessment process to identify and then minimize any hazard that is associated with the proposed work.</p>	YES
22.0	Barricading of Hazards	<p>This is the CoP that sets out the requirements and the kinds of standard that reduce or terminate risks and are sometimes considered physical hazards by applying and maintaining barricades.</p> <p>The general term that is used to refer to a structure with both horizontal and vertical components that is used to create a restriction in order to prevent unauthorized access to possibly hazardous work areas is referred to as “Barricading”.</p>	YES

CoP #	Title	Description	Related to Construction
23.0	Working at Heights	<p>This CoP covers the requirements related to planning, preparation and work practices in regard to the working heights that conduce to health and safety. This CoP includes:</p> <p>The places of work that exist and the various means of access to working at height;</p> <ul style="list-style-type: none"> • tower cranes; • guardrail systems • roof works; • ladders; • fall prevention devices • working platforms. • fall arrest systems; and • safety nets <p>Working in a high place entails the risk of an employee falling from any height, through, into, or onto a structure or a place.</p> <p>If there is a possibility of injury from falling from a height, the “at height” provision ultimately applies, regardless of whether the fall ends on the ground or below it.</p> <p>Before undertaking any work at height, employers must always ensure that a full specific risk assessment has been made, so as to identify the appropriate measures of control.</p> <p>This is why the hierarchy of control for working at height is distinct from that for other activities.</p> <ul style="list-style-type: none"> • any form of work that is done at height is only done due to the lack of alternatives, and even then it should be made safe and should be reasonably practical. • the employer should ensure that appropriate equipment and other measures are provided and should ensure that falling from a height is always prevented, as far as possible. • Employers should also work to ensure that, in areas where it is not reasonably practical to prevent falls, they have provided work equipment and other measures for reducing the distance one could fall or even preventing the fall altogether. 	YES
24.0	Lock-out /Tag-out (Isolation)	<p>This CoP contains the requirements and standards to ensure that the risks that are associated with a lockout/tag out, also known as isolation use, has been assessed and the relevant control measures</p>	YES

CoP #	Title	Description	Related to Construction
		<p>implemented according to the stipulations of the hierarchy controls in measures that help to prevent injuries, diseases and illnesses that an individual could have been exposed to while engaging in these activities.</p> <p>The Lock out /Tag out CoP defines the manner in which a device is introduced with the aim of achieving the isolation of an energy source and the placing of a tag in the isolated device in order to show that the device is actually out of service for either repair or maintenance.</p> <p>This CoP applies to machinery and equipment under maintenance and servicing which, due to their unexpected start up energy could cause injuries to the employees who work on them. This CoP stipulates the minimum requirements of performance.</p> <p>However, this CoP exempts normal production operations with servicing and /or maintenance which are considered to take place during normal production operations and are the only elements covered by the following conditions:</p> <ul style="list-style-type: none"> • an employee has been required to remove or simply not make use of a guard or a safety device: or • an employee has been required to place any part of his/her body in the area of operation, an area where a machine or a piece of equipment stands and is used. <p>Where this is not applicable, then:</p> <ul style="list-style-type: none"> • When an employee exclusively through controlling of the services and maintenance of a machine works on a code and plug that are connected to an electric source, leading to exposure to hazard from the unexpected energization or the starting up of some equipment which is controlled by unplugging this equipment from its source of energy • With regard to the operation of hot taps involving the transmission or distribution of systems such as gas, steam, water or petroleum products along highly pressurized pipelines, the employees must demonstrate that: <ul style="list-style-type: none"> • The service must continue • It would be impractical to shut it down 	

CoP #	Title	Description	Related to Construction
		<ul style="list-style-type: none"> That only the documented procedures for the specialized equipment are made use of and that it has shown itself capable of offering enough protection to the employees 	
25.0	Driver Fatigue Prevention	This CoP covers the protection of employees from fatigue that comes from incidents related to driving. This CoP establishes the standards that are operational for avoiding fatigue as well as the management of other fatigue related issues.	NO
26.0	Scaffolding	<p>This CoP refers to Scaffolding and sets out the requirements and the standards in assessing the risks associated with the use of scaffolding. It also lists the control measures to implement in respect of the hierarchy of controls and the measures that should be taken to prevent injuries, illnesses and diseases that a person engaged in those activities might be exposed to.</p> <p>Additionally, this CoP invokes planning, assessment and control measures that enable people to erect, use, maintain, alter and dismantle scaffolding. The inspection of scaffolding is also covered here. This CoP refers to all platforms in use irrespective of the height of the scaffolding and whether or not all the components or part are concerned</p> <p>Every piece of modular scaffolding, each tube and coupler in the scaffolding, every piece of suspended scaffolding, all forms of swinging states and every plank that has been placed across a structure that has not been engineered in a manner to accept planks The reference is included.</p> <p>Generally, scaffolding is described as a temporary structure erected either on the outside or the inside of a building, made of either wooden or metallic poles/planks and used by employees to build, repair or clean a building.</p> <p>The above definition exempts fabricated working platforms, trestles that include boxes and all motorized platforms.</p>	YES
27.0	Confined Spaces	Confined Spaces are considered in a CoP that lays down the requirements and standards arising from the risks of working in confined spaces. It assesses the control measures that should be implemented as they are stipulated in the hierarchy of controls and also the various measures that should be taken to prevent diseases, injuries or illnesses that might befall anyone who engages in this kind of work.	YES

CoP #	Title	Description	Related to Construction
28.0	Hot Work Operations (e.g. Welding and Cutting)	<p>This CoP covers the requirements and the various standards for assessing the risks associated with hot work operations. It offers measures of control that can be implemented in accordance with the existing hierarchy of controls together with various solutions for use in preventing injuries, diseases and illnesses to employees exposed to the risks entailed in these activities.</p> <p>This CoP includes various precautionary measures to take before and during the actual work, welding included, so as to prevent a possible outbreak of fire that might threaten property or even lives. Such precautions are particularly applicable to the processes of construction, manufacturing, repairing, maintenance, or demolition, where the plant or the equipment in question uses combustive, flammable or explosive material.</p> <p>“Hot work” is refers to grinding, welding, thermal or oxygen cutting, and to heating and other operations that produce sparks.</p> <p>“Welding” is used to refer to the fusion of two pieces of metal, rendered plastic or even liquid through the use of either heat or pressure, or sometimes both. Welding entails many processes, the most common ones in the construction industry being those which use gas or electric arc welding.</p> <p>“Hazardous Area” refers to the vicinity of flammable gases, vapors, or liquids; combustible dusts or fibers and other forms of flammable or explosive substance that might be in the vicinity.</p>	YES
29.0	Excavations	<p>Extraction is the subject of a CoP which establishes the requirements and the standards for assessing the risks associated with excavating and enables measures of control to be implemented. This takes place in a manner that conforms to the hierarchy of controls in order to prevent any injuries, illnesses and diseases that might stem from exposure to the risks of conducting these activities.</p> <p>Excavation in this CoP covers:</p> <ul style="list-style-type: none"> • Every process and activity that involves moving earth or rocks in such a way as to disturb or break up the ground. • All the work of driving an object into the ground. • Any other form of work that may lead to any of the following: 	YES

CoP #	Title	Description	Related to Construction
		<ul style="list-style-type: none"> I. Striking of underground surfaces, or damaging, undermining or taking support from them and II. Exposing of protective covers, warning tapes or damaging earthing conductors. <p>:</p> <p>Activities of excavation are defined as:</p> <ul style="list-style-type: none"> I. Every act of digging that might include trenches, wells, ditches or filling. II. Grading; III. Processes of tunneling, boring and/or drilling IV. Driving that includes the driving of earth electrodes; star pickets, and the driving of fence posts; and all other work that entails the use of caissons or cofferdams. This may provide space down to the foundation level that involves excluding so much water that workmen may descend to it, and plant may be brought down, spoil may be removed and excavation that is considered permanent can begin. 	
30.0	Lone Working and/ or Working in Remote Locations	<p>This CoP defines lone work; that is, working alone without close or direct supervision. Among the numerous institutions where people practice lone working are those:</p> <p>where people work in establishments that are fixed and therefore;</p> <ul style="list-style-type: none"> I. A single person mans the premises, e.g. petrol stations, small workshops, shops, kiosks and also employees who work from home. II. Where people are forced to work separately from their colleagues, such as in warehouses, factories, some research and training establishments, and leisure centers, amongst others. III. Finally there are instances when due to the nature of their work they are forced to work outside the normal hours, for example, cleaners, security, special production, maintenance or repair staff, etc. <p>Mobile employees who are working away from their routine locations also belong to this category:</p> <ul style="list-style-type: none"> I. In the area of construction where plant installation, maintenance and cleaning work is being carried out, vehicles, 	NO

CoP #	Title	Description	Related to Construction
		<p>electrical installations and lifts are being repaired and other things are being done, such as painting and decoration.</p> <p>II. services and agricultural work are also covered in this CoP. Postal and courier staff, domestic staff, pest control employees, drivers, engineers, architects, estate agents, sales representatives and similar professionals visiting domestic and commercial premises are all lone workers.</p>	
30.1	Working in International Locations	<p>The establishment of the requirements and the standards to do with risks associated with identifying, assessing and controlling the hazards from working in international locations is covered in this CoP. Issues that are covered here include the infrastructure, differences in terms of culture and political climate from what is typical of Abu Dhabi. It also covers the elements in planning international travel for the employees concerned, and includes consideration of the various threats that might emanate from traveling, e.g., terrorism and diseases that might ensue in consequence of traveling. It dictates the requirements to use in assessing the risks in the planning stage of an international activity. Employers and employees alike are supposed to know about the prevailing conditions that they may encounter both during their traveling and at their destinations; they should be able to take the appropriate precautions to minimize or controlling the risks. This CoP covers the main areas of risks.</p>	NO
31.0	Working On, Over or Adjacent to Water	<p>The requirements and standards that address the risks for someone who works on, over or directly adjacent to water are defined in this CoP. It assesses the various control measures that could be implemented at the request of the hierarchy of controls to prevent or reduce the chance of ailments, injuries or diseases that might ensue from engaging in these activities. Working on, over or adjacent to water entails a few hazards very similar to those working at a height. They include:</p> <ul style="list-style-type: none"> • Slipping and falling into water, thereby drowning. • Being injured, or drowned as a result of being swept away by fast-moving water. 	NO

CoP #	Title	Description	Related to Construction
		<ul style="list-style-type: none"> • Being struck by water traffic • Getting electrocuted after falling into water carrying an item of electrical equipment. 	
33.0	Working On, or Adjacent to a Road	This the CoP establishes the requirements and standards to do with the risks associated with road works. It applies to newly constructed highways o=and to work to resurface an already existing roadways. It assesses the measures of control that could be implemented according to the hierarchy of controls in the quest to prevent injuries, diseases and ailments that might ensue from exposure to the risks of engaging in these activities.	NO
34.0	Safe Use of Lifting Equipment and Lifting Accessories	This CoP assesses the kind of control measures that could be used to prevent illnesses, injuries and diseases which might ensue from exposure to the risks of lifting equipment and other things. This is done by ensuring that the control measures are in accordance with the hierarchy of controls.	YES
35.0	Portable Power Tools	<p>The Portable Power Tools CoP sets out the standards and requirements of the kinds of risk that stem from using such tools, offering control measures for implementing according to the hierarchy of controls. The standards are observed to prevent diseases, illnesses and injuries from exposure to the risks from using these tools.</p> <p>This CoP, “Portable Power Tools” is taken generally to refer to quite a number of tools that are used in the power industry, which is highly dependent on the kinds of power source that they use.</p>	YES
36.0	Plant and Equipment	<p>This CoP lays down the requirements and standards ton control the risks from using plant and equipment. This CoP assesses the various control measures that could be implemented to prevent such diseases, injuries or illnesses that might be contracted from using plant and equipment/ Yet it still makes sure that a limit is set within the hierarchy of controls through its application to the entire management of the plant, the equipment and the obligations and requirements of the designers, the manufacturers, the erectors, the suppliers, installers, employees and employers.</p> <p>The requirements for maintenance, servicing, cleaning, inspection, modification and the auditing and record keeping of the plant are also covered in this CoP.</p>	YES

CoP #	Title	Description	Related to Construction
		<p>Generally, the terms plant/equipment are used to refer to machinery and appliances. Some common types of plant are found in numerous places of work:</p> <ul style="list-style-type: none"> • powered mobile plant, • static or fixed plant • plant that lifts people • components of plant 	
37.0	Ladders	<p>This is the CoP that covers the requirements and standards to do with the risks entailed in the use of ladders. It also assesses the kind of control measures that would be applicable in the hierarchy of controls and makes certain that control measures are properly applied in eliminating illnesses, diseases and injuries that might have occurred from exposure to the risks of working with ladders.</p> <p>This CoP is implemented in accordance with the OSHAD-SF – CoP 23.0 – Working at Heights.</p>	YES
38.0	Concrete Placing Equipment	<p>The concrete placing Equipment CoP entails the establishment of the requirements and standards associated with risks arising from the use of concrete placing equipment. This CoP assesses the valid control measures that could be implemented in a way that is sensitive to the hierarchy of controls, and keeps these measures effective in the prevention of injuries, illnesses or diseases that might have occurred to an individual exposed to the risks that comes with the above activities.</p> <p>All types of concrete pump, as well as the associated placing equipment used in the spraying or pumping of concrete are covered in this CoP.</p> <p>The basic process of pumping concrete efficiently occurs in the manufacturing of precast, tilt up panels, concrete paving, concrete construction, slab construction, concrete spraying and reinforcements</p>	YES
39.0	Overhead and Underground Services	<p>This is the CoP covering the processes of planning, preparing and conducting health and safety practices for implementing overhead and underground services to:</p> <ul style="list-style-type: none"> • overhead power cables; • underground: <ul style="list-style-type: none"> i. power cables; ii. water pipelines; iii. fiber optic cables; iv. telecommunications cables; v. sewage lines vi. gas pipelines; or vii. petroleum and fuel oil pipelines. 	YES

CoP #	Title	Description	Related to Construction
40.0	Force Work (Formwork)	<p>The Force Work or Form Work CoP refers to the requirements and standards to do with the risks in force work. This CoP assesses the control measures that could be applied considering the hierarchy of controls and the measures that can be taken to prevent the injury, disease or illness that might follow the exposure to risk of engaging in force work.</p> <p>This CoP is one that is applied in to the entire work-force as an obligation of the employers, designers, consultants, contractors and employees.</p> <p>Force work is defined as a temporary structure supporting a permanent structure from its erection until it becomes self-supporting. It might include the form or even the mold that concrete is poured upon, and is popularly known as form work.</p> <p>This definition is not limited to institutional concrete alone, but has been extended to refer to other precast concrete structures, such as structural steel and steel erections and items such as brick arches, as well as other kinds of construction where the structures may be permanent but are as yet unstable and in need of support .</p> <p>This might also entail force work that has been installed in order to support structural elements such as in-situ slabs that have been designed to bear the weight of a supported structural element.</p>	YES
41.0	Steel Erection	<p>Steel Erection is covered in a CoP that outlines the requirements and standards for assessing the risks in the way steel is erected during a construction process. It offers control measures that could be implemented, while bound to the hierarchy of controls, since these control measures are implemented with the desire of preventing injuries, diseases or illnesses from exposed to the risks that comes from being exposed to the above activities.</p> <p>Generally, self erection has been defined as a term for the tasks in erecting and dismantling steel frames .</p> <p>The specifics in steel erection includes hoisting, connecting, welding, bolting, and rigging structural steel, steel joists and metal buildings; installing metal deck, siding systems, miscellaneous metals, ornamental iron and similar materials</p>	YES
42.0	Pre Cast Construction	<p>This CoP sets out all the requirements that are associated with precast concrete elements. It also assesses the various measures of control that should be implemented in line with the hierarchy of controls and the kinds of measure to take in ensuring that illnesses, injuries and diseases have been prevented,</p>	YES

CoP #	Title	Description	Related to Construction
		<p>which otherwise might have resulted from exposure to the risks arising from the above activities.</p> <p>The Construction CoP entails:</p> <ul style="list-style-type: none"> • safe design • prefabrication and casting • handling, storage transportation • erecting of the cast 	
43.0	Temporary Structures	<p>The risks that accompany temporary structures have requirements as well as standards for the manner in which the risks that are inherent in temporary structures are handled by control measures and proper planning are addressed in this CoP.</p> <p>A temporary structure has been defined as the kind of structure that includes port cabins, containers and tents, and has been erected on a temporary basis.</p>	YES
44.0	Traffic Management and Logistics	<p>The risks of traffic and logistics, as well as their requirements and standards in dealing with them are catered for in this CoP. It sets out ways for minimizing or preventing these risks through the introduction of whatever measures are considered appropriate.</p>	YES
45.0	Underwater Activities	<p>Every single place of employment that lies under the waters of the Abu Dhabi Emirates is dealt with in this CoP. It covers diving, as well as each and every other related support undertaking in all types of work and activity including general industry, construction, recreational diving, commercial diving, ship repairing, shipbuilding, ship-breaking, and long-shoring.</p>	NO
46.0	Underground Construction (e.g., Tunnels, Shafts, and Piling)	<p>This CoP seeks to establish the kind of requirements and the level of standards that are associated with the risks from underground construction. It also assesses the kind of control measures that could be implemented consistently with the hierarchy of controls. It equally ensures that measures to prevent injuries, illnesses and diseases such as might stem from the risks arising from those activities are in place.</p> <p>This CoP dictates that underground construction is covered in part by:</p> <ul style="list-style-type: none"> • piling • tunneling; and • shaft sinking. 	YES
47.0	Machine Guarding	<p>The requirements and the standards in outlining the risks associated with the guarding of machinery and the assessment of the measures of control that could be implemented to prevent injuries, illnesses and</p>	YES

CoP #	Title	Description	Related to Construction
		diseases from exposing people to the above activities are covered in this CoP.	
48.0	Spray Finishing	Spray Finishing is covered in this Code of Practice that makes sure that all the employers within the Abu Dhabi Emirate who apply spray finishing do in fact make use of spray painting.	YES
49.0	Compressed Gases and Air	This CoP covers every employer in the Abu Dhabi Emirate whose business makes use of compressed gases including compressed air. According to AD EHS RI – CoP 1.0 – Hazardous Materials, the labeling of containers is entailed.	YES
50.0	Abrasive Blasting and associated Protective Coating Work	All employers who make use of abrasive blasting in the Abu Dhabi Emirate are covered in this particular CoP. <i>Abrasive blasting refers to the application of force to apply an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.</i>	NO
51.0	Powered Lift Trucks	Where the use of the lift trucks is concerned, this is the CoP that sets up the various requirements for the OSHAD-SF as defined in Appendix 1 showing Figure 1-7 of the CoP. A powered industrial truck is as an industrial vehicle used to carry, push, pull, lift or stack materials, and is powered by either an electric motor or an internal combustion engine. Some specific examples are forklift trucks, rider trucks, motorized or powered hand trucks, pallet trucks and tugs. However, it is also worth noting that this CoP leaves out all lifting operations as well as lifting equipment and any requirements that are specific to the Safe Use of Lifting Equipment and Lifting Accessories- OSHAD-SF – 34.0 .	YES
52.0	Local Exhaust Ventilation	This is the CoP that sets out the requirements for controlling gas, vapor, dust, fumes and mist in the various places of work. It makes use of local exhaust ventilation (LEV) to get rid of contaminants before they can affect the employees.	YES
53.0	OSH Management During Construction Work	This is the CoP that establishes the various requirements and standards that govern the control by contractors on a construction site. It entails assessing the kind of control measures that could be implemented while observing the hierarchy of controls. It seeks to prevent injuries, diseases and illnesses that could stem from exposing someone to the risk posed by the above activities.	YES

CoP #	Title	Description	Related to Construction
53.1	OSH Construction Management Plan	<p>This CoP establishes the minimum requirements and standards for developing and implementing an OSH Construction Management Plan (OSH-CMP) to ensure that every construction project keeps in mind all the hazards implied by the safety legislation in the Emirate of Abu Dhabi, particularly those are referred to in the OSHAD-SF.</p> <p>The OSH-CMP is described as a plan that has been developed with each site's specifications in mind to ensure that the right OSH management practices are employed and monitored throughout its construction period.</p>	YES
54.0	Waste Management	<p>This is the CoP that stipulates the minimum requirements and standards for the handling and management of waste. Entities are cautioned on the assessment, control and disposal of their waste so as to implement the control measures that lie in the hierarchy of control in a way that takes care of the risks associated with waste handling and management to prevent pollution as per OSHAD-SF Element 02. It also lays down the minimum requirements covering not only the handling of the waste, but also its transportation and disposal of the waste, while recording and collecting waste data and using transport manifests.</p> <p>However, this CoP excludes;</p> <ul style="list-style-type: none"> • The kind of waste that is discharged into the atmosphere in terms of gases, vapors, fumes, aerosols, dusts or particulates. • The kind that is discharged into the atmosphere in the form of radioactive waste. • Industrial waste in the form of Sewerage 	YES

Questionnaire

Questionnaire coding

CODE	SUBJECT
Part 1:	
Affective Commitment	
AC1	I would be very happy to continue working for my current employer
AC2	I enjoy talking to people and my friends outside about my work and the company I work for

AC3	I really feel that the H&S problems in this company are my own, and I will try my best to solve them
AC4	I think I could easily become as attached to another company and new employer as I am to this one
AC5	I do not feel like 'part of the family' at this company.
AC6	I do not feel 'emotionally attached' to my employer company.
AC7	My employer's company has a great deal of personal meaning for me.
AC8	I do not feel a 'strong' sense of belonging to my employer company.
Continuance Commitment (CC)	
CC1	I am not afraid of what might happen if I quit my current job without having another one lined up.
CC2	It would be very hard for me to leave my employer's company right now, even if I wanted to.
CC3	Too much in my life would be disrupted if I decided to leave this company now.
CC4	It would not be too costly for me to leave company now.
CC5	Right now, staying with my company is a matter of necessity as much as desire.
CC6	I feel that I have very few options to consider in leaving this company.
CC7	One reason that stops me from leaving this job at this company is that I will not find anew job somewhere else.
CC8	One of the major reasons I continue to work for this company is that I will not find another company that offers the same benefits I have here.
Normative Commitment Scale (NCS)	
NC1	I think that people these days move from one Construction Company to another too often.
NC2	I do not believe that a person must always be loyal to one Construction Company or one employer.
NC3	I think it is ok, and it is ethical to jump from one Construction Company to another.
NC4	One of the major reasons I continue to work in this company is that I believe loyalty to your recent employer is important and therefore feel a sense of moral obligation to remain
NC5	If I got another offer for a better job elsewhere, I would not feel it was right to leave this company.
NC6	I was taught to believe in the value of remaining loyal to one company and one employer.
NC7	Things were better in the days when people stayed in one company for most of their career.
NC8	I do not think that to be a 'company man' or 'company woman' is sensible and important any more.
Organizational Commitment (OC)	
OC1	This organization makes personal sense to me.
OC2	I feel a strong commitment to this organization.
OC3	I feel myself a member of the family in this organization.
OC4	I feel myself emotionally engaged to this organization.
Absenteeism	
AB1	In the last week, how many times did you miss some hours of the total working hours (arrive late to work, or leave early)
AB2	In the last month, how many times did you miss the entire workday because of health or physical problem?
AB3	In the last month, how many times did you miss the entire workday because of other reasons like annual leave?
AB4	In the last month, how many times did you miss the entire workday because you did not feel like going to work?
AB5	In the last month, how many times did you come to the construction site early, go home late, or work on your day off?
Work Alienation	
WA1	I am not pleased about what I do in my organization; I spend time only to be paid
WA2	It is a painful and boring experience to face my daily duties in my organization.
WA3	For me working is rather drudgery or a burden.
WA4	I feel myself detached/distanced from my organization.
WA5	I wish I was doing something different.

WA6	In time, I have become disappointed about my job.
WA7	I do not feel like putting more effort into my job.
WA8	I do not feel engaged with the events occurring around me in my organization (I do not care about anything).
Job Performance	
JP1	I always complete the tasks involved in the job description in my work-place.
JP2	I fulfill my responsibilities as required by my job.
JP3	I am not successful in fulfilling my basic tasks.
JP4	I do not neglect the tasks as required by my job.
JP5	I fulfill the formal tasks as required by my job.
PART 2: Workers' Personal Traits	
Self-Efficacy	
Code	I see myself as someone who
SE1	Looks out for my own safety
SE2	Look out for the safety of my co-workers
SE3	Helps a co-worker do a job more safely
SE4	Identifies risky work behaviour in a co-worker
SE5	Keeps a safe rate of work and still gets the job done on time
SE6	Will stop a team member in my work area if I think they are doing something risky
SE7	Will stop someone working outside my work area if I think they are doing something risky
SE8	Will stop a co-worker with more experience on the job than me if I think they are doing something risky
SE9	Deals with most safety issues
SE10	I am a strong person and I will not have an accident at work
SE11	I am at risk of an accident while working, even if I regularly comply with the safety rules
Outcome Expectancy/Self-awareness	
	I see myself like this:
OE1	If I skip safety rules I will feel disappointed in myself
OE2	If I skip safety rules it becomes more convenient or easier to do my job
OE3	If I skip safety rules I will feel more comfortable
OE4	If I skip safety rules I will be injured
OE5	If I skip safety rules I will save time
OE6	If I do not follow the safety rules at work, my colleagues will blame me
Actively Caring behaviors	
	I see myself as someone who
ACB1	observes co-workers' safety-related behaviors
ACB2	cautions my co-workers if they are doing something risky
ACB3	gives my co-workers safety-related feedback
ACB4	in my opinion, finds discussing and exchanging ideas with my colleagues about safe working is helpful to prevent accidents
Attitude	
	I see myself as someone who thinks that
AT1	Compliance with safety rules at work is time-consuming
AT2	Brave and strong men never use personal protective equipment (like helmets, safety gloves &c.) while working
AT3	Sometimes conditions such as heat or harassment resulted from safety measures
AT4	equipment (like helmets, safety gloves &c.) hamper me from working safely
AT5	Sometimes it is necessary to disobey the safety rules at work to increase the production rate
AT6	In my opinion, work accidents depend on chance
AT7	Safe working results in slow progress of the jobs
AT8	I think work accidents are the results of fate

AT9	I tend to be disorganized in doing my work
AT10	I tend to worry about my work
AT11	I tend to be easy going in my job
AT12	I tend to remain calm in risky and tense situations at my work-place
AT13	Before doing my work, I tend to make plans and follow through with them
AT14	I only enjoy work that is routine
AT15	Sometimes in my work-place I tend to be temperamental
AT16	I tend to be nervous about my work
AT17	I tend to argue a lot with my co-workers
PART 3: Implementing H&S in Construction Sites	
PPE	
PPE1	I Have my own PPE
PPE2	I use appropriate PPE every time I go to the site or perform a job
PPE3	I received proper training on how to use PPE, where to store it, and how to clean it
PPE4	My employer/responsible person is conducting appropriate inspections for all PPE
PPE5	I didn't pay for my PPE, and the company was responsible for all the costs
First Aid	
FirstAid1	First aid facilities and boxes are available in the site and identified by a first aid sign.
FirstAid2	First aid boxes at the worksites include all the important and basic contents and they are cleaned and monitored regularly.
FirstAid3	First aiders and on-site medical providers' details and contact numbers are located in clear locations, where the first box is, and throughout the worksite.
FirstAid4	I receive proper information from my employer/supervisor regarding first aid in a clear language.
FirstAid5	I know when, how, and where to receive first aid or medical emergency treatment.
Safety in the heat	
SafetyHeat1	I received good awareness on working in the heat during summer months and the company has informed me about the signs of heat illness.
SafetyHeat2	The company has informed me about the importance of keeping myself healthy by hydrating and eating well in the summer, and they are supplying appropriate food, and an appropriate quantity of fluids (like potable water)
SafetyHeat3	The company is offering shade and cooling shelters for workers who working outdoors in the summer months
SafetyHeat4	I do not work outside in the middle of the day during the period from 15 June till 15 September
SafetyHeat5	I have been provided with appropriate clothing (e.g. lightweight, cotton, light-colored) to use during summer.
PART 4: General Information	
Job position (code: Job position)	
	Construction company owner
	Supervisor
	Worker
Gender (code: Gender)	
	Male
	Female
Education (code: Education)	
	Did not complete high school
	Completed High school
	High school diploma

	Bachelors
	Masters or above
Number of years worked in the current position (code: Experience)	
	1 – 5
	5 – 10
	10 – 20
	Above 20
Type of construction site (code: Site Type)	
	Residential building construction
	Industrial construction
	Commercial building construction
	Heavy civil construction
	Other, please specify.....

☐ Request for Information (a summary copy of the study will be provided) (Code: RequestData)

Thank you for completing this questionnaire.

Research Questionnaire

Questionnaire Cover Letter

The impact of the implementation of Abu Dhabi occupational health and safety management system in workers' performance in construction industry in Abu Dhabi

Dear Participant,

The construction industry is one of the important industries. It employs around 180 million people throughout the world. The sector has experience a number of improvements to ensure the safety in the industry, but still, it is highly risky occupation where accident rate is even common as compared to other industries of the world.

The objective of this research is to evaluate the impact of applying occupational health and safety management system in the performance of workers in construction sector in Abu Dhabi. Your input will help us to find the relationships between health and safety practices and performance to improve the industry. We have estimated that it will take you approximately 10-15 minutes to complete the survey.

All individual responses will remain confidential and study data will be integrated and analysed as a whole. The research outcome will be reported in a summary form to protect confidentiality.

If you have any concerns or questions about the questionnaire or about participating in this research, you may contact me at 2015132139@buid.ac.ae.

Alternatively, you may communicate my director of studies, Professor H. Boussabaine on 04 279 1437 (halim@buid.ac.ae).

Thank you for your time and support and I look forward to sharing the results of this survey with all of the participants

Yours faithfully
Awatif Al Hosani
PhD Candidate
British university in Dubai
Mobile: +971 503210393
E-mail: 2015132139@buid.ac.ae

The research directed by:
Professor H. Boussabaine
British University in Dubai
Tel: 04 279 1437

The Questionnaire

PART 1 Performance

1. Affective Commitment (EC)

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Affective Commitment	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.1 I would be very happy to continue working for my current employer					
1.2 I enjoy talking to people and my friends outside about my work and the company I work for					
1.3 I really feel that the H&S problems in this company are my own, and I will try my best to solve them					
1.4 I think I could easily become as attached to another company and new employer as I am to this one					
1.5 I do not feel like 'part of the family' at this company.					
1.6 I do not feel 'emotionally attached' to my employer company.					
1.7 My employer company has a great deal of personal meaning for me.					
1.8 I do not feel a 'strong' sense of belonging to my employer company.					

2. Continuance Commitment

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Continuance Commitment (CC)	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
2.1. I am not afraid of what might happen if I quit my current job without having another one lined up.					
2.2. It would be very hard for me to leave my employer company right now, even if I wanted to.					
2.3. Too much in my life would be disrupted if I decided to leave this company now.					
2.4. It would not be too costly for me to leave company now.					
2.5. Right now, staying with my company is a matter of necessity as much as desire.					
2.6. I feel that I have very few options to consider leaving this company.					
2.7. One reason that stop me from leaving this job at this company, that I will not find new job somewhere else.					

2.8. One of the major reasons I continue to work for this company is that I will not find another company that offer the same benefits I have here.					
---	--	--	--	--	--

3. Normative Commitment Scale (NCS)

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Normative Commitment Scale (NCS)	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
3.1. I think that people these days move from one Construction Company to another too often.					
3.2. I do not believe that a person must always be loyal to one Construction Company or one employer.					
3.3. I think it is ok, and it is ethical to jump from one Construction Company to another.					
3.4. One of the major reasons I continue to work in this company is that I believe loyalty to your recent employer is important and therefore feel a sense of moral obligation to remain					
3.5. If I got another offer for a better job elsewhere, I would not feel it was right to leave this company.					
3.6. I was taught to believe in the value of remaining loyal to one company and one employer.					
3.7. Things were better in the days when people stayed in one company for most of their careers.					
3.8. I do not think that to be a 'company man' or 'company woman' is sensible and important anymore.					

4. Organizational Commitment (OC)

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Organizational Commitment (OC)	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.9 This organization makes personal sense to me.					
1.10I feel a strong commitment for this organization.					
1.11I feel myself a member of the family in this organization.					
1.12I feel myself emotionally engaged to this organization.					

5. Absenteeism

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Absenteeism	Always	Very often	Sometimes	Rarely	Never
5.1. In the last week, how many times did you miss some hours of the total working hours (arrive late to work, or leave early)					
5.2. In the last month, how many times did you miss the entire workday because of health or physical problem?					

5.3. In the last month, how many times did you miss the entire workday because of other reason like annual leave?					
5.4. In the last month, how many times did you miss the entire workday because you did not feel to go to the work?					
5.5. In the last month, how many times did you come to the construction site early, go home late, or work on your day off?					

6. Work Alienation

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Work Alienation	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
6.1. I am not pleased about what I do in my organization; I spend time only to be paid					
6.2. It is a painful and boring experience to face my daily duties in my organization.					
6.3. For me working is rather drudgery or load.					
6.4. I feel myself detached/distanced in my organization.					
6.5. I wish I do a different thing.					
6.6. In time, I have become disappointed about my job.					
6.7. I do not feel to show better efforts in my job.					
6.8. I do not feel engaged to the events occurring around me in my organization (I do not care about anything).					

7. Job Performance

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

Job Performance	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
7.1. I always complete the tasks involved in the job description in my workplace.					
7.2. I fulfill my responsibilities as required by my job.					
7.3. I am not successful in fulfilling my basic tasks.					
7.4. I do not neglect the tasks as required by my job.					
7.5. I fulfill the formal tasks as required by my job.					

PART 2 Workers personal traits

1. Self-efficacy

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

I see myself as someone who	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.1 Look out for the safety of myself					

1.2 Look out for the safety of my co-workers					
1.3 Help a co-worker do a job more safely					
1.4 Identify a risky work behaviour of a co-worker					
1.5 Keep a safe place of work and still get the job done on time					
1.6 I Will stop a team member in my work area if I think they are doing something risky					
1.7 I will someone working outside my work area if I think they are doing something risky					
1.8 I will stop co-worker with more experience on the job than me if I think they are doing something risky					
1.9 Deal with most safety issues					
1.10I am a strong person and I will not have accident at work					
1.11I am at risk for accident while working, even if I regularly comply the safety rules					

2. Outcome Expectancy/Self-awareness

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

I see myself as someone who	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.12If I skip safety rules I will feel disappointed in myself					
1.13If I skip safety rules It is more convenient or easier to do my job					
1.14If I skip safety rules I will feel more comfortable					
1.15If I skip safety rules I will be injured					
1.16If I skip safety rules I will save time					
1.17If I not follow the safety rules at work, my colleagues will blame me					

3. Actively Caring behaviors

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

I see myself as someone who	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.18I observe co-workers safety-related behaviours					
1.19caution my co-workers if they are doing something risky					
1.20I give my co-workers safety-related feedback					
1.21In my opinion, discussing and exchanging the ideas with my colleagues about safe working is helpful to prevent accidents					

4. Attitude

INSTRUCTIONS: Please read each statement and rate your agreement on how you feel about each of the statement.

I see myself as someone who	Strongly agree	Agree	Undecided	Disagree	Strongly disagree

1.22 Compliance with safety rules at work is time-consuming					
1.23 Brave and strong men never use personal protective equipment (like helmets, safety gloves and . . .) while working					
1.24 Sometimes conditions such as heat or harassment resulted from safety					
1.25 equipment (like helmets, safety gloves and . . .) hamper me to work safely					
1.26 Sometimes it is necessary to disobey the safety rules at work to increase the production rate					
1.27 In my opinion, work accidents depend on the chance of individuals					
1.28 Safe working results in slow progress of the jobs					
1.29 I think work accident is a result of fate					
1.30 I tend to be disorganized in doing my work					
1.31 I tend to worry about my work					
1.32 I tend to be easy going while doing my job					
1.33 I tend to remain calm in risk and tense situations at my work place					
1.34 Before doing my work, I tend to make plans and follows through with them					
1.35 I only prefer works that is routine					
1.36 Sometimes in my work place I tend to be temperamental					
1.37 I tend to be nervous about my work					
1.38 I tend to argue a lot with my co-workers					

PART 3 Implementing H&S in construction sites

1 PPE

INSTRUCTIONS: Please think of the situations at your recent construction site work place then rate your agreement with the following statements

PPE	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.1 I Have my own PPE					
1.2 I use appropriate PPE every time I go to the site or perform a job					
1.3 I received proper training on how to use PPE, where to store it, and how to clean it					
1.4 My employer/responsible person is conducting appropriate inspection for all PPE					
1.5 I didn't pay for my PPE, and the company was responsible on all the costs					

2 First aid

INSTRUCTIONS: Please think of the situations at your recent construction site work place then rate your agreement with the following statements

First aid	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
2.1 First aid facilitates and boxes are available in the site and recognized with a first aid sign.					
2.2 First aid boxes at the worksites include all important and basic contents and they are cleaned and monitored regularly.					

2.3	First aiders and on-site medical providers' details and contact numbers are located in clear locations, where the first box is, and throughout the worksite.					
2.4	I receive proper information from my employer/supervisor regarding first aid in a clear language.					
2.5	I know where, how, and where to receive first aid or medical emergency treatment.					

3 Safety in heat

INSTRUCTIONS: Please think of the situations at your recent construction site work place then rate your agreement with the following statements

Safety in heat	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
3.1 I received good awareness on working in heat during summer months. And The company has informed me about the signs of heat illness.					
3.2 The company has informed me about the importance of keeping myself good hydrating and eating well during summer, and they are supplying appropriate food, and appropriate quantity of fluids (like potable water)					
3.3 The company is offering shade and cooling shelters for workers working outside during summer months					
3.4 I do not work middays during the months from (15 June till 15 Sept) outside.					
3.5 I have been provided with appropriate clothing (e.g. lightweight, cotton, light-colored) to use during summer.					

PART 4 General Information

Please provide the required personal details through marking a tick next to the answer of your choice

1. Job position	
<input type="checkbox"/>	Construction company owner
<input type="checkbox"/>	Supervisor
<input type="checkbox"/>	Worker
2. Gender	
<input type="checkbox"/>	Male
<input type="checkbox"/>	Female
3. Education	
<input type="checkbox"/>	Less than high school
<input type="checkbox"/>	High school
<input type="checkbox"/>	High diploma
<input type="checkbox"/>	Bachelors
<input type="checkbox"/>	Masters or above
4. Number of years worked in the current position	
<input type="checkbox"/>	1 - 5
<input type="checkbox"/>	5 - 10
<input type="checkbox"/>	10 - 20

	Above 20
5. Type of construction site	
	Residential building construction
	Industrial construction
	Commercial building construction
	Heavy civil construction
	Other, please specify.....

☐ Request for Information (a summary copy of the study will be provided)

Thank you for successfully completing this questionnaire.

Reliability tests

Affective Commitment scale reliability

The survey was conducted with 8 questions in this section. After checking the reliability test using Cronbach's Alpha, we ended with 5 questions.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.717	5

Item Statistics

	Mean	Std. Deviation	N
AC3	1.36	.794	461

AC4	2.63	.814	461
AC5	3.92	1.418	461
AC6	3.53	1.622	461
AC8	3.80	1.486	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
AC3	13.89	18.999	-.077	.806
AC4	12.61	14.760	.587	.658
AC5	11.32	10.118	.772	.525
AC6	11.71	11.418	.460	.690
AC8	11.44	10.130	.714	.552

Continuance Commitment scale reliability

RELIABILITY

/VARIABLES=CC1 CC2 CC3 CC4 CC5 CC6 CC7 CC8

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.791	8

Item Statistics

	Mean	Std. Deviation	N
CC1	2.77	.800	461
CC2	2.23	.766	461
CC3	2.86	.754	461

CC4	3.21	1.069	461
CC5	3.26	1.182	461
CC6	3.36	2.123	461
CC7	3.44	1.055	461
CC8	2.86	.955	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
CC1	21.22	31.586	.344	.789
CC2	21.76	32.681	.234	.800
CC3	21.14	29.679	.617	.762
CC4	20.79	26.588	.688	.740
CC5	20.74	25.117	.743	.727
CC6	20.64	22.336	.422	.834
CC7	20.55	26.391	.721	.735
CC8	21.13	28.395	.591	.758

Normative Commitment scale reliability

RELIABILITY

/VARIABLES=NC1 NC4 NC5 NC6 NC7 NC8

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	460	99.8
	Excluded ^a	1	.2
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.670	6

Item Statistics

	Mean	Std. Deviation	N
NC1	2.19	.673	460
NC4	2.11	.732	460
NC5	1.92	1.119	460
NC6	2.77	.702	460
NC7	2.19	.672	460
NC8	3.11	.878	460

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
NC1	12.10	7.739	.202	.684
NC4	12.19	6.411	.541	.583
NC5	12.37	5.406	.441	.625
NC6	11.52	7.065	.373	.638
NC7	12.10	6.150	.705	.538
NC8	11.19	6.982	.258	.680

Organizational Commitment scale reliability

RELIABILITY

/VARIABLES=OC1 OC2 OC3 OC4

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.910	4

Item Statistics

	Mean	Std. Deviation	N
OC1	1.72	1.101	461
OC2	1.41	.849	461
OC3	1.48	.879	461
OC4	1.72	1.043	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OC1	4.61	6.620	.724	.916
OC2	4.92	7.527	.792	.888
OC3	4.85	7.332	.805	.882
OC4	4.61	6.182	.900	.844

Absenteeism scale reliability
RELIABILITY

/VARIABLES=AB1 AB2 AB3 AB4 AB5

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.777	5

Item Statistics

	Mean	Std. Deviation	N
AB1	4.67	.901	461
AB2	4.64	.855	461
AB3	4.14	.788	461
AB4	4.40	.978	461
AB5	4.24	1.171	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
AB1	17.42	7.692	.673	.695
AB2	17.45	7.479	.782	.663
AB3	17.95	8.628	.565	.735
AB4	17.70	8.103	.504	.752
AB5	17.85	8.193	.344	.825

Work Alienation scale reliability

RELIABILITY

/VARIABLES=WA1 WA2 WA3 WA4 WA5 WA6 WA7 WA8

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.949	8

Item Statistics

	Mean	Std. Deviation	N
WA1	4.08	1.221	461
WA2	4.45	.816	461
WA3	4.53	.690	461
WA4	4.46	.829	461
WA5	4.02	1.234	461
WA6	4.38	.919	461
WA7	4.32	1.007	461
WA8	4.48	.853	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
WA1	30.63	31.437	.798	.946
WA2	30.27	34.905	.860	.941
WA3	30.18	36.529	.822	.945
WA4	30.25	34.659	.872	.940
WA5	30.69	31.030	.822	.945
WA6	30.34	34.120	.829	.941
WA7	30.39	32.612	.889	.937
WA8	30.23	35.306	.772	.945

Job Performance scale reliability

The survey was conducted with 5 questions in this section. After checking the reliability test using Cronbach's Alpha, we ended with 4 questions.

RELIABILITY

/VARIABLES=JP1 JP2 JP4 JP5

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.834	4

Item Statistics

	Mean	Std. Deviation	N
JP1	1.41	.796	461
JP2	1.26	.767	461
JP4	1.57	1.058	461
JP5	1.39	.674	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
JP1	4.22	4.545	.674	.787
JP2	4.37	4.681	.662	.793
JP4	4.05	3.961	.567	.865
JP5	4.24	4.539	.860	.727

Self-Efficacy scale reliability

RELIABILITY

/VARIABLES=SE1 SE2 SE3 SE4 SE5 SE6 SE7 SE8 SE9 SE10 SE11

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	459	99.6
	Excluded ^a	2	.4
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.860	11

Item Statistics

	Mean	Std. Deviation	N
SE1	1.22	.667	459
SE2	1.24	.743	459
SE3	1.31	.789	459
SE4	1.29	.772	459
SE5	1.33	.759	459
SE6	1.40	1.228	459
SE7	1.55	.982	459
SE8	1.54	.828	459
SE9	1.66	.808	459
SE10	1.92	1.249	459
SE11	2.31	.822	459

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
SE1	15.54	34.755	.685	.843
SE2	15.53	33.010	.823	.832
SE3	15.46	32.629	.814	.831
SE4	15.47	32.512	.850	.829
SE5	15.44	33.255	.772	.835
SE6	15.37	33.665	.380	.869

SE7	15.22	31.742	.713	.835
SE8	15.23	33.132	.710	.838
SE9	15.11	34.253	.601	.846
SE10	14.85	35.407	.244	.883
SE11	14.46	39.786	.012	.883

Outcome Expectancy/Self-Awareness scale reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.839	4

Item Statistics

	Mean	Std. Deviation	N
OE1rev	3.5830	.84116	458
OE3rev	1.6310	.89570	458
OE4rev	2.3603	1.55677	458
OE6rev	2.3537	1.53778	458

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OE1rev	6.3450	12.209	.690	.813
OE3rev	8.2969	12.857	.516	.859
OE4rev	7.5677	7.721	.789	.747
OE6rev	7.5742	7.457	.851	.709

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
9.9279	16.973	4.11982	4

Actively Caring Behaviours scale reliability

RELIABILITY

/VARIABLES=ACB2 ACB3 ACB4

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	459	99.6
	Excluded ^a	2	.4
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.931	3

Item Statistics

	Mean	Std. Deviation	N
ACB2	1.45	.650	459
ACB3	1.47	.638	459
ACB4	1.41	.681	459

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
ACB2	2.87	1.530	.907	.861
ACB3	2.86	1.589	.881	.883
ACB4	2.92	1.588	.792	.955

Attitude scale reliability

RELIABILITY

/VARIABLES=Attitude1 Attitude2 Attitude3 Attitude4 Attitude5 Attitude6 Attitude7 Attitude8

Attitude9 Attitude10 Attitude11 Attitude12 Attitude13 Attitude14 Attitude15 Attitude16 Attitude17

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	459	99.6
	Excluded ^a	2	.4
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.704	17

Item Statistics

	Mean	Std. Deviation	N
AT1	2.39	1.553	459
AT2	4.29	1.080	459
AT3	4.23	1.119	459
AT4	4.41	.886	459
AT5	3.52	2.708	459
AT6	3.43	1.632	459
AT7	4.35	1.030	459
AT8	4.33	1.008	459
AT9	4.32	.854	459
AT10	4.30	1.032	459
AT11	3.83	1.349	459
AT12	2.95	.651	459
AT13	1.81	.883	459

AT14	2.24	.928	459
AT15	3.98	1.167	459
AT16	4.23	.969	459
AT17	4.40	.791	459

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
AT1	60.63	91.768	-.544	.789
AT2	58.72	67.285	.538	.668
AT3	58.78	64.500	.681	.652
AT4	58.60	66.568	.736	.658
AT5	59.49	73.469	-.061	.791
AT6	59.58	68.690	.245	.700
AT7	58.66	65.967	.655	.659
AT8	58.68	66.265	.653	.660
AT9	58.69	67.818	.671	.665
AT10	58.71	65.305	.696	.655
AT11	59.19	63.164	.606	.653
AT12	60.06	78.097	-.047	.713
AT13	61.20	79.175	-.125	.723
AT14	60.77	78.476	-.082	.721
AT15	59.03	64.276	.660	.653

AT16	58.78	67.016	.632	.663
AT17	58.61	68.230	.699	.665

PPE scale reliability

RELIABILITY

/VARIABLES=PPE1 PPE2 PPE3 PPE4 PPE5

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.811	5

Item Statistics

	Mean	Std. Deviation	N
PPE1	1.57	.931	461
PPE2	1.21	.557	461
PPE3	1.23	.579	461
PPE4	1.26	.622	461
PPE5	1.43	.827	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PPE1	5.13	5.012	.353	.877
PPE2	5.49	4.977	.831	.724
PPE3	5.47	4.911	.821	.723
PPE4	5.44	4.821	.786	.726
PPE5	5.28	4.918	.477	.819

First Aid scale reliability

RELIABILITY

/VARIABLES=FirstAid1 FirstAid2 FirstAid3 FirstAid4 FirstAid5

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.953	5

Item Statistics

	Mean	Std. Deviation	N
FirstAid1	1.25	.603	461
FirstAid2	1.29	.630	461
FirstAid3	1.26	.669	461
FirstAid4	1.26	.640	461
FirstAid5	1.23	.608	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
FirstAid1	5.04	5.555	.861	.944
FirstAid2	5.00	5.539	.819	.951
FirstAid3	5.02	5.202	.891	.939
FirstAid4	5.03	5.269	.915	.934
FirstAid5	5.06	5.523	.865	.943

Safety in the heat scale reliability

RELIABILITY

```
/VARIABLES=SafetyHeat1 SafetyHeat2 SafetyHeat3 SafetyHeat4 SafetyHeat5
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

/STATISTICS=DESCRIPTIVE

/SUMMARY=TOTAL.

Case Processing Summary

		N	%
Cases	Valid	461	100.0
	Excluded ^a	0	.0
	Total	461	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.896	5

Item Statistics

	Mean	Std. Deviation	N
SafetyHeat1	1.30	.598	461

SafetyHeat2	1.26	.598	461
SafetyHeat3	1.27	.618	461
SafetyHeat4	1.38	.888	461
SafetyHeat5	1.31	.695	461

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
SafetyHeat1	5.22	5.596	.848	.855
SafetyHeat2	5.26	5.614	.842	.856
SafetyHeat3	5.24	5.545	.834	.856
SafetyHeat4	5.14	5.294	.557	.935
SafetyHeat5	5.21	5.383	.772	.867