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SAFETY MANAGEMENT IN CONSTRUCTION PROJECT MANAGEMENT

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ABSTRACT: *Construction is one among the foremost dangerous sector. Countless industry accidents occur within the world causing damages and injuries to workers and consequently economical losses each year.*

Safety issues has gained importance throughout industry. Many construction companies around world are implementing safety to scale back injuries, eliminate illness, and to produce a secure work environment in their construction sites.

The aim of this research is to spot and evaluate the security management in construction projects to regulate and minimize Health and Safety (H&S) of construction workers. Questionnare use to gather a good range of opinions from experienced professionals working in numerous construction sites to match. The reviews of this literature are the primary step in obtaining information from previous related studies.

The literature review provides the theoretical background about safety management that has guided design of questionnare. This research concludes that industry has high number of fatalities and long-term injuries. It is unacceptable in modern society and also makes the industry inefficient, with days lost because of injuries. Research shows that the foremost of accidents are thanks to several common factors, like poor construction planning, lack of design safety, inadequate safety training, workers behaviour, inherent safety H&S risk of construction and lack of data of site rules and regulations.

1. INTRODUCTION

Construction industry is considered as one of the most dangerous industry in the world. Day to day there is an increase in the number of building which are built for residential, commercial and office purposes in every year. The construction sector day to day continues to expand due to the increase in the need of infrastructure facilities, home, office spaces etc,. The construction industry is very huge and complex and most likely to suffer numerous health hazards. Therefore safety plays a vital role in the construction industry as a result of a hazardous free environment.

Safety management is an essential knowledge in the part of a project management which is recognized in The Guide to the Project Management Body of Knowledge. Safety management is expected to analyses the all risks and accidents that may be possibly happen that can keep project employees out of risk. Therefore it is very important to identify such suitable strategies and safety activities

Past research shows clearly that construction projects create frequent possible threats to the lives of employees, and serious injuries major accidents and deaths are frequent in the construction industry. Thus, by the considerations and management of safety, along with consideration to H&S generally, it is obviously fundamental to any construction project. By the proper H&S planning many of the risks in construction sites or in construction projects can be prevented.

Safety professionals has analyzed where the major accidents takes place and are initiated related to unsafe behaviors and it is one of the key to be successful in accident prevention that resulting in low accidents in construction sites. The number of deaths causing in construction site is not easy to express information on this issue because it is not available in many countries. The main concern in construction industry is on completing projects at the required quality within minimum time and cost without any delays. Carelessness has been considered as one of the major reason due to which many incidents and risks takes place in construction sites. With the changes in schedules and timings along with the change of employees themselves combined with the nature of the construction jobs makes the construction sector with accident risks. Hence the major aim is to reduce the accidents takes place in construction sites by considering safety aspects.

Safety management is the procedure used to recognize H&S risks and implement actions to reduce the possibility of a risk and to eliminate the consequences of identified project H&S risks. This research is focused on the type of risks in construction projects like risk of construction on health and safety (H&S) of employees.

Injuries and fatalities resulted in accidents in the construction industry still an obstacle clings construction industry to its infamous position as the industrial sector responsible for more occupation accidents, than any other. Consequently, the improvement of H&S in construction is still an essential goal for all contributors in the construction processes. Safety management is likely to take account of all risks and accidents that may believably be expected that put project employees at risk, to minimize

such risks. It is thus important to identify appropriate safety actions and strategies to accommodate potential serious H&S problems.

Safety management is a method which is used to control safety activities in order to ensure a safe working environment in the construction site. Safety during the construction project is also influenced to a great part by decisions made during planning and design process. Construction safety can be branched into four groups which are panning for safety, employee training for safety, first aid and medical measures and safety policies by the management.

Therefore, the aim of the research is to identify and evaluate the safety management in construction projects to diminish and control risk to H&S of employees/workers. This aim could be achieved by:

- Analysing the H&S problems related to the construction industry and explore solutions to avoid risk on life of construction crews.
- Understanding side effects of construction processes on the H&S of employees to reduce the site accidents and injuries.

1.1 SAFETY MANAGEMENT

Safety management is an organisational function, which certify that all safety risks have been identified, evaluate and satisfactorily reduced. Safety management is necessary for the required changes in system of work and perspective.

- It come about to a recognize of safety in work activites.
- It help in gaining a basic knowledge of risks and precautions.
- To convience employee to make useful allowances.
- To enlarge clean habits
- To increase efficiency in the use of tools, equipments and process.
- To consider and execute useful and effective suggestions

BASIC PRINCIPLES OF GOOD SAFETY MANAGEMENT

• Management commitment

• Safety objectives and objectives

• Committee association for security

• Safety communications

• Supportive security staff

• Safety trainings

• Accident examinations

• Line duty regarding security

• Rules and procedures

• Audits

• Motivation

1.1.1 NEED OF SAFETY MANAGEMENT

The construction business has some special highlights which have a direct bearing on the accident potential. In this exchange the example of work is truly changing. The activities and physical circumstances change constantly not at all like in the factories where the process, method and tasks are commonly respective. Timings and schedules fluctuate considerably from place to place. The main changing factor the change of men themselves. The inherent idea of construction work combined with the above factors make this industry as one with accident hazards.

The advantages of a wellbeing the executives system in the construction business are:

• Reducing the quantity of wounds to faculty and agents in the workplace through the anticipation and control of workplace hazards,

• Minimizing the danger of significant accidents,

• Controlling workplace chances improve representative confidence and enhance productivity,

• Minimizing production interruptions and reducing material and equipment harm,

• Reducing the cost of insurance just as the cost of worker absences,

1.1.2 ROLE OF VARIOUS PARTIES IN SAFETY MANAGEMENT

• Designer

• Employer

• Worker

Originator

• At the arranging stage, the architect, specialists and creator and planners should give due considerations to wellbeing of the laborers

• Take into account the wellbeing issues associated

• Avoid anything in plan which would require the utilization of hazardous structural procedures and hazards.

Business

• Should give and keep up plant and equipment well and sort out the work

• Ensure legitimate supervision to laborers

• Workers should be given legitimate instructions about wellbeing requirememts.

Laborers

• All laborers do everything witin power to give security to themselves and to co-specialists.

• Before starting the day's worth of effort they should inspect the place of woek and equipment they have to utilize and any defect by them should be accounted for to the supervisors or another competent authority

• Should utilize all protections and security devices.

1.1.3 HEALTH and SAFETY TRAINING

Addresses the wellbeing health obligations of all staff, whether salaried or hourly. Ensure that all laborers understand well with respect to the dangers to which they may presented and how to keep harm to themselves and others from introduction to these dangers.

Ensure that supervisior carry out their security and health obligations, including

• Analyzing the work under their watch to distinguish unrecognized expected hazards.

• Maintaining physical protections in work zones.

• Reinforced representative preparing through continual performance feedback and, if necessary, enforcement of safe work practices.

• Ensure that troughs understand their security and health duties, as described under the administration commitment and representative association element of the rules.

• Ensuring work grants.

• Internal/outside safe audicts in ordinary frequencies

• Checklists throughout the construction phase.

Advantages of construction Safety Training

Toward the finish of the course, participants will have the option to

• Recognize the common wellbeing hazards at construction site,

• Know the preventive measures to be embraced

• Confident in working at height

• Understand the importance of noticing wellbeing signs and safe work procedures

• Understand importance of PPE and its impediments

• Know their rights and duties

1.2 ACCIDENTS

Accidents are characterized as "an undesired incident that happens harm to property or physical harm to individuals". Accidents may happen while construction and destruction activities, bringing about injury, generally endured by laborers on the work site. Accidents might takes place generally during site examination and study of a project, project things execution. Figure(1) shows the percentage of the causes of lethal wounds in the construction business. Practically half of all casualty takes place because of tumbles from height, according to this pie chart, almost a third mortality struck by a moving vehicles and objects. Other mortality were subjected to electricity accidents, collapse accidents, and other.

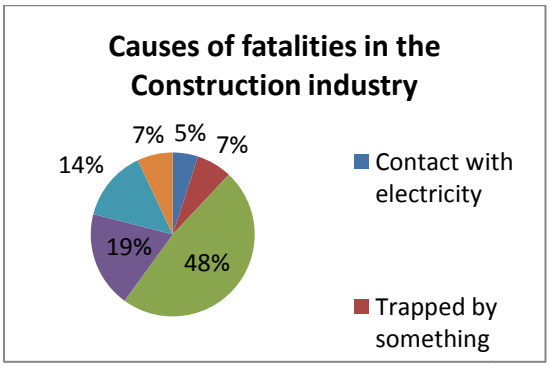

Fig. (1): Causes of fatalities in the construction industry

1.2.1 CAUSES OF CONSTRUCTION ACCIDENTS

Hazardous work site conditions were key purpose of coming about 10% of accidents on the construction site shows up as Schaufelberger and Lin (2014) expressed, and 90% were because of risky behavior. Moreover, the HSE declared that about 80% of accidents in the UK are because of human behavior (cited by Li and Poon, 2013). Furthermore, Peyton and Rubio (1991) acknowledged that work accidents in locales occur through two principle mechanisms: risky conditions and hazardous acts. What's more, risky behavior may show up because of a representatives perspective, stress, sluggishness, or physical condition. Additionally, numerous factors such as insufficient and helpless communication, sub-contracting to careless firms, lack of H&S preparing and low educational level of construction staff individuals prompts accidents as attested by Cheng et al. (2004). Schaufelberger and Lin (2014) conceded not many instances of accident causes, such as: A worker notices a hazardous condition however he/she doesn't do anything to correct it. For example utilization of defective equipment such as a stepping stool.

An individual playing out the work in faulty manner or dangerous way because of lack appropriate preparing. A specialist may disregard the security conditions then an incident may takes place.

Lehto and Salvendy (1991) communicates three primary models of accidents causation to be specific: "(1) generic accident process models; (2) blunder of human and hazardous behavior models; and (3) human sores mechanism models".

Common causes of construction site accidents include:

• Lack off all protection for laborers on raised structures

• Lack of protection for individuals on the ground from falling objects

• Tripping hazards from construction materials and flotsam and jetsam

• Missing gatekeepers or protections on power devices

• Unsafe equipment

• Lack of security precautions when working close to power lines

• Lack of protection for laborers in trenches

Here are a portion of the common causes of these wounds:

1. Slip and falls, frequently caused by hazardous working conditions.

2. Falling on flights of stairs, when steps are introduced incorrectly or there are not handrails.

3. Stepladders, which can spill or even collapse.

4. Tumbles from rooftops, when no fall protection or helps are given.

5. Inability to follow state wellbeing guidelines for scaffolding, which can collapse.

6. Trenches and excavation dividers collapsing when not introduced correctly.

7. Power device accidents, esp. when eye and ear protection are not worn.

8. Lifting inappropriately, with back muscles rather than legs.

9. Dump trucks, forklifts, and other vehicles.

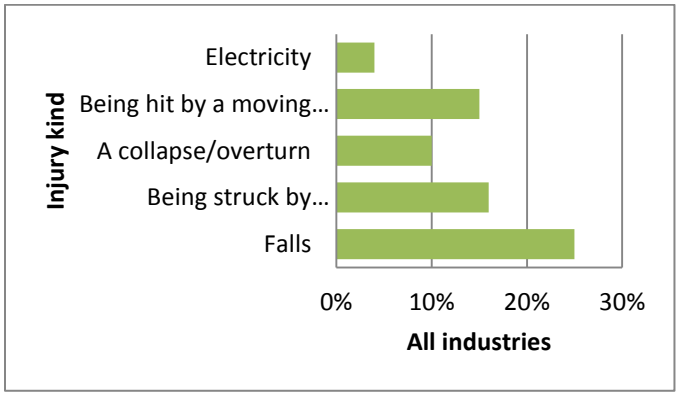

Fig (2): The main causes of worker's fatalities in construction industry

According to Griffith and Howarth, 2001, the main causes of fatal accidents during the erection and dismantling of scaffolding are due to platforms lacking edge protection. Therefore, more investigations of scaffolding are demanding to minimize and control the height number of accidents were due to unsafe scaffolding RubioRomero et al. (2013).

Accordingly, the detections of this study, some advices could be made that are needed for safer scaffolding OHSAS (2016): Hire an outside scaffold erector AS/NZS (2001).

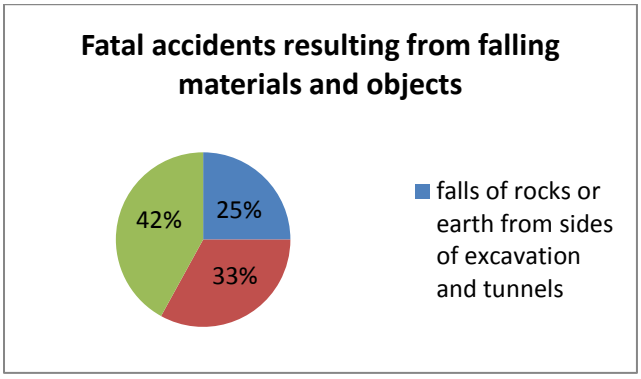

Fig. (3): Fatal accidents resulting from falling materials and objects

1.3 PROTECTIVE CLOTHING AND SAFETY EQUIPMENT

To decrease the hazards nearby accidents, protective clothing wearing and the utilization of individual protective equipment is generally significant. The laborers should give wellbeing equipment and protective clothing for all specialists like, laborers have an obligation to protect their own Health and security (Davies and Tomasin, 1990). Furthermore, laborers on the construction site should be supervised by a certified H&S supervisor to ensure that the laborers should and should adhere to the wellbeing instruction to wear protective clothing to keep specialist's more secure from hazards in site (Zin and Ismail :2012).

Hearing Protection

Use earplugs/ear protectors in high commotion work territories where chainsaws or heavy equipment are utilized; clean or replace earplugs routinely.

The solitary individual protection equipment all around gave to laborers on construction locales by managers are eye goggles, gloves and hard hats (helmet). Still numerous laborers are disappointed with such arrangements, and they accept that these things of protective clothing are insufficient to protect them from hazards nearby (Figure 4).

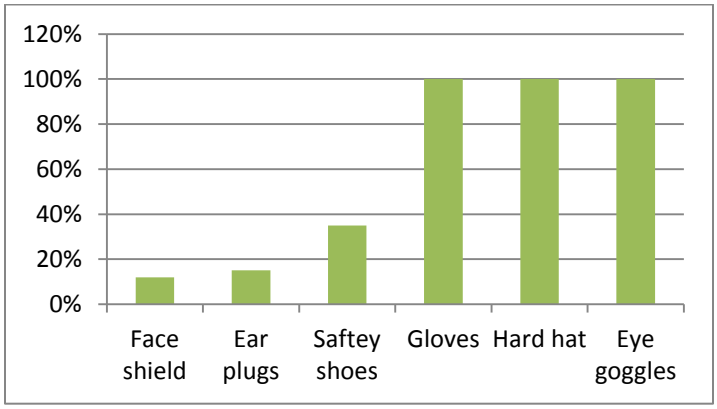

Fig. (4): Personal protective equipment provided to employees on site

2. RESULTS ANALYSIS

The results of the questionnaire and the main points rises from analysis of the results would be represented in this section.

2.1 Background of respondents

It is clear that the quality of the data collected by a questionnaire survey is highly dependent on the experience and knowledge of the respondents. These questions were therefore involved to make sure that the respondents were suitable qualified to take part in the survey. Respondents; ten (10%) worked for clients, fifteen (15%) worked for consultants, tweenty (20%) worked in higher education, (50%) worked for contractors, and five (5%) worked for other administrations such as educational and humanitarian (governmental) directorates (Figure 5)

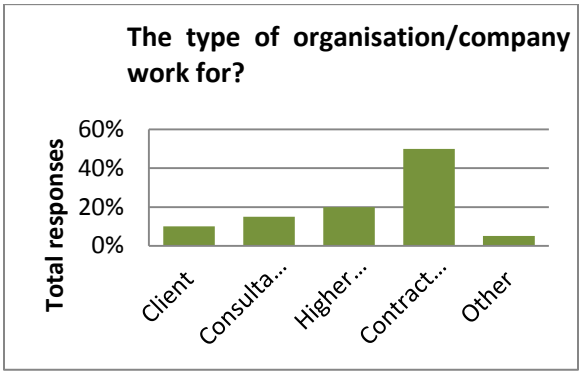

Fig. (5): Respondents type of organization

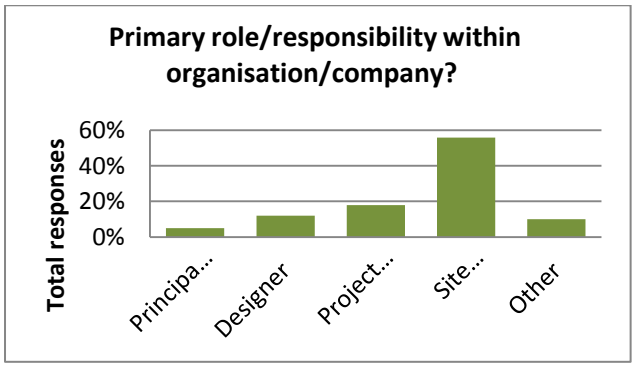

Fig. (6): Respondents role within organization

When the survey asked related to their roles within the organizations, more than half of the respondents (55%) stated they were site engineers, 20% were project managers, 10% were designers, 5% were principal designer and 10% were others like construction team leader (Figure 6).

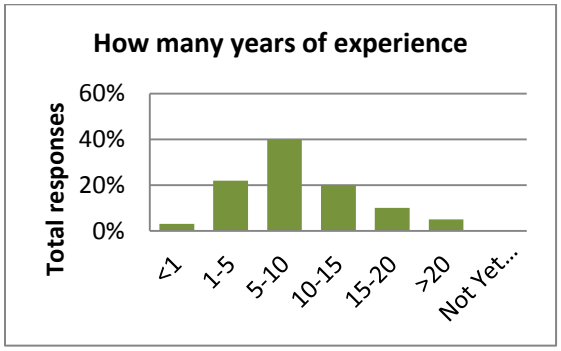

Fig. (7): Experience of respondents

Figure(7) related to the years of experience of the respondents. The largest group (40%) had 5-10 years of experience, followed by 22% with 1-5 years, 20% with 10-15 years, 10% with 15-20 years and 5% with more than 20 years of experience. The results from Figure(7) agree that the respondents have widespread ranges of experience and it can be determined that they all have adequate knowledge to take part in this research.

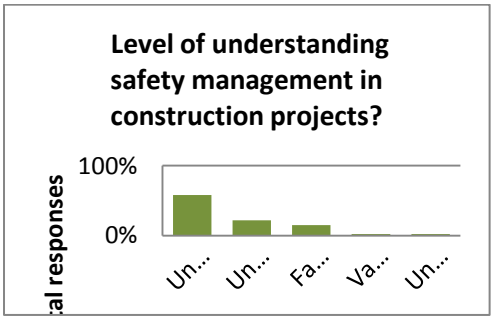

Fig. (8): Respondents understanding of safety management

Figure(8) shows fourth survey questions respondents answers, when they asked regarding understanding levels of safety management in construction projects. Results show that most the respondents (58%) showed that they understand well, 22% of respondents indicated they understand very well, and 15% were familiar with the concept, while just 2% of respondents were unfamiliar with it (Figure 8). Thus, wide range of understand well of safety management participated in this questionnaire which could add more to this research.

2.2 CONSTRUCTION PARTIES' ROLE IN HEALTH AND SAFETY

The percentages of respondents working in organizations involved H&S care on-site represented in Figure(9). Giving to the results a huge percentage of organizations (83%) involve H&S care on sites, while only 17% of organizations did not involve H&S care on sites

Fig. (9): Organisations care about H&S on sites

The H&S risk of construction processes to the lives and wellbeing of workers could be minimized crucially with the well practicing role of all construction parties of construction processes, but it is essential to determine which parties have the key role in minimizing the H&S risk. Figure(10) shows that most of the respondents (44%) believed that contractor has a major role, more than quarter (29%) indicated the project manager, 10% of respondents indicated the principal designer, 7% of respondents indicated the designer, 5% of respondents indicated the client, 3% of respondents indicated the consultant and 2% of respondents indicated the other.

Correspondingly, by reducing construction related H&S risks to employees, the project manager and contractor has the major roles. The H&S problems in the construction industries may cause because of lack of awareness of safety problems among construction parties such as contractors and project managers.

It is clear that a good relationship between the construction parties on the same site is imortant in minimizing H&S risk, principally between contractors and designers to certify a safe design and construction. H&S standards in design significantly would be better by minimizing communication gaps between contractors and designers.

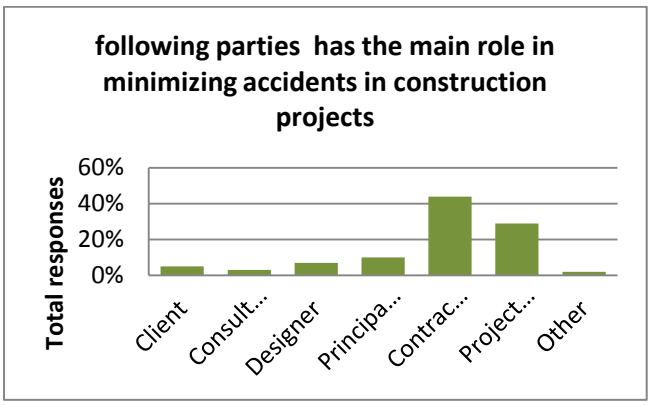

Fig. (10): Respondents views regarding the role of construction parties in reducing accidents

3. CONCLUSIONS

From the examination, site visits, poll study and from the discussion with the project supervisors we come to following conclusions.

• Workers were discovered undeveloped, untalented and ignorant about the security measure and utilization of equipments.

• Workers was unconscious with such an accidents.

• Workers were found being careless with the utilization of equipments.

• Employees was giving less need to wellbeing and security the executives.

• Safety trainings and wellbeing mindfulness programs has been not conducted.

Laborers were discovered uninformed about the work act. With the increasing construction works the accidents has likewise increased bounty. We recommend the resulting for the laborers wellbeing:

• Safety trainings should be given to laborers.

• Should create mindfulness about type of accidents

• Workers should be told about the use of equipments.

• Safety equipments should be given positively.

• Safety supervisors should be distributed.

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