AN ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY KNOWLEDGE OF CONSTRUCTION SITE MANAGEMENT TEAM IN TANZANIA

(Case study: Mwanza City)

William M. Kidayi

M.Sc. (Construction Economics and Management) Dissertation

Ardhi University, Dar es Salaam

November, 2017

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Ardhi University, a Dissertation entitled **Assessment of Occupational Health and Safety Knowledge of Construction Site Management Team in Tanzania Case study of Mwanza City** in partial/fulfillment of the requirements for award of the degree of Master of Construction Economics and Management of Ardhi University.

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Dr. S. Phoya

(Major Supervisor)

Date: ……

DECLARATION

I,**William M Kidayi** declare that this research is the result of my own original work and it has not been presented and will not be presented to any other academic institutions in a similar or any other award.

Signature.....

DEDICATION

I dedicate this work to my lovely parents and the whole family who gave me a lot of support when I was doing this research.

To all my friends and my fellow students who contribute their ideas in one way or another in the accomplishment of this research paper.

Thank you all from the bottom of my heart.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my gratitude, honor heart thanks to Almighty God for giving me good health, courage and strength throughout my fieldwork and by his grace and helping hand enable me to work well.

I am indebted to so many people and institutions to the extent that it is not possible to accord them due credit. However, I would like to extend my sincere and grateful thanks to my supervisor Dr.Phoya for her constructive ideas and directions which led me through my proposed research up to my research report.

I would like to thank all staff members of Building Economics department and the School of Construction Economics and Management at Ardhi University for their advice throughout my Master's degree study.

Lastly, I would like to appreciate the moral support and encouragement from my best friends, classmates, brothers and sisters. May God bless them with success and happiness in their lives GLORY BE TO GOD.

ABSTRACT

The construction industry is animportant sector in Tanzania that drivesthe growth and productivity of the economy. Despite its importance, it is characterized with the reputation of being dangerous and highly hazardous. However, studies on occupational health and safety knowledge of construction sites management is quite limited. This study was conducted in selected construction sites in Mwanza city with a specific focus on health and safety knowledge required, the way it is acquired and transferred, challenges in acquiring and transferring and knowledge transfer mechanism to mitigate the challenges for construction site management team. In pursuing these objectivesthe survey methodswas adopted on the selected construction sites in Mwanza. This study used fifty-five respondents to obtain necessary information concerning the occupational health and safety knowledge of construction sites management. The findings shows that, construction site management team mainly require more knowledge on communication and risk management. The communication facilitates the acquisition of knowledge and ability to report health and safety issues to effectively manage risk. The ways health and safety knowledge are transferred and acquired were through informal discussions, collaboration, and demonstration. Also, the challenges faced by construction site management team in acquiring and transferring health and safety knowledge were lack of knowledge on risk assessment, equipment and risk nature of construction site. The mitigation measures on the challenges in acquiring and transferring health and safety knowledge of construction site management team were the provision of knowledge on risk assessment, equipment and increases qualification of construction site management team. Finally, this study recommended that health and safety policy should encourage on the communication and control risk on behalf of the construction site management team. It needs to state and supervise the control and management of risk to promote health and safety of construction site management team.

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LIST OF ABBREVIATIONS

AQRB	Architects and Quantity Surveyors Registration Board
CM	Construction Management
CSMT	Construction Site Management Team
GDP	Gross Domestic Product
ILO	International labour Organization
KM	Knowledge Management
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Authority
PCMs	Professional Construction Managers
PPE	Personal Protection Equipment
QS	Quantity Surveyor
SPSS	Statistical Package for Social Science
USA…….	United States of America

CHAPTER ONE

1.1 Introduction

The main focus of the research is to assess the occupational health and safety knowledge to the site management team in Construction Site. This chapter provides a background of the problem, statement of the problem, the objective of the study (general and specific objectives), research question and the significance of the study and Scope of the study.

1.2 Background of the Problem

Globally, there is a rapid change of the business environment under which the construction industry operates (Cheng, *et al.* 2010). In most cases construction organizations that fail to adapt the business environment change experience survival problems (Lee *et al.* 2001).

The construction industry has remarkably impact to the economy and its growth. Following this, it is believed to employ more than 7% of the world's entire workforce and contributes to more than a 10th of the global GDP. It currently shows increasing trends, not only in terms of volumes of work done but also in terms of the complexity of construction projects (OSHA Tanzania, 2013). Generally, it contributes to the economy in terms of capital formation, production of capital facilities, and the creation of employment for the Site Management Team (Fung, *et al.* 2010).

Despite its importance, the construction industries of most developing countries considered as extremely hazardous due to frequent non-fatal and fatal injury's occurrence based on its unique nature (Samson and Lema 2005).

The building construction activities are inherent with problems associated with health and safety risk factors, including working at height, underground, in confined spaces and close proximity to falling materials, handling loads manually, handling hazardous substances, noise, dust, using plant and equipment, fire and exposure to live electrical cables (Phoya, 2012).

To manage these risk factors one should have knowledge in assessing and controlling them. Several studies have established that there is a linkage of health and safety knowledge of construction site management team. Misnan, Mohammed, Mahmood, Mahmud and Abdullah (2008) basically identified ten elements that influenced the development of safety culture. The training on the use of equipment pressed high priority on safety issues.

The construction industry provision of effective training for transferring and acquiring occupational health and safety knowledge of construction site management team need more improvement. Furthermore, the findings of the study conclude that construction firms and safety experts are required to ensure training and education are of great influence in the developmentof health and safe knowledge (Misnan *et al,* 2008*).*

Occupational Health and safety knowledge is the confined issue among the researchers. Improvement of health and safety issues through the respective knowledge provision expected to reduce the accident and health problem in construction sites.

Site management teams are in charge of production at the site. In this context, collaboration with stakeholders, clients, subcontractors and consultants is vital for production process. They have also to ensure that project is executed with zero accidents. The site management ability to understand the present situation on health and safety risks and maintain control is the important attribute. The construction site management team required to recruit laborers, supervise workers, plan the work, and communicate to workers by holding the meeting regarding health and safety issues at least once per month (Abdul, 2009).

The performance of the construction industry in Tanzania is highly affected by the occupational health and safety issues of construction site management team. There are increasing worries on the knowledge and ability related to health and safety of construction site management team. The health and safety proficiency on the occupational health and safety of construction site management team generally need further research. There is a need on the respective improvement of occupational health and safety knowledge in the Tanzania construction industry (Phoya, 2012).

Occupational Health and Safety knowledge is the condition of being protected against physical, psychological, emotional, and financial or any other type of

consequences. In fact, lack of occupational health and safety knowledge leads to damage, error, accident, harm or any other event which could be considered non-desirable (Giang, *et al.* 2010).

The ConstructionSiteManagement Team is basically associated with limited knowledge on occupational health and safety that could ensure adequate protection in the event of exposure, purposely to avoid health and economic losses in the construction industry (Smallwood and Haupt, 2008).

Also, in Tanzania like many other developing countries, the construction site management team are vulnerable to hazards occupational diseases and injuries that almost occur due to the use of machinesat construction sites (Kikwasi, 2010).

The practice of construction site activity is likely to put pressure on the nature of work, the use of machines, plants, and other construction equipment. In fact, the construction industry has the reputation of being dangerous and highly hazardous. This mostly associated with high accidents and severe injuries for construction site management team, the nature of working conditions and institutions also are challenging on the adequate occupational health and safety of construction site management team (Kitumbo and Kirenga, 2001).

Several initiatives are in place on increasing health and safety knowledge of construction site management team. These initiatives include in section 27 Of OSHA

Acts 2003 that all workers should be provided with health and safety induction, safety orientation.

Another initiative is the inclusion of health and safety module to the students venturing constructed in their curriculum, despite these initiatives, little is known regarding to health and safety knowledge of the construction site management team. This study, therefore, focused on the occupational health and safety knowledge of construction site management team in Tanzania construction industry.

In view of this study was conducted in the occupational health and safety knowledge in the construction industry of Tanzania, more particularly in Mwanza where construction activities observed with occupational health and safety knowledge in construction activity of construction site management team.

1.3 Statement of the Problem

The construction industry in Tanzania is the driver of growth and productivity of the economy, as it contributes 8.0% to the national GDP (National budget 2011/2012). In Tanzania,the construction industry has reputation of being dangerous and highly hazardous. This unfortunate scenario becomes a threat to the productivity and performance of construction projects in the economy of Tanzania.This mostly associated with high rate of accidents, deaths, permanent disabilities and severe injuries in construction sites (Kitumbo and Kirenga, 2001). The occupational health and safety knowledge for construction site management team generally need further research (Phoya, 2012).While Site Management Team are in charge of all activities

in construction site including attaining zero accident, their knowledge on health and safety is questionable.Once the problem remains unsolved for a long time, there is a possibility of more accidents occurance and several injuries because of limited health and safety knowledge for construction site management team. This study, therefore, aims to assess the occupational health and safety knowledge for construction site management team.

1.4 Objective

1.4.1 General objective

The overall objective was to assess the occupational health and safety knowledge of construction site management team in Tanzania construction industry in selected construction sites in Mwanza city.

1.4.2 Specific Objectives

i. To determine health and safety knowledge required of construction site management team.
ii. To examine the way health and safety knowledge is acquired and transferred to construction site management team.
iii. To determine the challenges faced by the construction site management team in acquiring and transfer health and safety knowledge.
iv. To propose effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge to construction site management team.

1.5 Research Questions

i. What are the required health and safety knowledge areas?

ii. How is health and safety knowledge acquired?

iii. What are the challenges faced in acquiring and transferring health and safety knowledge?

iv. What is the knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge?

1.6 Significant of the Study

This study will make a remarkable contribution to policy formation, knowledge building, decision making and alert the construction project stakeholders.

i. Following this, policy formation this study will facilitatethe health and safety knowledge of construction site management team, the policy will strictly state and ensure its strict implementation of the knowledge of construction site management team in terms of duration of its update and the means for inspection of the construction sites.

ii. This study will build knowledge to other researchers and academician specifically in the field of health and safety knowledge under the construction industry. Also, it will help to identify the gap left, hence provide a room to undertake the similar study to fill the gap.

iii. The decision makers, generally in vital of their position will make decision that focuses on the health and safety knowledge and several inspections of

site before provision of building permit. Also, their decision will direct the means of protecting the constructionsite management team.

iv. The findings will enable the construction site management team to be aware on the performance of occupational health and safety knowledge of construction site management tearm.

1.7 Scope of the study

This study covered the construction industry, specifically on the occupational health and safety knowledge of construction site management team in Mwanza City. It covered 15 on going construction sites. This on-going construction sites facilitated to obtain relevant and current information on occupational health and safety knowledge of construction site management team.

1.8 Organization of the Dissertation

This dissertation has five chapters: The first chapter deals introduction and background of the problem, statement of the problem, theobjective of the study, research questions, significance of the study, In order to meet the objectives of this study Chapter two discussed different literature and theories. Also, it came up with various empirical literature reviews to provide more explanation and insight related to this study.

The approaches of conducting the study are clearly presented in chapter three where the ways of data collection and analysis were presented, later on, the reliability and validity of data to insure consistency of the study.

Chapter four presented the findings that seek to answer the research questions were governed by the research objectives that provides the direction that was presented in chapter one. Finally, chapter five deals with general picture obtained in the findings to come up with the conclusion and recommendations. The next chapter will cover literature review.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter includes a review of the present literature related to the study, discusses published information in a particular subject area and sometimes information in a particular subject area within a certain time of period. It discloses the theoretical and empirical factors.

This section carefully reviews the scholarlyliterature on occupational health and safety knowledge of construction site management team. It provides an extensive and sufficient guide for the research and to assist other researchers who seek to replicate more deeply into this study topic. It is presented high-quality studies and articlesrelated to occupational health and safety knowledge of construction site management team.

2. 1 Definitions of Key concepts

2.1.1 Construction

Construction is the process of preparing and forming buildings based on the well-established building systems. Construction starts with planning, design, and financing on a continuing basis for the accomplishment of building structures on the grounds (Samson and Lema, 2002).

Far from being a single activity, large scale construction is highly involving of large tasks and activities. Normally, the job is managed by a Project Manager and well supervised by a construction manager, design engineer, construction engineer or

project contractors. For the successful execution of a construction project, effective planning needs to mobilize at sites. Also, McIntyre and Strischek (2005) argued that in the design and execution activities of infrastructure basically consider the zoning requirements, the environmental impact of the job, the successful scheduling, budgeting, construction site safety, availability and transportation of building materials, logistics, inconvenience to the public caused by construction delays and bidding.

Construction is a high hazard with activities that involving construction, alteration, and/or repair. Such as residential construction, bridge erection, roadway paving, excavations, demolitions, and large scale painting jobs (Halpin and Bolivar, 2010). The constrction site management team engages in many activities that may expose them to serious hazards, such as falling from rooftops, unguarded machinery, being struck by heavy construction equipment, electrocutions, silica dust, and asbestos (McIntyre and Strischek, 2005).

The construction activities require advancement in term of information, tools and resources to secure construction site management team from construction hazard. The construction site management team need information to update their understandingin health and safety knowledge of construction sites (OSHA's, 2012). Without such knowledge almost are becoming vulnerable under the construction industry. Generally the nature of construction activity is less advanced in most of the developing countries due to low capital and technological base. From this perspective becomes increasingly vulnerable at the construction sites. Following this

line of understanding the protective gears are concerned to the respective development in the construction activity.

2.1.2 Assessment

Assessment is defined as the nature of checking the quality or estimation of someone or something, in construction activities assessment generally referred as the evaluation of the occupation health and safety knowledge, based on the requirement of the construction industry. Also assessment can be termed as the act of judging or deciding the amount, value, quality, or importance of something (European Union, 2011) .

2.1.3 Health

Health is the fuction of the bodies and minds of people from illness resulting from the materials process or procedures used in the workplace (Phil, 2007).

2.1.4 Safety

Safety is the protection of people from physical injuries, the body lines between health and safety is defined and the two words are normally used together to indicate concern for the physical and mental wellbeing of the individual at the place of work. (Phil, 2007).

2.1.5 Occupational

Occupational is concerned with the illness or physical and mental disorders that are either caused or triggered by workplace activities. Such condition may be induced by

the particular work activities of the individual or by activities of others in the workplace (Phil, 2007).

2.1.6 Knowledge

Knowledge is familiarity, awareness or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning *(*Eddy, 2013*).*

Another scholar considers knowledge as a skill that you get from experience or education, the acquaintance with facts, truths, or principles, as from study or investigation, the construction site management team in this context require knowledge on the health and safety issues for protecting their health and dangers of harm. Knowledge gives us the power to take action. There are two types of knowledge explicitly knowledge and tacit knowledge (WHO, 2001).

Explicitly knowledge includes the thing that you can easily pass on to someone else by teaching it or putting it into a database or a book. Example explaining your company's safety protocols to a new team member is demonstrating explicit knowledge. Tacit knowledge is less quantifiable in the most often learned by experience (Podgorski, 2010).

The knowledge phenomenon in the organization being the case developed by prominent individuals to provide insight for the knowledge management. The experience provided by Taylor in 1911, throughout the scientific management

concept. It is more relevant on the importance of behavioral knowledge inthe management process under the organization performance.

Also on the concept of knowledge worker arrived with the clear development of the term knowledge. The knowledge also developed through various prominent which including Argyris and Schos (1978) and Senge's (1990), seriously attempted to explain the knowledge at the organization level.

The term knowledge was explained differently by various authors, but common knowledge related to the process that involve human action. In the other way around knowledge recognized as the human process that is dynamic on explaining the personal beliefs towards the truth. The knowledge creation basically attached to the flow of information that connected with beliefs and commitments (Nonaka and Takeuchi, 1995) - thus emphasizing that knowledge is essentially related to human action.

Knowledge also recognized as an organized combination of data and information organized in a certain rules, procedures and operations that captured through human experience and practice (Bhatt, 2001). The knowledge basically resulted from a set of information to convert information, on the other hand, knowledge recognized as something that someone has and can justify by arguments, reasons to indicate its trueness and validness on the context of knowledge use.

Knowledge is basically attached to the meaning conveyed in the mind and without meaning knowledge considered as information or data (Bhatt, 2001). According to

Nonaka and Takeuchi (1995) who provided a thorough combination of traditional epistemology and the Western epistemology knowledge was recognized as a variation infocus. The traditional epistemology defined knowledge as justified true belief that focuses on the truthfulness.The western epistemology put much emphasize that, knowledge is absolute, static and non-human nature expressed in forms of propositions and logic. Also, Nonaka and Takeuchi (1995) argued that, knowledge related to human action and experience on specific situation of human interaction.

2.1.7 Management

Management is defined as the ability to organize or coordinating the various activities to achieve the desired goal or objectives (Konthari, 2004)

2.1.8 Construction Management

Construction Management is a professional discipline applied to construction planning, design, and process. Professional construction managers (PCMs) address the needs of owners by providing management services and expertise tailored to the project, independent of the chosen contract format or project delivery method. PCMs apply comprehensive project controls to help manage the critical issues of time, cost, scope, quality, and safety. They can help improve worker safety by integrating safety and health into all aspects of the construction process, from the design phase to jobsite management.(Phil, 2007).

2.1.9 Team

A team is defined as a group of people with different skills and different tasks, who work together on a common project, service or goal with a meshing of functions and mutual support (Phil, 2007).

2.1.10 Management Team

A managementteam is defined as the organized group of people to plan, coordinate and organize the resources to achieve the intended goal in agreed time frame.

Every construction organization should have a clear policy for the management of occupational health and safety knowledge for attaining its health and safety objectives. For the policy to be effective, it must be honored in the sprit as well as the letter. A good health and safety policy will also enhance the performance of the organization in areas other than health and safety, help with the personal development of the workforce and reduce financial losses. It is important that each construction site throughout the organization is aware of the policy

2.1.11 ConstructionSite Management Team

Construction site management team is the organized group of people to achieve the construction purpose with the resources and time frame. It basically, refers to organizeconstruction workers at the site to perform various duties and task based on the requirement of construction activity at the site. It basically includes the site foremen, site engineer and site managers until the building are accomplished in various standards and requirements (Richardson, 2008).

The role of construction site management team is the overall planning, coordination and control of a project from inception to completion and is aimed at meeting the client requirement in order to produce a functionally and financially viable project based on time schedule and cost requirements.

There are various duties and tasks need to be played by the constructionsite management team, at the respective site. The basic schedule needs to be essentially organized by the site managers such as supervise the whole activities at the site, based on the health and safety requirement.

The site foremen possess all site requirements and watch in basic attainment on the indicated schedule of activities. The site engineer is there at the site with a number of responsibilities including solving technical issues, providing advice, management and preparing reports and Travel purposely for visiting sites and clients is integral to the job.

2.1.12 Knowledge management

Knowledge management is the practice of organizing, storing and sharing vital information so that everyone can benefit from its use. The major benefit of knowledge management is that information is easily shared between a staff member and that knowledge is not lost if someone goes on vacation, gets sick or leave the site. Knowledge management also creates a more powerful workforce and staff member do their jobs better and more productive.

2.1.13 Occupational Health and Safety Knowledge

Generally, this is information and skills that relate to preserving or maintain people free from illness and injury (Murie, 2007). OHS Knowledge is basically attached to the impartation of knowledge and understanding on the health and safety issues that are required at working environment, working tools, machines, working stations and the workers, such understanding aimed to prevent, assess and control the hazard from its occurrence based on the environment and the work context such as in prevention of accidents, occupational diseases, injuries and damages.

According to ILO (2005), construction workers with occupation health and safe knowledge tend to produce high-quality and international standards construction building. The well-advanced building knowledge has strong partnerships with knowledge based on agencies, institutions, and organizations. In fact, the OHS knowledge basically seeks to mobilize and facilitate knowledge and information in terms of sharing through networking activities and build institutional capacity. The basic issues originate on the ability to acquire and use knowledge for construction industry development.

2.2 Roles of construction site management team

The construction site management team should basically include a site manager, site engineer, and Quantity Surveyor and Site foremen.The role of construction site management team, is presented as follows**;**

2.2.1. Site manager

The site manager should oversee operations on a day-to-day basis, and ensure that work is done safely, on time and within budget and to the right quality standards. It should be responsible for all site activity and report accordingly to more senior managers.

The Site Manager should also prepare the site, carefully planning the work to be done and installing temporary offices for site staff.

A Site Manager will keep in close contact with members of their site team at all times, basically, should comply with building regulations and health and safety legislation as well as other legal requirements.

Also,a Site Manager keeps the client updated regularly on works progress. Finally, a Site Manager also acts as the first point of contact for members of the public and sub-contractors. It is the responsibility of the Site Manager to make sure that, the deadline for completing work is met. A site manager need at least to share some of the responsibilities to others workers to fill existing shortage while accommodating health and safety requirements. This situation allows Site Manger to review and monitor staff progress towards achieving health and safety objectives.

2.2.2. Site engineer

A site engineer offers advice in the planning, coordination, and supervision of technical aspects of construction projects.

A Site Engineer role is vital to a construction project: they have a number of responsibilities, including solving technical issues, providing advice, management and preparing reports. The skill of health and safety officers enforce personal protection equipment requirement, basically make sport check to determine that hard at and other PPE, are being used and periodically apply the condition of equipment.

The employee injuries contribute to works delay, in the caseof serious injuries the injured employ receive prompt medical attention. The areas are required to be isolated or shut down the equipment as necessary and immediately report to the site manager, the facts mainly are rooted regarding the employee's accidents or action to the wider majority of the construction site management team.

These injuries are contributed by accidents due to missuse of occupational health and safety principles. The works assigned to employees need a thorough investigation of all elements of accidents. This provides more room for employees to accomplish the assigned work areas safely.

2.2.3. Quantity surveyor

A Quantity surveyor (QS) is a professional concerned with a building cost in the construction industry, usually, report to site manager. Typical duties and activates taken by QS include cost control, valuations, feasibility studies and cost benefit analysis.

Quantity surveying on the site are highly associated with calculating the cost based on the requirement of health and safety; basically, have to quantify the requirement

in the improvement health and safety of the employees. The calculated cost and materials are required to be of friendly occupation health and safety.

2.2.4. Site foreman

A site foreman is a second management level and has a further role as a coordinating manager and client interface. The Site Foreman has the following specific areas of responsibility; safety, leadership and supervision, planning and scheduling, administration, quality control and employee relation (Bhatt, 2001). The site foreman needs to have knowledge on the occupational health and safety to facilitate effective communication at construction sites. This increases the ability of planning and monitoring occupation health and safety agenda.

2.2.5. Safety officers

Safety officer, is the person under the legal inspection of health and safety issues, he/she has responsibilities to monitor and control any hazard environment and risk regarding human health (Charles, 2011). Safety officers promote occupational health and safety within organizations in many ways including**;**

2.2.5.1 Reducing equipment downtime

The ability of reducing equipment downtime deals with equipment and prevents the damage and destruction, and generally prevents all the equipment to remain idle, generally make sure that all equipment is in use all the time, the application of equipment increase the ability to handle respective challenge and even provide the dimension of the knowledge among the construction site management team.

2.2.5.2 Securing savings on insurance premiums

The health and safety officers are planning to secure all insurance premiums on the respective health and safety, insurance, the insurance premium are determining the health and safety, compensation in case any health disruption occurs, the health and safety officers are responsible for ensuring the compensation are well done based on the right premium collected (Walters, 2009).

2.2.5.3 Securing the savings in workers compensation

The savings on the worker's compensation is highly secured and even protected for the efficiency, ability owned by the health and safety officers, generally, has the right to offer and control all the compensations.

2.2.5.4 Conduct inspections and inform the management

They conduct inspections and inform the management the respective that is in compliance with government laws or employer policies (Podgorski, 2010).

2.2.5.5 Advise management on the cost and effectiveness of safety and health programs

They advise management on the cost and effectiveness of safety and health programs, in fact, the management needs to be alerted on the respective health programs, to ensure adequate knowledge on health issues for construction site

management team. From this experience, the safety officers are responsible to coordinate all health programs and its implementation on the construction sites (Tam *et al*, 2004).

2.2.5.6 Implements and evaluates programs designed

They help implements and evaluates programs designed to limit risks to workers, the implementation basically need close supervision that is within the ability and authority of safety officers, the programs need to be evaluated and well designed in the professional manners, to meet the objective and aim of ensuring occupational health and safety knowledge in the construction sites (Walters, 2009).

2.2.5.7 Identifying hazardous conditions and practices

They focus on identifying hazardous conditions and practices, the respective condition and environment at the construction sites are well planned and controlled. The condition requires appropriate procedures with anefficient mechanism for health and safety provision. The safety officers are well equipped to ensure all practices and mechanism are in thepress to manage the construction sites on health and its respective risk (Chan, 2009).

2.2.5.8 Develop methods to predict hazards

They develop methods to predict hazards from experience, historical data, workplace analysis and other information sources, it is important to ensure well means for

preparedness on hazardous condition and way out to deals with, such a responsibility remain to be under safety officers, to ensure adequate prediction to alert the construction site management team and ensure appropriate responses towards the acquisition of occupational health and safety knowledge (Eliufoo, 2005).

2.2.5.9 Identify potential hazards

They identify potential hazards in systems, equipment, products and facilities, the potential hazard for the construction industry required to be well prevented and evaluated in terms of risk, the equipment need to be well controlled and managed to the life prevention of construction site management team, in this pace where the construction industry are undergoing modification and well supervision, the knowledge on occupational health and safety for construction site management team needs to be empowered with the existing safety officers (Chi and Wu, 1997).

2.2.5.10 Identify controls to reduce or eliminate hazards

They identify where controls need to be implemented to reduce or eliminate hazards and advice for a new programs or practices, the hazard in construction site almost need appropriate control, this is paramount in the elimination or reduction of the accidents rate at construction sites, almost the introduction of technology in the construction industry should adequately related with the introduction of occupational health and safety knowledge to handle the environment. The safety officers are responsible for providing advice on new programs to provide safe working environment for construction site management team (Charles, 2011).

2.2.5.11 Conduct training sessions for construction site management team

They conduct training sessions for construction site management team on health and safety practices and regulations. The construction site management team is required to be alerted on the ways and means of handling equipment at sites. The safety officers respectively provide shared understanding and knowledge to reduce accidents and all site problems among the construction site management team (Abdul, 2009).

2.2.5.12 Monitor and evaluate the program progress

After implementation, they may monitor and evaluate the program progress, making additional suggestions when needed, the implementation of health and safety programs need close follow and supervision with professional staffs, such as the safety officers to thepromotion of zero accidents at construction sites (Brown and Adams, 2000).

2.2.5.13 Ensure machinery and equipment meet appropriate safety regulations

To ensure the machinery and equipment meet appropriate safety regulations, it is clear that are responsible for examining and testing machinery and equipment such as lifting devices. Machine guards or scaffolding need to be well inspected before use or in the application, this basically is essential for provision safe working environment for construction site management team (Bukowitz and Williams, 2000).

2.2.5.14 Check personal protective equipment

They may check that personal protective equipment, such as masks, respirators, protective eyewear all these equipment being used in the site based on the requirement of laws and regulations. The use of protective equipment is the responsibility for both construction site management and construction firm entrusted to work for, this general truth need a close supervision and inspection of safety officers (Chen and Mohamed, 2008).

2.2.5.15 Check hazardous materials storage

They also check that hazardous materials are stored correctly, the failure of appropriate ways and mechanism to handle hazardous materials also may harm the health of construction site management team. The safety officers have owned means and knowledge to handle all hazardous material, in that respect are the one who shares with construction site management team in various ways, such as seminars and training on the appropriate hazardous materials storage and handling (Chan and Daniel, 2004).

2.2.5.16 Test and identify work areas for potential accident and health hazards

They test and identify work areas for potential accident and health hazards, such as toxic vapors and explosive gas-air mixtures and help implement appropriate control measures, such as adjustments to ventilation systems. Also are responsible for providing advice on the way out to eliminate or even reduce the health risk, attention

mostly is drawn on the prevention of hazardous materials and condition to protect the construction site management team (Chan,2009).

2.2.5.17 Measure and control hazardous substances

They measure and control hazardous substances, such as the noise or radiation levels, such a responsibility seek to come up with the degree of risk and ways to eliminate in the construction sites. In most case, failure to handle and control the substance materials created by the construction activities are recorded as the failure for safety officers to ensure thesafety of construction site management team. To avoid such a risk reputation the safety officers are required to inform and even educate the construction site management on the ways and means of handling the hazardous materials (Dejus, 2007).

2.2.5.18 Collect and handle samples of dust, gasses and vapors

They must properly collect and handle samples of dust, gasses, vapors and other potentially toxic materials to ensure personal safety and accurate test results. The safety officers are responsible for measuring the risk associated with the construction materials in various aspects. They can collect the samples to measure the risk of construction site management and the general environment under which the construction activity is organized. It means can closely work with other experts such as human doctors to collect advice based on the sample collected and its effects on living organisms (Eliufoo, 2005).

2.2.5.19 Investigate unsafe working conditions

If an injury or illness occurs, they investigate unsafe working conditions, study possible causes and recommend remedial action. The safety officers are responsible for preventing the unsafe working condition and providing advice to the construction site management team. They can undertake the thorough investigation on the existence of unsafe working condition and provide remedial advice to protect the construction site management team (Hallowell and Gambatese, 2010).

2.2.5.20 Communicate with management

Frequent communication with management may be necessary to report on the status of occupational health and safety programs. The safe officers are responsible for providing advice through communication with management of the construction companies on behalf of construction site management. The communication also seeks to check and investigate the status of occupational health and safety knowledge for construction site management team (OSHA Tanzania, 2013).

2.2.5.21 Prepare reports

They prepare reports including accident reports, OSHA record keeping forms, observations, analysis of contaminants and recommendations for control and correction of hazards. The reports that indicate the number of accidents that occurred at construction sites is well formulated with the authority of safe officers. Such a reports prepared on the basis of the nature of accidents, the risk and injuries of

construction site management team, even the destruction of construction materials and equipment are well recorded, this basically becomes potential ingredient for determining the causes of the accidents (OSHA Tanzania, 2013).

2.2.5.22 Prepare legal documents

They may prepare documents to be used in legal proceedings and give testimony in court proceedings. The safety offers are responsible for providing evidence related to accidents and any harm of construction site management team. This becomes possible of the nature of the activities and responsibility handled by safety officers, basically are the one with fresh data on the accidents and the nature of accidents as well as its possible causes (OSHA Tanzania, 2013).

2.3. Theories in construction activities

2.3.1. Construction Management Theory

The construction management (CM) is one of the most important theories in construction economics that aimed at controlling construction project in an efficient and effective way (Walters, 2009). It seeks to provide a wide knowledge based on the methods and techniques in the respective construction project development. Apart from the effective and economic way of the construction project, it emphasizes the way construction project are managed for efficient construction building.

The emphasis of CM theory ranged from methods for efficiency and techniques in construction work based on the health and safety issues on construction site management team. Although a number of construction projects are managed and

planned against the health and safety knowledge. This, theory focused on the improvement of the efficiency and quality of construction products based on the health and safety knowledge for the Contruction Site Management Team (CSMT), it is apparent that the performance of construction project is well measured on the health and safety for construction site management team.

2.3.2. Knowledge Management Theory

The Knowledge Management (KM) theory was developed by Meyer and Zack in (1996), the major themes of this theory were based on the strength derived primarily from its comprehensive information processing paradigm, which is almost completely adaptable to knowledge-based content. In particular, the notion of refinement is a crucial stage in the KM cycle and one that is often neglected. Furthermore, Bukowitz and Williams (2000) developed the concept of KM process framework; it basically relied on "how knowledge is generated, maintained and transferred strategically correct stock of knowledge to create value".

This theory recognized knowledge as that consists of knowledge repositories, relationships, information technologies, communications infrastructure, functional skill sets, process know-how, environmental responsiveness, organizational intelligence, and external sources.

This theory relates to this study as knowledge among the construction site management team are acquired and transferred in various ways, the external sources are mainly recognized as the ways and approach to impact the health and safety

knowledge among construction site management team. The knowledge development of construction site needs to support the construction industries and avoid injuries based on the infrastructures that are poorly handled by the construction site management team.

2.3.3. Knowledge acquiring and transferred methods

It is clear that the construction site management team uses traditional methods to acquire and transferred knowledge, such as discussion and informal meetings followed by documentation and registration, the construction site management team uses discussion to discuss and highlight important areas for the mistake, through that knowledge acquiring methods, knowledge is gained in other parts (Abdul, 2009). It is evident that documentation noted to provide experience and training to other workers in the organization. In the respective of health and safety agenda knowledge is acquired through the following methods;

2.3.3.1 Formal training

Formal training is the basic method of acquiring and transferring knowledge, through the training of employees regarding the occupational health and safety issues, short courses, this alert the construction site management team on the existing occupational health and safety issues of workers at the construction of sites. This is expected to orient the employees regarding the nature and method of acquiring and transferring occupational health and safety matters.

2.3.3.2 Innovative activities

The knowledge are acquired through various activities implemented in the organization, the health and safety issues may plan innovation activities that involve the construction site management team, it basically conducted at the sites such as controlling the equipment, the site managers also are responsible for designing activities such as management of the following materials.

2.3.3.3 Awareness of the firm's objectives

Awareness of the firm's objectives inform the construction site management team on the firm objectives on health and safety issues. It is important for the construction management site team to be aware of the firm objectives and know the exact firm plan on the protection and provision of health and safety knowledge based on the OSHA act 2003 requirement and procedures.

2.3.3.4 Informal discussions

Informal discussions among the site managers,engineers, and foremen, are important aspects in knowledge acquiring and transferred. It provides an understanding of the protective equipment and ability to handle occupational health and safety knowledge (Podgorski, 2010).

2.3.3.5 Recruitment of new members

The new members of the organization acquire knowledge based on the system of the organization to recruit new members. The present system in the organization

provides experience and knowledge on basic risk factors and the way to handle equipment, in the respective construction site.

2.3.3.6 Collaboration

The knowledge is acquired through participation and sharing of work experience and knowledge at the site. The construction site management team may collaborate internally and external experts. This generate more insight on the occupational health and safety agenda.

2.3.3.7 Action review

This is a processs of analysing what happens, why happened and how it can be done better by the participants of the construction site project or event. This action review includes the knowledge transferring methods,blogs communities, instant message, knowledge capture, elicitation, distillation, self-capture, leadership transition workshop, mentoring, peer assist, podcast, retrospect and storytelling (Hartmann, 2006).

2.3.3.8 The use meetings

The construction organization use meetings to transfer knowledge, it intends to bring together people of different skills, knowledge, and experience with various interests, while saving the time of the construction site management team. It avoids delay while encouring smooth of work at site (Abdul, 2009).

2.3.3.9 Interview

The interview is used to transfer knowledge through organized discussion to fulfill the objective of the organization. The need for sufficient knowledge transferring methods is required to promote construction site (Chan, 2009). It is organized by construction site management team to createfor organization use. The knowledge created needs to be transferred through the right information channels to handle occupational health and safety knowledge (Chen and Mohamed, 2008).

2.3.3.10 Communication

Communication channel emphasized the ability to handle knowledge from one point to another in the respective transfer channel. It increases learning experience on the site for use and even adaptation, The existence of new information in the construction site management team should be shared accordingly (Coulson, 2004).

2.3.3.10 The acquisition

The acquisition referred as the creation of knowledge for various uses in the organization. It is the method used in knowledge expansion in terms of applicability in various areas of human life (Sverlinger, 2000). It emphasizes the allocated experience of over time in the construction site management team.

Application, it is the method of knowledge transfer that aimed at using the existing accumulated knowledge through experience and human life, it generally focuses on

the practicability of knowledge accumulated, it even emphasizes on the primary basis of knowledge allocation to particular needs (Brown and Riley, 2000). The health and safety management of the construction site management team always seeks to handle the challenge associated with the ability of knowledge being applied.

2.3.3.11 Assimilation

Assimilation emphasizes the knowledge transfer through the practice of the members. This is a process that focus on the practice on a daily basis, this allowed transfer of knowledge through the mechanism of practice (Cody and Gilbert, 1996). The members to obtain knowledge controlled by the practice process. The members' focuses on learning through experience. It emphasizes the distribution of knowledge and sharing for construction site management team to allow efficiency of occupational health and safety knowledge.

2.3.3.12 Demonstration

The construction site management team acquires knowledge through demonstration conducted at sites. The demonstration seeks to show means of handling the equipment in safe procedure and prevention of problem-related to the way and methods for handling equipment.

2.3.3.13 Observation

Observation is another method of acquiring and transferring occupational health and safety knowledge of construction site management team. The construction site management team may mange to observe directly a particular task in occupation health and safety issues. The construction site management team during the activities manage to observe directly from co-workers of supervisors on the methods of handling dust and construction equipment.

2.3.4. Mechanism of knowledge transfer

There is an increasingly wide range of different views and perception regarding knowledge transfer and it's respective mechanical. This, however, slightly influenced by different views of writers from various backgrounds. Such argument has become hot in the current debate over the construction industries and its respective performance with regard to occupational health and safety issues from that experience to avoid confusion four themes come into being; (Argote and Ingram, 2000).

2.3.4.1.Knowledge reservoir concept

From these lines of understanding, knowledge transfer believed to occur through various actions traced to the organization from its benefits such as personnel movement, training, communication, observation, technology transfer, reverse engineering, products, replicating routines, patents, scientific publication, presentation, interaction with suppliers and customers, alliances and other forms of

inter-organizational relationship. In their model, an approach to knowledge transfer that looks into reservoirs of knowledge in organizations has been conceptualized (Argote and Ingram, 2000).

The knowledge reservoirs are an engine that originates from the combination of three elements that are basic and necessary to its formation includes members of that organization, tools in use for knowledge reservoirs and tasks to come up with sub-networks. The connection of various reservoirs in various circumstances of the network, such a network provides a room for social interaction among the construction site management team to effective handle the health and safety issues based on the knowledge and experience created in the industry. This promotes a sequence of task and routines that almost draw a combination based on existing technology. In a more unit of combination, it can even form a tool, network that signifies the combination of technologies in use. Other tools of combination slightly indicated on the member task networks that allow members to perform various tasks as assigned based on the responsibilities and duties as construction site management team.

In that aspect, a member can even decide what type of tools in use with what technology. It has been believed the performance of the organization under the construction activities need improvement of internal compatibility of the networks and their external compatibility with other networks. Typically various tasks allocated to the construction site management team who believed to perform well on the basis of occupational health and safety issues of the organization. It means the

organization may grant well and advanced tools to perform the task, almost the organization may allocate especially to the construction site management team with more qualification and believed to handle all the tools in well occupational and health safety issues. In such a situation knowledge may be well supplied based on the compatibility with the situation and the environment as well.

2.3.4.2.Organizational characteristics and management practices concept

Organizational characteristics are the first way and approach to thoroughly facilitating knowledge transfer and include: leadership style; problem seeking/ solving behavior; the presence of support structures such as technology, training, skill development, rewards and organizational design; absorptive and retentive capacity and types of knowledge (Goh, 2002). Under managerial practices he emphasized a high level of trust between individuals and work groups, an aspect also emphasized by Davenport and Prusak (1998) who similarly advocated for a strong and pervasive culture of co-operation developed through work practices that encourage and allow individuals and groups to work together. The individual spirit of cooperation promotes and enhances effectiveness and efficiency under the respective work environment.

2.3.4.3.Knowledge conversion concept

There is a slight different perception and understanding of the knowledge transferring ways such as that of tacit and explicit that in most instances occurring through “socialization process” where knowledge is created through a conversion

process of tacit to/from explicit, the conversion process almost aim at facilitating the transfer process of knowledge to meet the intended goal (Sverlinger, 2000).

In the use of socialization process, the purported knowledge in organizations is transferred, whether or not we manage the process; this provides more room for the construction site management team to work together in cooperation for the promotion of occupational health and safety agenda. Likewise, the organization almost trap the problem that's become increasingly affected the health and safety of the construction site management team. Likewise, construction site management team is willing and able to transfer knowledge for the respective performance of health and safety knowledge of construction site management team. It also, suggests the knowledge being confirmed to occur through a socialization process (Nonaka and Takeuchi, 1995).

2.3.4.4.Process concept of knowledge transfer and acquiring

The attention has been increasingly in the recognition of the process during knowledge transfer and acquiring, and its respective occurrence in the organization for the benefit of health and safety issues (Sverlinger, 2000). The transfer of knowledge from one point to another almost has to follow the process and the well identified the key process in the line of occurrence.

This has taken various forms such as knowledge acquisition, communication, application, acceptance and assimilation as the key processes in the transfer. Similarly,Sverlinger (2000) adopting and modifying Dixon's (1992) model of

organizational learning has more or less similar processes that he identifies as knowledge acquisition, distribution, making meaning, organizational memory, and retrieval. The knowledge management, the building block is also a process-oriented approach and has more or less identified with the processes mentioned in these other models.

2.4. Knowledge creation concept

The organizers have not concerned the process of information and knowledge processing units to solve the existing problems based on the changing environment but basically tend to create the knowledge based on the problem, the environment, and the solution. In fact, the creation of knowledge is not merely from the outside context, knowledge need to be built onits own, on the frequent basis based on the interaction between the construction site management team and members of the organization (Nonaka and Takeuchi, 1995).

It has been recognized that the organization cannot create knowledge on itself, but rather need to be created through individuals. It generally from the experience as that presented by Argyris(1999) that knowledge is created within the organization that moves spirally through the levels of the organization, that created by an individual are partly referred as the knowledge network that is owned by the organization.

This process, they consider, crosses intro and inter-organizational levels and boundaries. As for the epistemological view, knowledge is considered created

through a conversion process of tacit and explicit forms of knowledge through what they termed as *"*a socialization process*"*.

2.4.1. Knowledge creation on health and safety of Construction Site Management team

This study takes knowledge creation as occurring through a conversion process of two forms of knowledge, the tacit and explicit form; it is basically considered through "socialization process", which constitutes four modes; a socialization, an externalization, a combination and an internalization mode.

2.4.2. Mechanism of knowledge creation

The knowledge is created through comic socialization process where knowledge conversion occurs between the two forms of knowledge, tacit and explicit knowledge, it follows that understanding of the underlying mechanism of the conversion process is crucial. Nonaka and Takeuchi (1995) had given four modes of conversion of tacit and explicit forms of knowledge through a cycle and recursive process. The first mode is the socialization mode where it is posited, conversion is from tacit to tacit; the second mode an externalization mode where the conversion is from tacit to explicit; the third mode a combination mode where the conversion is from explicit to explicit and lastly an internalization mode where the conversion is from explicit to tacit.

2.4.3. Internal knowledge acquisition

Information was sought as to what extent firms acquire knowledge from internal sources as in congenital means such as organization founders, or prevailing

technology; critical reflection as in dialogue and questioning assumptions; experiential as through successes and mistakes; experimental as in innovation and research activities, and employees' awareness of the firm's objectives.

2.4.4. External knowledge acquisition

The means of external knowledge acquisition are as follow: number of conferences attended in the last five years; links with other consulting/contracting firms; relations with clients; recruitment of new members as a means of acquiring knowledge; collaboration arrangements; subscription to construction journals, and access to technical, economic and social reports.

A consulting firm in Tanzania distribute information through memos, reports, or verbal means; number of formal courses attended by employees since joining the firm and the existence of training programs, on-the-job training; job rotation; the practice of task forces in solving problems; internal publications such as brochures, journals, newsletters, internal seminars, workshops or courses, and informal networks(Matthew,2015).

The study was conducted byHughes and Ferrett (2011) who revealed that, the interpretation of information byconsulting firms were organized through the dialogue, process checks, critical reflection and rational analysis, past events, or through support tools. Also, the consulting firm manages interprets information through discussion to improveexperience on the occupational health and safety

knowledgea. This study specifically intends to capture and attain the performance of the construction industry.

The study done byEliufoo (2005) in Tanzania revealed that,construction site management used to store information and knowledge acquired on the health and safety knowledge through traditional storage system. This take into account on the firms' policies, routines, culture, structure, recalling the past, and tools. For external repositories, the findings shows that, the storage of competitors, customers and former members need to be organized by the construction site management team.

The study conducted by Kitumbo and Kirenga (2001) who revealed that, the consulting firm retrieval and control information of individuals or groups of individuals automatically especially embedded in the culture, the physical environment of the organization, the structure or in the individual's tacit knowledge.

2.4.5. Knowledge for safety officer

There are various classifications of the types of knowledge based on different literature, among others articulated or non-articulated, tacit and explicit, transferable knowledge and schematized or not-schematized knowledge. All these knowledge types, are famous in the body of literature and academic discourse, however, from the occupational health and safety knowledge specifically on the tacit and explicit that the safety officer is required to own such knowledge.

It is highly essential in the application and knowledge creation and concept based on the working knowledge, which essentially needs to plant in the management under the construction activities (Probst *et al.* 2000).

It is important to understand the knowledge transfer in various forms and ways to promote a successful construction activity. From this experience, understanding the tacit knowledge in the connection of health and safety knowledge in the construction sites (Goh, 2002).

It's evident that knowledge transfer and acquiring methods almost connected to clear and well-articulated types and form of knowledge, it is of panacea to dig deeper on the appropriate knowledge concept and forms in the effective promotion of health and safety knowledge. It is important to be in the position of well knowledge transfer mechanism based on the well-designed types and forms of knowledge in the respective health and safety knowledge, the tacit and explicit provide an attractive interaction and clear view in continuity and identity over the required knowledge (Eliufoo, 2005).

2.4.6. Knowledge areas for Site Manager

2.4.6.1 Commercial awareness

The site manager should be aware of the respective construction industry and ability to organize the business commercially, the high ability to organize the clients and the materials needed at the site commercially.

2.4.6.2 Problem-solving

The site manager needs to have knowledge on problem-solving especially relating to health and safety issues, the tendency of managing the problem and creating the solution is the responsibility of site managers, the difficult problems reported to higher next level for asolution (Lingard and Rowlinson, 2005).

2.4.6.3 Knowledge of construction processes

The site managers should be very skillful and knowledgeable on the construction process, this especially needed to control the health and safety problems, also it offers aprotective mechanism to other construction workers especially related to the highly risk construction process (Probst *et al.* 2000).

2.4.6.4 Organized construction Process

The site managers require to organize the construction process to attain the desired output in zero accidents and injuries. The accidents, and problems related to construction activity, in most cases need a special knowledge from site managers to control the safety and health of construction site management team (Eliufoo, 2005).

2.4.6.5 Knowledge of health and safety procedures

The site managers need to be knowledgeable on the respective health and safety issues. The important aspects of communication regarding to site problems, all

responsible tools for site health and safety materials. The site managers need to know and organize the whole procedures regarding to construction site health and safety issues (Hughes andFerrett, 2011).

2.4.7. Knowledge for Site Engineer

Risk Managementhas knowledge on the management of risk, especially on technical aspects based on the engineering responsibilities. Thus, the management relies on the technical machines that need to be well managed without any risk of the construction activities. Technical health and safety knowledge advisor, site engineer advice health and safety issues related to technical issues for subcontractors, craft people and operatives (Lee, *et al*, 2001).

Control Risk, the site engineer need to have enough knowledge on the control of risk especially related technical machines and equipment. Generally, at site machines and other construction tools may cause harm to thehealth of workers. The site engineers are required to have enough understanding of the risk control and offer the management mechanism (Lubega, *et al*, 2001).

2.4.8. Knowledge for Site Foremen

The site foremen are required to have knowledge on the various aspects

Handling equipment, basically site foremen are basically related to the site activity during the construction works. The basic knowledge that required should be related to handling equipment to safeguard the site and all human resources working there, it is mainly associated with the proper means to control and manage the work to ensure

safe working environment and even reduced the risks based on health and safety issues (Matthew, 2015).

Proper use of machines, the machines, and other construction materials need to be ensured are used properly, the site foremen are basically required with the knowledge on the use of machines and other harmful equipment for the basis of health and safety requirement.

Control risk of falling materials, the site foremen need to have full knowledge of the ability of control the falling materials and ensure safety for the site management team, basically, the falling materials are the most cause accidents in many construction projects. The site foremen basically required to be rooted on the specifying the risk and even offer appropriate mitigation procedure to reduce health harms (Murie, 2007).

2.4.9. Knowledge for Quantity Surveyor

The cost of project once estimated properly in the required knowledge tend to build understand on the ways to handle occupational health and safety issues. Quantity Surveyer control risk of the construction site management team.The risk based on the quantity required for the site need to be controlled by quantity surveyors (OSHA's , 2012).

2.5. Empirical Review

2.5.1 Occupational health and safety legal framework on Knowledge Transfer

OHS as a global issue is taking a new turn due to technological changes and rapid industrialization of the developing countries. This especiallyneeds a transformation of the legal framework to manage and transfer health and safety knowledge. This, in fact being contributed to the high rate of occupational injuries and illness in worldwide, most companies tend to marginalize or even to ignore OHS and give priority to other things than OHS. Generally, from dealing with the legal issues under the OHS (2003) the occupational health and safety knowledge is of priority towards the development of construction industry. As far as this study is concern only two parts of the occupational health and safety act (2003) basically were observed with serious concern such as; safety provision and Safety Special Provisions as follows;

Safety Provisionsof the OHS act, 2003 put strict emphasis on the provision of medical examination, training supervision, and inspection. The legal issues strictly emphasize training on the use of pressure vessels and lifting appliances need to be organized at thesite, especially at the minimal interval of time for ongoing construction projects. Also, the legal issues, stress that training on the use of equipment once failed to be provided the powers of thecourt should be taken to order the construction firm to provide training at workplaces.

Under the Safety Special Provisions, the construction site management team should have knowledge on risk assessment because to effectively manage the work environment and prevention on injuries and accidents related to risk environment and equipment. The Removal of dust or fumes, this help to control the health and avoid

the long-term contamination of chest problems, in addition to that construction site management need special provision with clothing, appliances, and eye protection to avoid any contamination with harmful materials produced at the construction sites.

2.5.2 Health and Safety legal requirement

Section 2(3) of Health and Safety at Work Act 1974 requires employers, with more than four employees to prepare and revise on a regular basis, a written health and safety policy together with the necessary organization and arrangements to carry it out and to bring the statement and any revision of it to the notice of their employees. This does not mean that organizations with four or fewer employees do not need to have a safety policy. It simply means that it does not have to be written down. The number of employees is the maximum number at any one time; they are full time, part time or seasonal.

2.5.3 Health and Safety knowledge required of Site Management Team.

The experience based on the intellectual and theoretical understanding of health and safety hazards being categorized as physical injury hazards and the Ill-health hazards (Murie, 2007). The hazard of physical injury is highly connected to death consequences contributed to construction activity. The hazard of ill-health can only be notified after a long period and shall cause sickness or death after a certain period of time, such as long-suffering in health issues that created by the construction sites. The following are common hazards on construction sites apart from physical injury or ill-health problems

The knowledge of construction site management team almost created and connected with working at height and its respective falling objects onto people due to proximity and with poor protective equipment. Such as handling of equipment, use of protective equipment and protective knowledge of falling of materials from a height and safe use of machines, this, was basically organized through past experience owned by construction site management team especially on workplaces (International Labour Organization [ILO] , 2005).

Expereince of New Zealand has revealedthat,falls from heights are the leading cause of occupational injuries on construction sites (Bentley *et al*., 2006). The protection knowledge at construction sites are not emphasized by both parties in construction activities.

In China's construction industry, falls account for approximately 51% of injuries and following it can be deduced that existence of weakness in the construction industry to protect the construction site management team from falling objects (Yung, 2009). Such as In Hong Kong, work-related falls from heights represented more than 47% of all fatal incidents that being occurred in the respective construction industry (Chang *et al*., 2008).

From the past experience that was generated by Chi and Wu (1997) indicate the existence of more than 30% of fatalities in Taiwan connected to falls of materials and people at construction sites. As a result, falls are the most costly occupational hazard in many countries. Common construction site falls include roof-related falls, crane

falls, scaffolding falls, elevator shaft falls, falls resulting from holes in flooring, and falling objects. These may occur as a result of inadequate edge protection, or from objects in storage being poorly secured. The management site team becomes vulnerable from such respect due to falling from a height include site foremen and site managers who undertake one-off jobs without proper occupational health and safety knowledge (Murie, 2007).

The knowledge of the construction activity and almost has a remarkable contribution of over a third of all major injuries at the construction sites (Hughes and Ferret, 2011). Such as over 10,000 construction site management team suffered serious injury because of a slip or trip last year. This almost can result in permanent suffering such as almost 95 % of major slips result in broken bones and permanent injuries on construction site management team (Health and Safety Executive, 2010). The slips and trips being considered to cause harm and destruction to construction management site team and even being more cost full employers over £512m a year in lost production and other costs and account for over half of all reported injuries to members of the public.

The experience brought by Lipscomb *et al* (2008) on the USA indicates that slips account for 18% of all injuries and 25% of construction site management team compensation payments. Slips contributed to 85% of falls on the same level and over 30% of falls from a height as well as a significant number of musculoskeletal injuries sustained after slipping (Ibid).

A slip being also considered as the cause of accidents, such as falls from heights. Slips and trips are caused when materials are scattered everywhere haphazardly, the floor is wet or greasy, inappropriate footwear is worn, mainly by casual employees and visitors, something large or heavy is being carried, reducing one's balance, and when the lighting is poor.

The knowledge of construction site management team basically become limited as a result of striking and crushed in the respective equipment and machinery at construction sites, especially by reversing machinery, site machinery falling in the excavation area, machines overturning due to travelling down a steep slope, and material falling from construction equipment especially haulage trucks, hitting behind it or nearby (HSE, 2004). This especially has incidents in the Crush injuries can have a wide range of serious effects, including fractures, internal injuries, head and brain injuries, and back injuries. In some cases, a crush injury may result in amputation and permanent disability of the affected construction site management team.

2.5.4 Ways Health and Safety knowledge are acquired and transferred to ConstructionSite Management Team.

Basing on the literature construction site management acquiring and transferring knowledge through demonstration, that put emphasize on-site instruction on the respective construction activity, the construction site management team manage to interact with knowledgeable expertise on occupational health and safety area.

Observation, this also require the construction site management team to direct see the ways equipment and electrical cables are handled, also manage to direct observe the control of harmful machines and materials at sites.

Communication, the ability of construction site management team to interact and communicate purposely to gain experience on the occupational health and safety knowledge, evidence also indicate that construction site management team manage to communicate through networks with co-workers from within and outside the construction firm.

Informal meetings is almost organized informally at sites, this basically captured the events on the occupational health and safety knowledge such as share ideas and solutions. Also, it provides relevant skills, knowledge, and experience to significant numbers of construction site management team.

Experience, on the site and ability to handle construction materials, equipment and produced dust, such an experience increases the ability and means to deal with in various manner and approach for the respective management (Coulson, 2004).

Formal training, need to be organized in the interval of time that increases the chance for the appropriate acquisition and transferring of knowledge on occupational and safety issues. The construction site management team is basically instructed on the various methods to handle, control and manage harmful equipment at the construction sites.

Short courses, this increases the chance of interaction for gaining knowledge in terms of experience and relevant insight on occupational health and safety knowledge. The short courses should be provided at sites for more practical instruction and even examination on the management, controlling and use of construction equipment.

2.5.5 Challenges faced by the construction site management team in acquiring and transferring health and safety knowledge

Currently, Tam *et al.* (2004) argued that safety and health issues in China were mainly affected by the poor safety awareness, lack of training, reluctance to commit resources to safety, risk nature of the construction sites, lack of qualification for construction site management team, weakness of institutions, incorrect procedures on health and safety provision, shortage of health and safety equipment, shortage of qualified expert in health and safety and reckless operations. This always connected to the weakness of construction site management to evaluate the knowledge and safety issues of management site team. Site management team with a good understanding of the protective tools and safety in all construction undertakings are well protected in the whole process of construction activity. But the construction activities are more risk based on its nature and complication. This calls for invariable transfer and acquiring of knowledge to construction site management team.

The knowledge transfer and acquiring tend to be connected with the type of construction activity and its nature. Some construction activities have high risks of construction diseases due to dust and falling materials. On the other hand, protection and its respective knowledge tend to differ with road construction and bridge. But the

knowledge required for health and safety is basically depending on the nature of construction activity and the context at is organized.

The study conducted by Dejus (2007) in the Lithuanian Republic found that; the major reasons for serious and fatal accidents are inexperienced employees, lack of qualifications and understanding of the problems that could occur at construction sites. Especially, low knowledge and experience in handling, safety gears and protection equipment provides more chance of accidents. This especially traced in the weakness of institutions and regulatory bodies to monitor and make close follow up at construction sites.

Generally, the institution's weakness brought about much attention in the destruction and accidents among the construction site management team probably are granted the legal permission to construction through corruption and less consideration for safety and health issues. Its implementation under the construction industries is worth little emphasis and consideration, the authority and those who are in power deny their responsibility in the expenses of corruption.

Rahim *et al.* (2008) conducted a study in Malaysia on the causes of accidents on construction sites; its results clearly indicated on unsafe methods, including incorrect procedures, knowledge level, and disobeying procedures are the most frequent reasons for accidents on construction sites. Following this, the construction site management team becomes vulnerable to the extent of knowledge and skills under the construction site activity. The extent of vulnerability almost is created under the

social context and legal framework in the construction industry. The closeness on the construction activity with government officials is highly limited due to budget constraints on the construction activity. Types of accidents in the construction activity are created from low knowledge concerning the protective gears and equipment, the knowledge of the uses and protection in the situation of falling materials proximity. It is apparent that the construction site management team is closeto the sites and almost executes the construction activity; they need care and advanced protection. The third world countries are associated with legal weaknesses and operations almost are not complete in procedures and regulation. Sometimes construction activity may operate without proper legal and authority inspection. The inspection is written and not practical on sites to monitor ongoing construction activity and check its harm of construction site management team.

Lubega *et al.* (2001), conducted a study in Uganda in the construction industry, the findings pointed out the major causes of construction accidents; firstly connected to the lack of knowledge concerning the safety rules, engaging an inexperienced workforce, and lack of respect for safety. The construction framework is basically indicated with legal weakness on the transfer of health and safety knowledge to construction site management team. The major barriers connected to construction site management team weakness to search and acquire knowledge on the health and safety issues.

The health and safety awareness on the construction activity brought more knowledge of construction site management team from construction diseases and any

other accidents. Apart from their protection demand much attention on the way the knowledge about the health and safety issues are transferred before the construction activity of construction site management team.

2.6 Conceptual Framework

Conceptual Framework is a theoretical structure of assumptions, principles, and rules that hold together the ideas comprising a broad concept. The conceptual framework discusses the following key variables which were used in this research. The discussion at a conceptual level where the key variables have been distinguished clearly, the different types of variables to be studied and specified nature of the relationship between them. The linking has several merits such as defining the boundaries of investigation to guide the researchers.

The independent variables are content/themes of acquiring health and safety knowledge, Content/themes of transferring health and safety knowledge, methods of acquiring health and safety knowledge and methods of transferring health and safety knowledge. From these factors the health and safety knowledge of construction site management team. The resulting effects are connected to the improved health and safety management. From theory framework of knowledge revealed that knowledge had to be created, acquired and transferred.

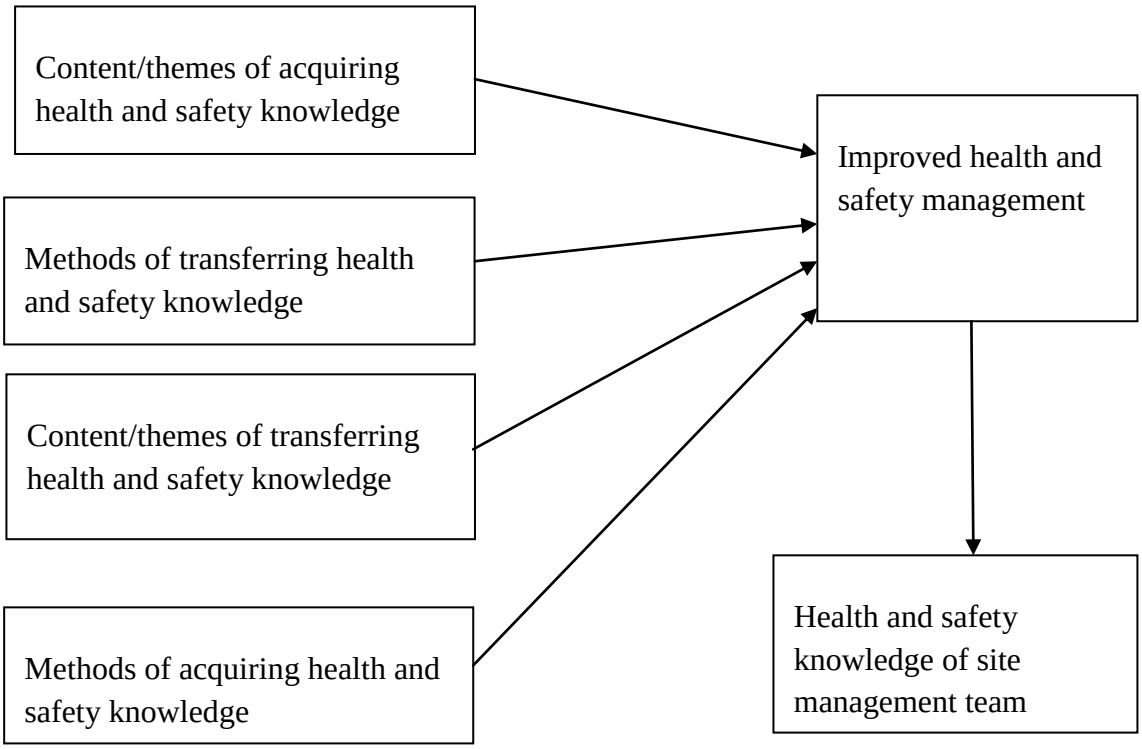

Figure 2.1: Research Model Summary

Source: Researcher's own conceptualization (2017)

Figure 2.1 indicate the health and safety knowledge of Construction Site Management Team depend on context/themes of knowledge acquired and transferred, content/themes of knowledge acquiring and transferring methods.

2.7 Concluding remarks on literature review

By considering different literature reviews discussed in this chapter in its context such as theories related to this study including construction management theory, Knowledge Management Theory, Knowledge acquiring and transferred methods and Mechanism of knowledge transfer. Also, the chapter has discussed on the empirical studies to thoroughly explain the major themes, the conceptual framework on this

study chapter was presented, specifically to address the occupational health and safety knowledge of construction site management team in Tanzania construction industry in selected construction sites in Mwanza city. Therefore, this provides roadmap in the methodology. Basically, the experience acquired from literature review provided the more insight on the tools for data collection identification and presentation in the next chapter three. The next chapter will highlight research methodology in variouis subsections.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the research methodology and procedures used by the researcher in a study area. It includes explanations about research design, type of data and information required, data collection procedures, sampling procedures, techniques, data management and analysis as well as data presentation procedures.

3.2 The Study Areas

This study was conducted in Mwanza region, particularly Mwanza City. The researcher selected this area for the study because Mwanza is a second largest city in Tanzania. According to the National Census 2012, Mwanza city has a population of 706,543.The existence of construction activities going on and the prominent places where the problem related to the occupational health and safety knowledge of construction site management team can be assessed.

3.3 Research paradigms

It is a systematic way of dealing with a research problem how to find a solution of the research problem methodology, methods, and techniques that help the research to come up with the solution for research problem. The basis behind the paradigms is how people view reality. The research paradigms followed a positivism, which stresses on the subjectivist approach of study social phenomenon attaches importance to a range of research technique focusing on qualitative analysis. For example, Participant observation, personal interview, etc. phenomenology social science approach which urges that the business situation is complex and unique, they are

functions of a particular set of circumstance and individual raising questions about the generalization of research that aim to capture the rich complexity of social situations, hence the social science approach used (Lufindi, 2008)

3.4 Research design

The study was used survey design for the assessment of an individual, group, or the phenomenon/happenings/event. It relatively covers a wider sample of the population; it specifically concentrated on the major aspects of the study. The survey was held generally on the information available on construction sites, geographical location of Mwanzabeing the Rock city of Tanzania signifies the best representation and accessibility of information related to the occupational health and safety knowledge of construction site management team in the Tanzania construction industry. However, this study did not limit the observation of another incidence that complimenting the study or even from referring to available secondary data to compare and even discuss the study findings.

3.5 Types of measurement

According to Kothari (2004) measurement is the process of assigning numbers to objectives or observations. The level of measurement being a function of the rules of which numbers are assigned, the most widely used classification of measurement scales is; nominal scale, ordinal scale, interval scale and ratio scale. The research usednominal scale to assign subject to certain categories.The ordinal scale used to exhibit the order, for example, ascending order. Numbers are assigned to variables so that they portray the order of magnitude but not size.

3.6 Data collection method and approach

Data collection begins after a research problem has been defined and research design checked out. The data collection technique depends on how best they can serve the purpose of the research. The Research used questionnares, documentary source and interview to collect data.

3.6.1. Questionnaire

In this method, a questionnaire was sent to the person concerned with a request to answer the questions and return the questionnaire. The research was based on self-designed to administer questionnaires to obtain information pertaining to the effective assessment of occupational health and safety knowledge of construction site management team in construction sites. The justification for choosing questionnaires in this study was based on conveniently, low cost, free from the bias because the answer has in respondent own words and respondents had adequate time to give well thought out answers. The questionnaires was consisted of scale items, open ended and close ended questions. The open-ended questions give respondents chance to provide detailed answer and freedom on giving views. On the other hand, the closed-ended questions were designed in such a way that it can be easy filled because of less time and efforts while still keeping the respondents on track. The questions in the questionnaires were focused on the Occupational Health and safety knowledge of construction site management team in construction sites.

3.6.2. Documentary source

Data was collected from written and printed materials that have been produced in a form of contractors' documents and construction project contract. The research used office construction records to seek more information on the Occupational Health and safety knowledge of construction site management team in construction sites.

3.6.3. Interview

The interview method of collecting data involves the presentation of oral verbal stimuli and reply in terms of oral verbal responses (Kothari, 2008). This method can be used through personal interviews and if possible, through telephone interviews and is particularly suitable for intensive investigation. The method was used to collect information about occupational health and safety knowledge of construction site management team from different staff with a different level of education as far as the study is concerned. In this study non-structured interview was applied because it allows much greater freedom to ask in case of need, supplementary questions or at time you may omit certain questions or you may even change the sequence of questions if the situation so requires (Kothari, 2004).

3.7 Nature of Data and data collection techniques

To obtain information about occupational health and safety knowledge of construction site management team for the study, research used both primary and secondary data.

3.7.1. Primary data

Primary data are those which are fresh and collected for the first time. These data are collected by using a questionnaire, personal interview, and observation from site project managers, site engineers, quantity surveyors, and site foremen. Primary data in this study were obtained because they give actual current information concerning occupational health and safety knowledge of construction site management team. They are raw material data in the sense that they have not yet been processed in any particular way.

3.7.2. Secondary data

Secondary data are those data which have already been collected and analyzed by someone else. This study used secondary data available in various publications of central and local governments, foreign governments, international bodies, organizations, journals, books, reports, public records and web sites. This is due to the reasons that the secondary data provide a historical reference of other past related studies.

3.8. Sampling procedure

The study has used both probability and non-probability sampling techniques: The probability sampling used to obtain 55 respondents randomly from the entire study population. Non-probability sampling allow the use of purposive sampling in selecting the site manager, site engineer and quantity surveyors. It is basically in the nature of the work positions and requirement of the study. Probability sampling

technique-simple random sampling was used to select Site Foremen from on going construction activity to be included in the study.

3.9. Target Population

The target population was 122 construction site management team selected from 15 on going construction sites. This study comprised of site engineers, quantity surveyors, and site foremen. With regard to the nature of the study, the inquiry focuses on every member of the organization whose tasks in one way or another is related to occupational health and safety knowledge of construction site management team. The Research was inquiring officers and staff from different contractors a total number of fifty-five respondents (55).

3.10. Sample Size

According to Yamane (1967) the sample size was selected from target group 122 construction site management team in construction sites, from15 ongoing building construction project in Mwanza City **(Matthew, 2015; AQRB, 2016).**

$$n = \frac{N}{1 + N(e^2)}$$

Where,

n = sample size

N = Number of sample frame

e = Level of precision (10%)

$$\mathbf{n=}\ \frac{122}{1 + 122(0.1)^2}$$

=55 respondents

The sample size was comprised of 6 project mangers, 12 site engeeners, 7 quantity surveryers and 30 site foreman. This is a reasonable number which can enable the researcher to obtain authentic data. No sample was perfected so need to decide how much error to allow. The division of the sample is as shown in table 1 below:-

Table 3:1 Sample of the study

Respondents	Sample size
Project managers	6
Site engineers	12
Quantity surveyors	7
Site Foremen	30
TOTAL	**55**

Source: data 2017

3.11. Reliability and Validity of the data

Reliability and validity are the two most important quality control objects in research.

3.11.1. Data Reliability

This is the ability of the instrument to measure consistently the phenomenon on it is designed to measure. Data reliability is a cornerstone of making a successful and

meaningful study. In order to collect reliable data, interviews and questionnaires were administered through an elaborate procedure which was involved a series of revisions under the guidance of the study supervisor to ensure that fieldwork was conducted by using high-quality data collection. Also, quotes from an interview and a statement from questionnaires were used as references to ensure reliability. Also, reliability was ensured by the use of appropriate sampling techniques including purposive sampling to select appropriate sample size of officials (Key Informants).

3.11.2. Data Validity

Validity refers to the degree to which study accurately reflect or assesses the specific concepts the researcher is attempting to measure (Fidel, 2007). To ensure validity, this study was applied the documentary analysis for secondary data. This was done through piloting of the data collection instruments. The data collection instruments were designed in such a way that, measure attitudes and opinions of respondents towards the occupational Health and safety knowledge of construction site management team in the Tanzania construction industry to the maximum degree possible. Issues developed from conceptual framework were compared with issues obtained during an interview and answers that were obtained from questionnaires so as to ensure construct validity, statistical analysis such as descriptive analysis was used.

3.12. Management and Data analysis

3.12.1. Data management

This involves systematically organizing the mass of raw data to be collected in a manner that was facilitating analysis of data. The research study included designing numbers directly for close ended questions in the questionnaires and for open-ended questions, and then categorized all responses given and assigns numbers to them.

3.12.2. Data analysis

Based on the objective of the study, the unit of analysis was drowned from the construction site management team; the study used open-ended and close-ended questionnaires in collecting its data. The study used Ms. Excel and SPSS version 16 as the main tool for analysis. First, all questionnaires were numbered for unique identification. This makes the process of identifying and tracing mistakes simple. This is followed by coding the questions through an SPSS sheet, ready to make inputs. The first part was concluded by entering choices of response in terms of numbers coded earlier. The second part involves the actual analysis. The study use tables and figures (bar chart and pie chart) to present descriptive results.

Also, the study collected documents from the internet and other information from interviews. The study used the information from these sources with themes similar to the study for comparison and discussion. It further used information from the interview to elaborate on unique features observed during the study.

3.13. Ethical Consideration

Cooper (2006) defines ethics as a norm or standard of behavior that guides moral choice, about a behavior and relationship with other variables. So research activities shall abide by the ethical issues like ensuring that no one is harmed or gives adverse consequences, from research activities like violating non-disclosure agreement, breaking respondent confidentiality, misinterpreting results, deceiving the people and invoicing irregularities.

The aim of the study was to communicate to each selected respondent who was informed that his/her response is voluntary and only those who was provided verbal and written consent was taken part in the study. The clear introduction and elaboration of the objectives were brought to every respondent before engaging him/her in the fieldwork. All research tool had an introduction to participants and was kept anonymous, to avoid any harm to respondents. Confidential including personal information was kept secret; keeping data in a very safe place, respondent's confidentiality of information retrieved was well assured.

Furthermore, the study was abiding by the ethics of social research ranging from professional ethics to those concerning researcher-respondent relationship. And all who was assisting the researcher in one way or another was given due respect. An acknowledgment of other scholars' works was maintained throughout the research process.

3.14. Concluding remarks

This chapter has discussed various components of research methodology such as; The studyarea, research paradigms, research design, types of measurement, data collection method and approach, nature of Data and data collection techniques, sampling procedure, target Population, reliability andvalidity of the data, management and Data analysis and ethical consideration that checked the procedures in data collection in relation to respondents confidentiality. The next chapter will expand a bit on the resesults, findings and discussion.

CHAPTER FOUR

PRESENTATION OF THE RESULTS, FINDINGS AND DISCUSSION

4.0.Introduction

In this chapter, data are presented, analyzed and findings discussed. The chapter focused on the occupational health and safety knowledge of construction site management team in construction activities. This study used four research specific objectives includes;

To determine health and safety knowledge required of Construction Site Management Team (CSMT), To examine the way health and safety knowledge is acquired and transferred to construction Site Management Team, To determine challenges faced in acquiring and transferring health and safety knowledge of construction site management Team and to propose effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge of construction site management team.The findings are in line with the research objectives and research questions that have been presented earlier in chapter one.

4.1 General information

In order to have a wide view of respondents, it is important to consider factors like sex, age education level, and occupation of respondents to ensure validity and reliability of the study findings.

4.1.1. Gender of respondents

Gender of the respondents not the main focus of this study but presented in order to see the influence of gender in occupational health and safety knowledge construction site management team the results are indicated in Figure 4.1.

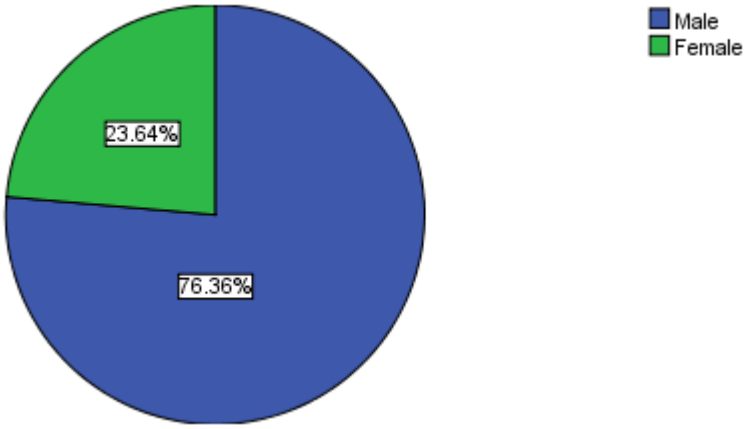

Figure 0.1: Gender of respondents

Source: Field data, 2017

From Figure 4.1 indicates that,42 (76.4%) are male and 13 (23.6%) are female respectively. This indicates that, male had more responsibiltires in construction work than female counterparts. The occupational health and safety knowledge of construction site management team in Tanzania construction industry in selected construction sites in Mwanza city mainly consider sex of the respondents, to avoid employment biases.

4.1.2. Age of respondents

Age of respondents are very crucial in occupational health and safety knowledge for constructionsite management team. It is important to observe age group of construction management site team for the occupational health and safety knowledge in the construction activities. As indicated in Figure 4.2.

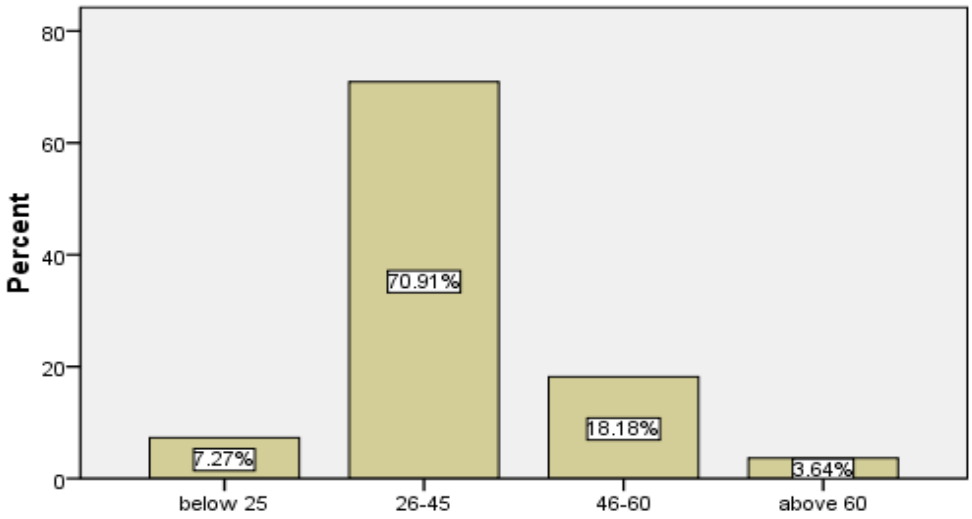

Figure 0.2: Age of respondents

Source: Field data, 2017

The finding on Figure 4.2 presents age group of the respondents. About 39 (70.9%) of the respondents were found in the age group of 26-45 years compared to 2 (3.6%) of the respondents fall in the age group of 60above years. This indicates that people of different age groups provided information on the occupational health and safety knowledge of construction site management team in Tanzania construction industry in selected construction sites in Mwanza city. Therefore, respondents from the age group of 26-45 years appeared majority due to the fact that construction work at sites appeared to be managed by the active age group for good performance. The occupational health and safety knowledge of construction site management team is needed in construction sites of Mwanza city.

4.1.3. Education level of respondents

Respondents in terms of education are very crucial to be involved in this study because education enables respondents to provide a clear and concise information than illiteracy one. Regarding the education level of the respondents, results are indicated in Figure 4.3.

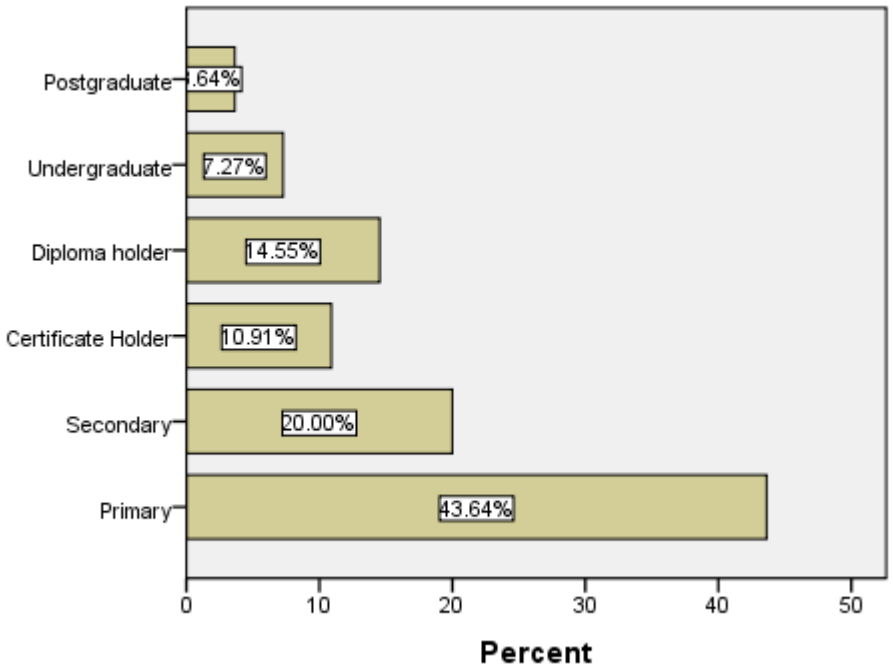

Figure 0.3: Education level of respondents

Source: Field data, 2017

The findings on Figure 4.3 indicates the respondent distribution by education level, a large proportional 24 (43.6%) of respondents completed primary school, followed by 11 (20%) of respondents who complted secondary school. These because primary education is basic and compulsory in Tanzania, also 6 (10.9%) had a certificate, 8

(14.5%) had a diploma, 4 (7.3%) were undergraduate and 2 (3.6%) where postgraduate education level. These findings indicate that some of the construction site management team has low education which could bring the challenge on health and safety knowledge. This was congruent with Giang, *et al.* (2010) who observed that low education and exposure provide a challenge in occupational health and safety knowledge which could cause damage, error, accident, harm or any other event which could be considered non-desirable.

4.1.4. Construction Site Management Team employment basis

It is important to know the participation of construction site management to associate with the health and safety knowledge acquisition at construction sites, as Table 4.1 indicated construction site management employment basis.

Table 0.1: Site management team employment basis

Category	Frequency	Percent
Part Time	9	16.4
Full Time	15	27.3
Temporary (Daily)	31	56.4
Total	55	100.0

Source: Field data, 2017

The findings on Table 4.1 shows that a large proportional 31 (56.4%) of respondents were Temporary (Daily) employed in construction work at the site, followed by 15 (27.3%) were full time employed and 9 (16.4%) were part time employed at construction sites. These findings imply that construction site management team are mainly employed on a temporary basis, this brings problem in the acquisition of health and safety knowledge on the construction sites. In fact, the short-

termemployment such as daily is an obstacle to occupational health and safety knowledge in the construction sites. Similar observation pointed out by Walters (2009) who argued full-time participation in construction work based in the employment contract provide more opportunity for acquiring and transferring health and safety knowledge .

4.1.5. Site position (Job description)

The job position regarded as an important aspect of acquisition and transferring of health and safety knowledge. As Table 4.2 indicated the site position or job description of construction site management team

Table 0.2: Site position (Job description

Category	Frequency	Percent
Site manager	13	23.6
Site engineer	12	21.8
Quantity surveyor	3	5.5
Site foreman	21	38.2
Safety officers/coordinators	6	10.9
Total	55	100.0

Source: Field data, 2017

The findings on Table 4.2 presents the site position of construction site management team, a large proportional 21 (38.2%) of the management site team are site foreman, followed by 12 (21.8%) site engineer and 13 (23.6%) project managers, 6 (10.9%) were safety officers/coordinators and 3 (5.5%) were Quantity surveyors respectively. These findings imply that, construction site management team had various job responsibilities, in that respect, occupational health and safety knowledge are required basing on the job description and responsibilities.

4.1.6. Experience on construction site works

The experience proved to facilitate more knowledge on occupational health and safety issues at construction sites, the findings on Table 4.3 presented the experience of construction site management team.

Table 0.3: Experience on- construction site works

Category	Frequency	Percent
Below 5 years	21	38.2
6-10 years	26	47.3
above 10 years	8	14.5
Total	**55**	**100.0**

Source: Field data, 2017

The findings attested experience on construction site works on Table 4.3, a large proportional 26(47.3%) of construction site management team had experience of 6-10 years in construction works, followed by 21 (38.2%) of construction site management team who had experience below 5 years and a small proportional 8 (14.5%) had experience of 10 years and above respectively. These findings imply that, enough experience on occupational health and safety issues.

4.2 Occupational Health and Safety knowledge required of construction site management team

Respondents were asked to indicate the extent of occupational health and safety knowledge. They have resulted are indicated in Figure 4.4

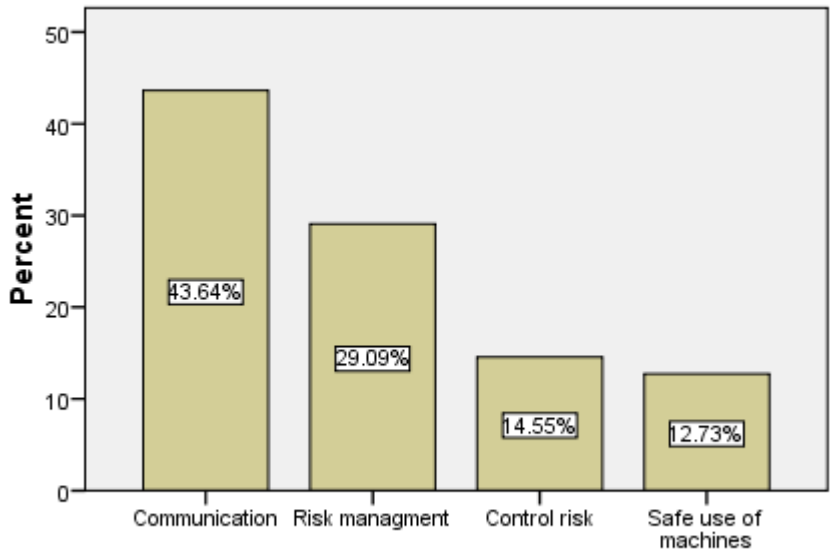

Figure 0.4: Health and safety knowledge requiredof construction site management team

Figure 4.4 presented the health and safety knowledge required of construction site management team, a large proportional (43.64%) of respondents reported to require the knowledge of communication, followed by (29.09%) who require the knowledge on the use of risk management, 14.55% require the knowledge on the knowledge on control risk and (12.73%) knowledge on safe use of machines respectively. These findings imply that construction site management team requires the knowledgeof communication that facilitates the communication of the health and safety issues to the workers and how they can handle equipment and facilities to reduce risk. The results indicate that majority have knowledge on occupation health and safety issues.

4.2.1 Methods whichconstruction site management team obtain health and safety knowledge

Respondents were asked to indicate how they acquire and transfer health and safety knowledge results are indicated in Table 4.4

Table 0.4: Construction Site management team places of obtaining information on health and safety

Category	Frequency	Percent
From study	5	9.1
From organization	8	14.5
Short training	11	20.0
My co-workers	31	56.4
Total	**55**	**100.0**

Source: Field data, 2017

The findings in Table 4.4 indicate the construction site management team places of obtaining information on health and safety. A large proportional 31 (56.4%) accessed information on occupational health and safety issues from co-workers, followed by 11 (20%) who obtained information on health and safety through short training, followed by 8 (14.5%) reported to gain information from organization and 5 (9.1%) reported to obtain information from study. These findings imply that construction site management team reported to heard information on health and safety from a co-worker. The findings imply that health and safety knowledge are acquired and transferred informally from co-workers, few workers are received from the study and short courses. Hearing from co-workers is reported to effective and mostly applied to acquire health and safety knowledge.

4.2.2 Company responsible for helping education on health and safety issues

The respondents (CSMT) were asked to provide their views on the responsibilities for providing education on health and safety issues, figure 4.4 summarized the responses from construction site management team.

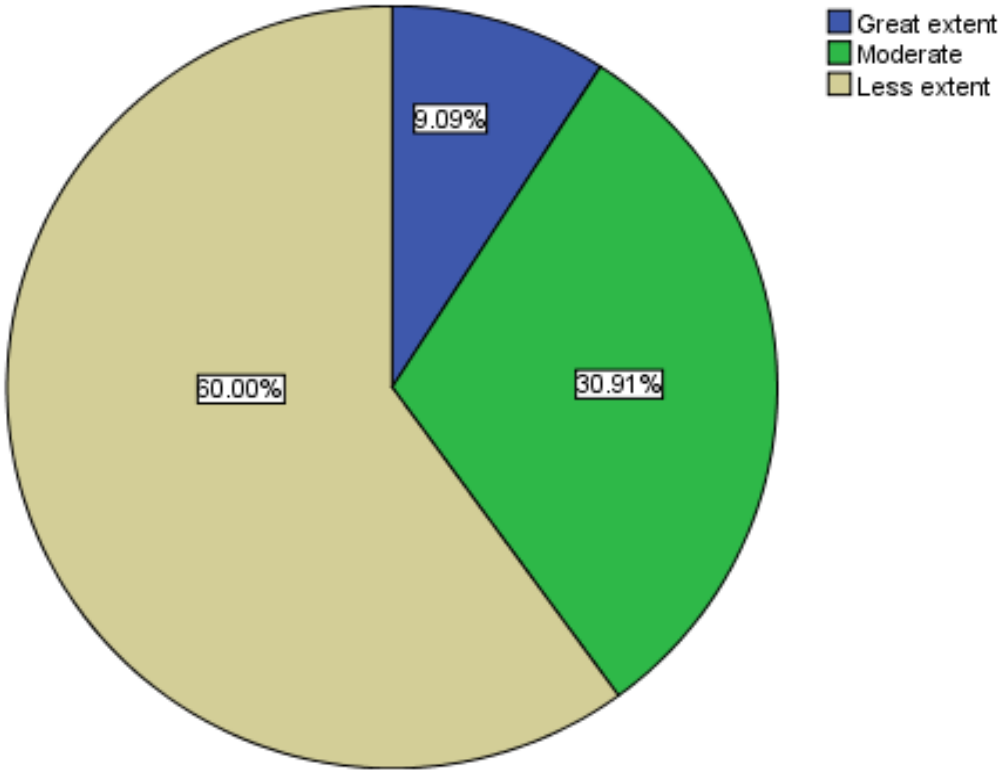

Figure 0.5:Company responsible for helping education on health and safety issues

Source: Field data, 2017

The findings on Figure 4.5 indicated the extent company had facilaited provision of education on occupational health and safety issues. More than half 33 (60%) reported that company is less extent for helping education on health and safety issues, followed by 17 (30.9%) who reported that company is moderate helping education

on health and safety issues and 5 (9.1%) reported that company is great extent helping education on health and safety issues. These findings imply that,construction site management team are less extent on providing occupational health and safety knowedlege for construction site management team.

4.3 The way health and safety knowledge is acquired and transferred to Construction site management team

4.3.1 Knowledge acquired and transfer methods

The health and safety knowledge are transferred to contraction site management team, through the use of various knowledge acquiring methods applied by the construction company as indicated in Table 4.5.

Table 0.5: Knowledge /Methods applied in acquiring and transferred health and safety knowledge

Variables	Scale						
	1	2	3	4	5	Mean	Ranking
Collaboration	6(10.9)	6(10.9)	5(9.1)	15(27.3)	23(41.8)	3.6364	2
Recruitment of new members	4(7.3)	6(10.9)	13(23.9)	27(49.1)	5(9.1)	3.1273	5
Informal Discussion	5(1.9)	1(1.8)	18(32.7)	0(0)	31(56.4)	4.2545	1
Awareness of the firm objective	10(18.2)	6(10.9)	5(9.1)	23(41.8)	11(20)	3.3182	4
Innovative activities	8(14.5)	11(20)	12(21.8)	14(25.5)	10(18.2)	2.8732	8
Demonstration	10(18.2)	9(16.4)	3(5.5)	15(27.3)	18(32.7)	3.4000	3
Observation	9(16.4)	6(10.9)	7(12.7)	17(30.9)	16(29.1)	3.4545	7
Meetings	2(3.6)	10(18.2)	5(9.1)	20(36.4)	18(32.7)	3.1000	6
Experience	6(10.9)	6(10.9)	1(1.8)	27(49.1)	15(27.3)	2.8612	9
Formal training	6(10.9)	5(9.1)	4(7.3)	30(54.9)	10(18.2)	2.8432	10
Short courses	10(18.2)	9(16.4)	3(5.5)	15(27.3)	18(32.7)	2.7212	11
Assimilation	18(32.7)	14(25.5)	6(10.9)	9(16.4)	8(14.5)	2.5368	12
Interview	9(16.4)	7(12.7)	9(16.4)	19(34.5)	11(20)	2.4133	13
Application	11(20)	8(14.5)	10(18.2)	10(18.2)	16(29.1)	2.3124	14
Communication	0(0)	7(12.7)	8(14.5	23(41.8)	17(30.9)	2.3911	15

Using Likert scale on Table 4.5, such as 1= Strong Disagree, 2= Disagree, 3= Indifference 4= agree and 5= strongly agree

A large proportional (56.4%)of construction site management team reported to have Construction Company that applies informal discussion to provide knowledge had mean of 4.2545 that ranked first, followed by (41.8%) of responddents who suggested on the collaboration appeared with 3.6364 mean that ranked second. Awareness of the firm objective had amean of 3.3182 that ranked four, Recruitment of new members had amean of 3.1273 that ranked five, followed bymeetings3.1000 ranked 6. From that observation Communication with amean of 2.3911 that ranked 15 was the least methods used in acquiring and transferred health and safety knowledge. These findings imply that construction companies acknowledge the use of various knowledge acquiring methods to ensure health and safety well known to its construction site management team. More emphasis is pressed to the informal discussion to handle the knowledge of construction site management team. Also, Eliufoo (2005) suggested that more particular knowledge in the construct industries of developing countries are acquired and transferred through theinformal mechanism. Also, Chen and Mohamed (2008) collaboration provides more opportunities for constructiuon site management team to acquire knowledge that is relevant to construction sites health and safety issues.

4.4 Challenges faced by site management team in acquiring and transfer health and safety knowledge

Respondents regarding challenges facing construction site management to knowledge transfer, the results indicated in Table 4.6.

Table 0.6: Challenges in acquiring and transferring health and safety knowledge for construction site management team

Variable	Scale						
	1	2	3	4	5	Mean	Raking
Lack of knowledge concerning Risk assessment and equipment	3 (5.4)	2 (3.6)	0 (0)	18 (32.7)	32 (58.2)	2.5636	1
Risk nature of construction site	2 (3.6%)	8 (14.5)	0 (0)	19 (34.5)	26 (47.3)	2.4232	2
In experience of employees	1 (1.8)	7(12.7)	0 (0)	19 (34.5)	28 (50.9)	2.4132	3
Lack of qualifications for CSMT	1(1.8)	8 (14.5)	2 (3.6)	12 (21.8)	32 (58)	2.0132	4
Safety resources	12(21.8)	8 (14.5)	1 (1.8)	12 (21.8)	22 (40)	2.0132	5
Weakness of institutions	3 (5.4)	7 (12.7)	0(0)	28 (50.9)	17 (30.9)	2.0031	6
Knowledge in handling equipment	13 (23.6)	6 (10.9)	0(0)	16 (29.1)	18(32.7)	2.0021	7
Incorrect procedures on H and S provision	3 (5.4)	6 (10.9)	5 (9)	23(41.8)	18 (32.7)	2.0011	8
Lack of training	22 (40)	3 (5.4)	2 (3.6)	16 (29)	12 (21.8)	2.0010	9
Shortage of health and safety equipment	2 (3.6)	3 (5.4)	2 (3.6)	16 (29)	32 (58)	2.0001	10

Source; Field Data (2017)

Using Likert scale on Table 4.6, such as 1= Strong Disagree, 2= Disagree, 3= Indifference 4= agree and 5= strongly agree. From Table 4.6, It revealed that (58.2%) suggested on the lack of knowledge concerning risk assessment and

equipment provide challenge in acquiring health and safety knowledge with mean of 2.56 that ranked 1, followed by (47.3%) risk nature of construction site with mean of 2.42 that rank 2, about (50.9%) of respondents suggested on the in experience of employees reported to have a mean of 2.4132, it ranked 3, About (58%) suggested on the lack of qualifications for construction site management team have mean of 2.0132. About (40%) of respondents suggested on the safety resources composed mean of 2.0132 were reported to be the challenge in acquiring and transferring occupational health and safety knowledge. These findings indicate that, construction site management team failed to transfer health and safety knowledge from respondent's due to lack of knowledge concerning occupational health and safety knowledge.

Charles (2011) observed that the construction site manager in most of the developing countries is limited knowledge conscerning occupational health and safety for appropriate management of construction industry.

Also, Tam *et al.* (2004) came up with several challenges that are almost associated with safety and health issues, including the poor safety awareness, lack of training, reluctance to commit resources to safety, risk nature of the construction sites, lack of qualification for construction site management team, weakness of institutions, incorrect procedures on health and safety provision, shortage of health and safety equipment, shortage of qualified expert in health and safety and reckless operations.

Similar observed reported by Podgorski, (2010) that construction management awareness and knowledge related ton health and safety issues are paramount on the management and control of construction activity. The protective tools and safety

knowledge are important in the construction activity that are more risk in nature and process, several attempts are required for the transfer and acquiring knowledge related to the construction activity.

Lee *et al.* (2001) observed that the construction industry face survival problems because of the challenges occur, especially when the nature of construction activities are complicated and require more knowledge. The health and safety knowledge arerequired to minimize the risks such as that of dust and falling materials. The protection and its respective knowledge tend to differ with road construction and bridge. But the knowledge required for health and safety is basically depending on the nature of construction activity and the context at is organized.

Concurrently, Cheng, *et al.* (2010) the state of technology and advanced means to acquire and transfer health and safety knowledge almost provide good practice of construction activities, for the case of knowledge development and technology advancement construction industry lack challenges. Sometimes the construction framework and regulatory body to manage the health of construction site management team, are affected by the technology status and level of human development.

OSHA Tanzania, (2013) reported on the existence of construction challenges, especially on the health and safety knowledge acquisition and transfer based on the complexity of construction projects, the construction site management team face difficult in protecting and reduce risk based on the nature of the construction project.

Sometime, the construction project is too complex to ensure health and safetyknowledge acquisition of site management team. Furthermore, Samson and Lema (2005) in line with though pointed out that construction activities are considered to be more hazardous due to existence of non-fatal and fatal injury's occurrence based on its unique nature.

Concurrently Misnan *et al*, (2008) observed the situation of no challenge under the construction industry is evident on the provision of effective training for transferring and acquiring occupational health and safety knowledge of construction site management team need more improvement. The challenges are prevented through the effective provision of construction knowledge, particularly on health and safety area to prevent any danger due to negligence and lack of knowledge. The construction firms and safety experts are required to ensure training and education influence in the development of health and safe knowledge. Improvement of health and safety issues through the respective knowledge provision expected to reduce the accident and health problem in construction sites.

4.4.1 Reasons for challenge existence in acquiring and transferred health and safety knowledge

With regard to the reasons of challenge in acquiring and transferred health and safety knowledge were presented inTable 4.7 were the specific reasons that create a challenge in acquiring and transferring health and safety knowledge.

Table 0.7: The reasons for challenge existence in acquiring health and safety knowledge

Category	Frequency	Percent
Nature of team	20	36.4
Nature of the knowledge	23	41.8
Work environment	12	21.8
Total	**55**	**100.0**

Source: Field data, 2017

Table 4.7 indicates the reasons for challenge existence in acquiring health and safety knowledge, a large proportional 23 (41.8%) suggested that the challenge is existing in acquiring health and safety knowledge due to the nature of the knowledge, followed by the nature of construction site management team 20 (36.4%) and work environment 12 (21.8%) respectively. These findings imply the magnitude of the knowledge need to be observed in the health and safety than the need for knowledge transferred of constructionsite management team. Abdul (2009) argued that knowledge magnitude needs a serious observation based on the nature and requirement for health and safety knowledge of construction site management.

4.4.2 The effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge of construction site management team.

The respondent's suggestion on the effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge of construction site management team shown in Table 4.8.

Table 0.8: The effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge

Category	Frequency	Percent
Provision of knowledge on risk assessment and equipment	19	34.5
Training on the use of equipment	7	12.7
Increases qualification of s construction site management team	11	20.0
Controlling working equipment	5	9.1
Provision of protective gears for risk reduction	13	23.6
Total	55	100.0

Source: Field data, 2017

The findings on Table 4.8 indicates the measure for health and safety knowledge improvement, a large proportional 19 (34.5%) suggested on provision of knowledge on protective gears and equipment to promote build health and safety knowledge of construction site management, followed by 13 (23.6%) who reported on the provision of protective gears for risk reduction and 11 (20%) suggested on the increase of qualification of construction site management team, a slight responses reported on controlling working equipment need to be provided as a separate knowledge ;for construction site management.

Further discussion revealed that, occupational health and safety knowledge improvement is required in construction site management team. Similar observation reported by Eliufoo (2005) who argued that, protective legal system in the construction industries required to support knowledge, transfer, creation and acquiring at the respective occupation health and safety of construction site management team. The legal systems are required for the prevention of risk and

ensure maximum protection of construction site management team, to safeguard the construction work through health and safety knowledge.

Also, the legal system facilitated the acquisition and transferring of health and safety knowledge, Phoya, (2012) lack of knowledge of the protected area for construction site management associated with worries on the health and safety of construction site management team. The respective provision and acquisition of health and safety proficiency improve the health and safety of construction site management team. The improvement of the system and means knowledge is transferred and acquired build the occupational health and safety knowledge of the construction industry.

Hallowell and Gambatese (2010) who argued that, prevention of unsafe working condition provide relevant advice and training to construction site management team. The training should increase knowledge and capacity building on the health and safety agenda. The risk in a construction project is minimized through appropriate knowledge acquisition for construction site management team. Thus procedure in knowledge acquisition regarding to health and safety matter expected to reduce injury or illness occurs, The safety officers are responsible to prevent the unsafe working condition and provide advice to the construction site management team. They can undertake the thorough investigation of the existence of an unsafe working condition and provide remedial advice to protect the construction site management team OSHA Tanzania (2013) contended that frequent communication with management required building knowledge on the occupational health and safety programs. The construction site management can even manage to ensure advices are

provided through communication with the management of the construction companies on behalf of construction site management. Importantly, communication creates, check and investigate the status of occupational health and safety knowledge for construction site management team.

4.5 Summary of findings

It first presented general information in terms of gender, age, education level, construction site management team employment basis, site position (Job description), and experience on- construction site works, the presentation of the general information focused on the occupational health and safety knowledge of construction site management team in construction sites.

The occupational health and safety knowledge of construction site management team are required to be provided. The findings on this objective showed that, construction site management team almost require the health and safety knowledge on the communication, risk management to protect thehealth of construction site management team. More particularly construction site management team received the information from co-workers, short training that is provided by the organization.

The findings on the way health and safety knowledge are acquired and transferred to construction site management team mainly were through the informal discussion, collaboration, demonstration, awareness of the firm objective, Recruitment of new members and observation that were presented to facilitate the acquiring and transferring of knowledge to construction site management team.

The findings on the challenges faced by the construction site management team in acquiring and transfer health and safety knowledge. The main challenges recognized as alack of knowledge concerning risk assessment and equipment, risk nature of construction site, in the experience of employees, lack of qualifications for construction site management team, safety resources, and weakness of institutions. In fact, all these challenges become into existence in the construction industry due to nature of the knowledge and team respectively.

The findings on the effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge to construction site management team, generally reported that provision of knowledge on risk assessment and equipment, provision of protective gears for risk reduction, increases qualification of construction site management team and provision of protective gears for risk reduction. The challenges in acquiring and transferring knowledge generally recognized through the management of risk and equipment used in construction site by the construction site management team. The next chapter will present conclusion.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1Introduction

This Chapter is divided into two main parties. The first present about the conclusion made under this research study and the second part present about the recommendation. The conclusion and recommendation made are based on the findings obtained in this research study. The areas of the further research study are also given under this chapter.

5.2 Conclusion

This study aimed to assess the occupational health and safety knowledge of constructionsite management team in Tanzania in selected construction sites in Mwanza City.

This study revealed thathealth and safety knowledge required by construction site management team wereon the communication, risk management, control risk and the safe use of machines. In fact, the ability to communicate in construction sites, control, and manage risk help to protect the health of construction site management team.

In most cases the construction site management team reported to receive information from co-workers others reported obtaining health and safety information from short training that is provided by the organization. Meanwhile, the companies in the construction industry are less extent on providing education on health and safety

issues of construction site management team. In fact, it has been noted that the construction site management team always informed on the use of equipment provided at construction sites.

The construction site management team acquire and transfer knowledge through informal discussion, collaboration and demonstration at construction site.

The findings noted that, the construction site management team in most instances lack knowledge on risk assessment and equipment and Risk nature of construction site. In fact, create the challenge in acquiring and transferring health and safety knowledge of construction site management team.

Furthermore, the effective knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge were mainly suggested on the provision of knowledge on risk assessment and equipment and provision of protective gears for risk reduction. The measures are required to increase the knowledge in acquiring and transferring health and safety knowledge of construction site management team.

5.3 Recommendations

5.3.1 Recommendation to policy

The study, therefore, recommends the inclusion of occupation health and safety knowledge of construction site management team to emphasize and supervise on the effective control and management of risk. The policy should clearly state and supervise the risk control and management for the protection of health and safety of construction site management team.

5.3.2 Recommendation to regulatory system

The findings of this study showed that informal discussion mainly used to transfer and acquire health and safety knowledge for construction site management team. It should be emphasized in various ways to affect the regulatory system to allow meetings and informal discussion at sites purposely to transfer and acquire health and safety knowledge.

5.3.3 Recommendation to construction industry

Furthermore, the study revealed that the responsibility for construction site health and safety knowledgeon the site management team, based on their responsibility and better communication with construction industries to control and manage risk in construction activity.

5.4 Area for further Studies

To researchers, further research should be undertaken by anyone who is interested in finding more on Occupational Health and Safety Knowledge among Construction Site Management Team.

The researcher should thoroughly pass through the study and concentrate on new variables. Such as; the impact of action review on health and safety knowledge transfer among the construction site management team and the ability of construction companies to handle health and safety requirement for construction site management team.

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APPENDIX I**: QUESTIONNAIRES FOR SITE MANAGEMENT TEAM**

Dear respondent**;**

The purpose of this questionnaire is to ask for your honest responses related to An Assessment of Occupational Health and Safety Knowledge for construction site management team inTanzania. The finding will help to implement policy, by law and method institution governing construction works can adopt them where its impact to the construction activity can increase profitability and reputation. The information offered will not be disclosed to anybody else since the report is for academic purpose only.

SECTION 1: General information of the respondents

Please put a tick (√) **on the appropriate space**

1. Sex of respondent
    a) Male ( )
    b) Female ( )
2. Age of respondent
    a) Below 25 ( )
    b) 26 – 45 ( )
    c) 46 – 60 ( )
    d) Above 60 ( )
3. Level of Education:
    1. Primary School leaver, ( )

2. (b) Secondary School leaver, ( )
3. (c) Certificate Holder ( )
4. (d) Diploma Holder, ( )
5. (e) Undergraduate, ( )
6. (f) Postgraduate ( )

4. Are you employed on the basis of
    a) Part Time ( )
    b) Full Time ( )
    c) Temporary (daily) ( )
5. Type of employer
    a) Main Contractor ( )
    b) Sub-Contractor ( )
    c) Other (specify)……
6. Job title (trade/description)
    a) Masonry (block layers) ( )
    b) concrete ( )
    c) Others (specify)…….
7. Experience on construction site works
    a) between 1 – 5 years ( )
    b) 6 – 10 years ( )
    c) above 10 years ( )

SECTION B: The ways health and safety knowledge is acquired and transferred to construction site management team

8. Do you receive health and safety knowledge through induction?

a) Agree ( )
b) strongly agree ( )
c) Indifferent ( )
d) Disagree ( )
e) strongly disagree ( )

9. Are you receiving training on health and safety issues at sites?

a) Agree ( )
b) strongly agree ( )
c) Indifferent ( )
d) Disagree ( )
e) strongly disagree ( )

10. Are the construction organization has a Health and safety module?

a) Yes ( )
b) No ( )

12. Which methods do you apply in acquiringand transferring health and safety knowledge

a. Communication ( )
b. Application ( )

c. Assimilation ( )

d. Collaboration ( )

e. Informal Discussion ( )

f. Demonstration ( )

g. Observation ( )

h. Meetings ( )

i. Short courses ( )

j. Formal training ( )

k. Experience ( )

l. Others (Specify……..)

SECTION C: Health and safety knowledge required for construction site management team

13. Do you have any information about health and safety in the workplaces?

a) Yes ( )

b) No ( )

14. If yes where did you get information?

a) From study ( )

b) from organization ( )

c) Short training ( )

d) my co- workers ( )

e) my supervisor ( )

15. Do you obtain Proficiency impartation at construction sites?

a) Agree ( )

b) strongly agree ( )

c) Indifferent ( )

d) Disagree ( )

e) strongly disagree ( )

16. Invariably receive Training on the use of equipment at the construction sites?

a) Agree ( )

b) strongly agree ( )

c) Indifferent ( )

d) Disagree ( )

e) strongly disagree ( )

17. Site management team receive knowledge on controlling working equipment

a) Agree ( )

b) strongly agree ( )

c) Indifferent ( )

d) Disagree ( )

e) strongly disagree ( )

18. Does the site management team receive the safety knowledge?

a) Agree ( )

b) strongly agree ( )

c) Indifferent ( )

d) Disagree ( )

e) strongly disagree ( )

19. What are the health and safety knowledge required to construction site management team?

a. Handle equipment ( )

b. The use of protective equipment ( )

c. Protective knowledge on falling materials ( )

d. Safe use of machines ( )

e. Others Specify……..

SECTION D: The challenges in acquiring and transferring health and safety knowledge to construction site management team

20. Which challenges encounters in acquiring and transferring health and safety knowledge to construction site management team?

a) Lack of training( )

b) Protective gear and equipment( )

c) In experience of employees( )

d) Safety resources( )

e) Lack of qualifications for Construction Site Team ( )

f) Knowledge in handling equipment( )

g) Others Specify……..

22. Does work environment provide challenges to acquire and transfer health and safety knowledge to construction site management team?

a) Agree ( )

b) strongly agree ( )

c) Indifferent ( )

d) Disagree ( )

e) strongly disagree ( )

23. Comments on the measures to solve the challenges to acquiring and transfer health and safety knowledge to construction site management team?

……

……

24. What is the knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge to construction site management team?

……

……

APPENDIX II: Interview guide for key informants

Dear respondent**;**

The purpose of this questionnaire is to ask for your honest responses related to An Assessment of Occupational Health and Safety Knowledge for construction site management team in Tanzania. The finding will help to implement policy, by law and method institution governing construction works can adopt them where its impact to the construction activity can increase profitability and reputation. The information offered will not be disclosed to anybody else since the report is for academic purpose only.

1. How are the ways health and safety knowledge acquired and transferred to construction site management team
2. What are the required health and safety knowledge to construction site management team?
3. What are the challenges faced in acquiring health and safety knowledge to construction site management team?
4. How can health and safety knowledge be improved to construction site management team?
5. What is the knowledge transfer mechanism to mitigate the challenges in acquiring health and safety knowledge to construction site management team?