

A Qualitative Analysis of the Occupational Health and Safety Management Practices in Pakistani Construction Industry

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Abstract

The construction industry has been recognised as one of the most hazardous industries. Projects in the construction sector are reputed for poor health and safety records when compared to other similar industries. Although there is an improvement on the health and safety performance in industry, the injury rate of the industry is still one of the highest when compared to other industries. Beside causing human tragedy and economic losses, health and safety management practices also effect the productivity and reputation of the construction industry. Risk and hazards arising due to poor health and safety management practices which result in injuries and fatalities in few cases. The aim of this study is to explore the perceptions of health and safety personnel regarding health and safety management practices on the construction sites. Eighteen semi-structured interviews were conducted in this study to explore the views about health and safety on the construction projects in Pakistan. The participants in this study are mainly health and safety officers, project managers, project engineers, health and safety coordinators, and project directors engaged in construction projects. The findings of the study reveal that health and safety personal perceive productive activities on construction sites as hazardous and risky. Furthermore, ten different health and safety management practices have been highlighted, health and safety policies and documentation, training and orientation, management commitment and employee's involvement in health and safety, accident investigation and reporting system, health and safety meetings, toolbox talk/communication and feedback system, use of personal protective equipment, fall protection system, health and safety inspection on site and rewarding system, and health and safety environment on site. Three health and safety management practices were missing in the analysis from the Pakistani construction industry i.e. health and safety rules and procedures, occupational health and safety committee, and hazard identification, risk assessment and risk control (HIRARC). Other than that, two different themes highlighted in the further discussion about health and safety were types of accidents and its causes, and lacking regulation in Pakistan. Therefore, there is a need for a localized health and safety department and awareness programs at the government level to foster a commitment to improve health and safety at construction sites. Further research is required to understand the implementation of health and safety management practices from the planning, execution until final stage on construction projects in the Pakistani construction industry.

Keywords: Construction, health and safety, health and safety management practices, Pakistan.

1. Introduction

The construction sector is viewed as an accident-prone industry. Construction industry is one of the major industries in the world. Some of the achievement of this industry is in rebuilding areas that was devastated by both natural and man-made disasters and providing power this industry has conferred great benefits on humanity. However, there is a price to pay for this continuous growth and activity of this

industry. The construction industry is currently recognized as a major economic force and one of the most hazardous industries. Accidents not only result in considerable pain and suffering but have shown impact on productivity, quality, time, and overall negative affect the environment. Consequently, added the cost of construction (Gul et al., 2019). An effective health and safety management practices may prevent accidents at construction sites.

Studies on health and safety management practices in the field of construction reiterate the poor health and safety performance at construction sites as a global phenomenon (Zhou et al., 2013). It has been established that poor health and safety management practices among contractors and their workers significantly contributes to the poor health and safety performance and this is reported in construction-related studies (Haslam et al., 2005; Choudhry and Fang, 2008, Basar et al., 2018). There have also been complexities experienced in the industry due to changing health and safety management practices, changing technology, construction methods, clients' demands, construction materials and the changing environment have made hazards and risk controls more difficult (Odeyinka et al., 2006). It is evident that some health and safety management practices are principally responsible for poor health and safety performance at construction sites. However, it is evident that health and safety management practices are within the control of the contractor whom may not be able to influence others as identified factors. Hence, improving health and safety management practices could result in reduced accidents at construction sites.

Although it is difficult to obtain accurate statistics of an industry in which many accidents are undetected and unreported, in many countries' fatal accidents involved loss of working time, frequently exceed compared to any other manufacturing industry. The contributions to high rate of accidents are characteristics of the industry, which distinguish it from the rest of manufacturing industry. The statistics emerging from construction industry highlights the need for adopting health and safety management practices in the health and safety performance of projects. According to the International Labour Organization (ILO, 2013), an estimated 2.3 million people die every year from work-related accidents and diseases, and there are 313 million non-fatal accidents per year.

Furthermore, In the United States, 20% to 35% construction work-related fatalities are caused by fall from height (Derr et al., 2001; Huang and Hinze, 2003; Lopez, 2008). In the UK it is 50% (Abubakar, 2015; Brace et al. 2009) whereas 55% for the repair and maintenance works in Hong Kong (Chan and Chan, 2004; Chiang, Chan, and Lok, 2006; Williams, Hamid, and Misnan, 2018). Chi and Han (2013) also stated that on every workday, more than three workers do not return home due to fatalities experienced at construction sites in the United States of America (USA). Developing countries, like Pakistan, has high potential of injuries due to labour-intensive in nature which is heavily depended on the workforce of skilled and unskilled workers with different educational backgrounds. Similarly, majority of accidents to Pakistani construction industry are due to falling from height, other than that lifting activity, electric shocks and struck by objects are few other reasons (Gul et al., 2019; Choudhry and Zahoor, 2016; Farooqui, 2012; Hafiz et al., 2017; Hassan, 2012; Khan, 2017; Mawra, 2016; Rizwan, 2015; Zahoor et al., 2015a, 2015b). Hence, the statistics suggest that poor health and safety performance is a global problem.

Poor health and safety record show a rise to poor project performance which is commonly observed in the construction sector. It has been reported that accidents lead to an increase in operating cost of projects (Hinze, 1997; Wilkins, 2011). These could be due to poor health and safety management practices, poor productivity, poor care of victims in terms medical cost, loss of person-hours, absenteeism, and an adverse impact on the image of the organization. The need to improve health and safety at construction sites has been a subject of several years of research (Koehn et al., 1995). It should be noted that it has reiterated high rate of injuries and death of workers that can be linked to poor health and safety management practices like inadequate training, and insufficient knowledge of health and safety management practices (Wilkins, 2011). Thus, this necessitates explains need for a study to be carried out

to understand how the personnel of health and safety view health and safety management practices at construction environment.

As highlighted in the opening paragraph, arguments and evidence indicates that the construction industry has a poor health and safety record. Even though Pakistan is a member of the ILO, health and safety provisions but conventions are not properly implemented (Gul et al., 2019). In a similar vein, Salman et al. (2016), asserts that there is no well-defined mechanism for policies prescribed for health and safety to Pakistani construction industry. Therefore, contractors and employees are left to use their discretion. Gul et al. (2019) suggested that, construction workers who usually execute the task in an unhealthy and unsafe environment are linked to poor productivity. Furthermore, it is known that research provides a body of knowledge that guides a discipline. Reviews of past published and unpublished studies in construction management-related disciplines in Pakistan reveal that health and safety-related research are limited (Zahoor et al., 2016; Azhar and Choudhry, 2016; Gul et al., 2019). Hence, this paper presents a study that assessed the perception of health and safety personnel and provides valuable insights into the health and safety management practices in Pakistani construction industry using a qualitative approach.

2. Improving Health and Safety Performance in the Construction Industry

Health and safety are economic as well as humanitarian concerns that require proper health and safety management control. The benefits of health and safety includes reduced injuries, reduced property damage, reduced construction time, improvement of morale, enhancing industrial relations, high productivity, reduced cost and enhanced quality. The other benefits include less compensation of insurance, less hidden costs, improved supervisor morale, increased efficiency, and improved marketability. Most of the accidents at construction sites are preventable through implementation of effective health and safety programs. Although effective health and safety programs can prevent or reduce injuries, not all contracting organizations implement health and safety programs. Good health and safety performance are also related to management and applying excessive pressure by any means to the workers results in increased injuries.

Scholars have noticed that different people may perceive occupational health and safety in different ways (Gul et al., 2019). Implementing health and safety management practices at construction sites can be challenging. There are several possibilities that explain these challenges; such as migration of workers, method of worker employment, work standards, different backgrounds and experience (Mohamed et al., 2009). Adoption of health and safety management practices attracts little attention from the construction sector. This is because stakeholders are largely profit-driven and gives a little consideration to health and safety (Priyadarshani et al., 2013; Windapo and Jegede, 2013). To address poor health and safety performance it is important to understand problem of the study (Levy and Henry, 2001; Creswell, 2012). Literature shows that there is a general preference in the construction industry, it is important to understand them.

Research in health and safety construction-related disciplines has a vast history. Agumba, Pretorius and Haupt (2013) define health and safety management as “tangible practices, responsibilities, and performance related to health and safety, including the association between health and safety management, climate, and culture”. Smallwood (1995) maintains that management commitment to health and safety is reflected through organization’s values, policy, goals, program development, resource allocation, behaviour modelling, and injury analysis. However, health and safety management practices should be tailored to meet unique needs of the worker. Agumba, Pretorius and Haupt (2013) further categorize health and safety management practices into five basic elements, namely top management commitment and involvement in health and safety, employee involvement and empowerment in health and safety, project supervision and project health and safety planning, communication in health and safety, and health and safety resources and training. Whereas, Gul et al. (2019), have categorize health

and safety management practices into twenty three basic elements (Refer to Table 02), namely management commitment, occupational health and safety education and awareness training, personal protective equipment, workers involvement in health and safety, accident reporting and investigation, health and safety rules and procedures, health and safety communication and feedback, health and safety meetings, plant and equipment maintenance, occupational health and safety documentation, controlling the workers occupational health and safety behaviour, policy of new recruiting workers or staff, resources and insurance policies, health and safety environment on site, occupational health and safety committee, toolbox meetings, fall protection system, housekeeping storage and sanitation, implementation of occupational health and safety policy and program, reward system, orientation and specialized training, health and safety inspection on site, and hazard identification, risk assessment and risk control (HIRARC). Researchers such as Cheng et al. (2004), Cheng et al. (2012), and Ismail et al. (2012) opinions about limiting human errors will reduce accidents, which only can be achieved by employing health and safety management practices at site. When the system is driven positively to reduce hazards and risks, workers will adopt good behaviours to foster positive commitment to health and safety. Thus, understanding how personnel perceive health and safety may lead to valuable insights that can be improve on-site health and safety of construction.

Windapo and Jegede (2013) are of the opinion that fatalities, injuries, and deaths are mainly caused by unsafe and unhealthy practices of contractors and workers. Contractors prefer to spend less on Personal Protective Equipment (PPE), employ less-experienced workers for cheap labour and only care for the profits. Similarly, from a qualitative survey, Khosravi et al. (2014) identified eight main categories of factors that influence workers' unsafe and unhealthy behaviours at construction sites. These factors include society, organization, project management, supervision, contractor, site conditions, work group, and individual characteristics. Workers perception of risk, health and safety management, health and safety regulations as well as procedures have been linked to their attitude towards health and safety of construction sites (Mohamed et al., 2009). The above studies reveal that workers have a self-rated competence and their behaviour relates to their health and safety responsibilities.

3. Research Methodology

The investigation reported here is part of an on-going study targeted at 'health and safety management practices of contractors in high-rise building projects in Pakistani construction industry'. Literature shows that there is a general preference for quantitative research method in construction management studies focused in Pakistan (Farooqui, 2012; Zahoor et al., 2015 a, b; Zahoor et al., 2017). On the contrary, a significant advantage of qualitative data collection method is that it provides deep insights into the study's problem (Levy and Henry, 2001; Creswell, 2012). Hence, a qualitative semi-structured interview method was suggested for this study to provide an alternative perspective towards the health and safety management practices as well as problems at construction sites. The interview questions were designed to explore the perception of health and safety personnel regarding health and safety management practices at construction site, based on a systematic literature review conducted by Gul et al., (2019).

The interviews were held with health and safety personnel in the Pakistani construction industry (refer Table 01). Ethical or protocol issues were addressed such as formally inviting the interviewees to the interview session, explaining the purpose of the research, and asking for the health and safety personnel consent based on a voluntary decision to be interviewed. The contracting firms that were selected for this study were registered with Pakistan Engineering Council (PEC). There are 273 companies registered under PEC, the selected companies were categorized as C-A and C-B by the Pakistan Engineering Council (PEC), based on the cost of construction put-in-place within the duration (one/two/three years) for the renewal/upgrading of each company's license. These categories were selected for the following reasons:

(a) During the research it was observed that the companies below category C-3 (relatively small firms) did not have specific health and safety manuals and appeared to provide little consideration for worker health and safety. The reasoning that was offered was that it is too expensive to implement health and safety on site for relatively small construction companies involved in local projects.

(b) Most of the companies performing international projects fall between categories C-A to C-B and it is mandatory for them to implement health and safety on site as it is not only a vital part of their contractual obligations, but their progress payments depend on their overall performance including their performance in worker health and safety on site.

Only few companies out of those companies are working in the construction industry specifically on high-rise building projects in all over Pakistan. As mentioned by one of the interviewees “very few companies are working for high-rise buildings”. (Interviewee A) Whereas, “In Pakistan there is no specific body of organization at the government level handles registration of construction companies”. (Interviewee M) mentioned “As per my knowledge there is no specific organization by the government for improvement of health and safety implementation, there should be an organization or the department by the government which should control and collect accidents data and take actions for the improvement”. (Interviewee L)

The selected companies were those undertaking projects during the time of the research. Further questions were asked to prompt discussions in relevant areas during the interview. The interviews were recorded (with permission of interviewees) and were conducted in English language. The NVivo software (version 10) for Windows was used for the data analysis. As highlighted by Edlund and McDougall (2013), NVivo software offers several benefits and advantages. According to Ryan et al. (2011), one of the key advantages of using NVivo software is it facilitate to decrease the problems and difficulty of ‘drowning in data’ by allowing data to be separated into nodes and categories; this provides a simpler structure for discovering emergent themes. Thematic Analysis was used to generate an understanding of the interviews. The interviews were analysed based on each question separately. All interviews were transcribed, and then carefully read repeatedly to generate codes that were relevant to the questions asked and subsequently assist in developing the required theme.

3.1 Participants of the Study

Eighteen (18) participants/interviewees were interviewed according to their own convenient time. The interviewees (Table 1) were all male adults, and they had more than five years of work experience, which indicates adequate work experience to provide responses that reflect actual practices at construction sites. The interviewees were engaged in few building projects (residential, commercial and high-rise buildings). This reveals that the interviewees had vast work experience at different construction sites. This will enhance the quality of the responses on health and safety issues. Among the eighteen interviewees, only eight had the higher education and certification. The other ten interviewees were basically gone through an informal training, i.e. working as an apprentice till they were set to work on their own.

<i>Sr No.</i>	<i>Participant</i>	<i>Position</i>	<i>Years of experience</i>	<i>Level of Education</i>
01	Interviewee A	Project Director	27-28 Years	Post-graduation from US
02	Interviewee B	H&S In-Charge	12 Years	BE Mechanical
03	Interviewee C	Project Engineer	9 Years	BSc Technology
04	Interviewee D	Project Manager	16 years	BE Electrical Engineering
05	Interviewee E	HSE Manager	6 Years	BE with Various Certificates
06	Interviewee F	GM Project	11 Years	BE Civil, MS Geotech
07	Interviewee G	Head of HSE	15 Years	BE Chemical, MSc Total Quality

				Management
08	Interviewee H	HSE Manager	5 Years	BE Environmental Science
09	Interviewee I	Chief Operating Officer	34 Years	BE Mechanical, ME Structural Engineer, PhD Structural Dynamics
10	Interviewee J	Senior Environmental Health and Safety Engineer	10 Years	BE Civil
11	Interviewee K	Project Manager	19 Years	BE Mechanical
12	Interviewee L	HSE Engineer	10 Years	BE Electrical Engineering, MS Environmental Design
13	Interviewee M	HSE Manager	10 Years	BE Mechanical
14	Interviewee N	HSE Engineer	9 Years	BE Energy & Environmental Engineering, Post-Graduation Certificates Environmental Energy
15	Interviewee O	Construction Supervisor	14 Years	B Tech
16	Interviewee P	HSE Coordinator / Engineer	12 Years	BE Chemical, MSc Environmental Energy
17	Interviewee Q	HSE Manager	16 years	BE Agriculture, Masters Agriculture, Certification
18	Interviewee R	HSE Coordinator	13 Years	BE Chemical

TABLE 01. The position of interviewees

4. Data Analysis

The interviewees were asked to reflect on the common health and safety management practices done on their construction sites, ten different health and safety management practices were found from the analysis of interview transcripts (Refer to table 02) i.e. the health and safety policies and documentations, training and orientation conducted on-site, management commitment/employees' involvement in health and safety, accident investigation and reporting system, health and safety meetings, toolbox talk/communicate and feedback system, use of PPE, fall protection system, health and safety inspections on-site and rewarding system, and health and safety environment on site. In this regard Gul et al. (2019) have collected and investigated 23 health and safety management practices using the systematic literature review (Refer to table 02) and has found similarities in the analysis of health and safety interviews resulting in the emergence of ten main health and safety management practices. Three health and safety management practices were missing in the analysis of interview transcripts from the Pakistani construction industry i.e. health and safety rules and procedures; occupational health and safety committee; hazard identification, risk assessment and risk control (HIRARC). Then, the general views were taken on ways to ensure safe and healthy construction site, how they manage and train their workers, major causes of accidents, challenges faced by them and how they overcome those challenges, and so on. Two different themes were highlighted that is shown in further discussion about health and safety's type of accidents and its causes, and lack of regulation.

The following sections present the themes that emerged from the interview data, including supporting quotes from interviewees.

4.1 Health and Safety Policies and Documentations

Health and safety policy are defined as a published statement showing the organization's thinking and goal affiliation to the management of health and safety practices. Dorji and Hadikusumo (2006) explained that occupational health and safety policy is a written statement of rules and goals, which can explain top management's commitment to make sure safe working methods, are used and environment at the construction sites is also safe. However, it was also mentioned by one of the interviewees that:

Health and safety policy are to save the environment, save the workers, save your neighbours and all the living specification so that surrounding environment cannot be disturbed or affected by the work. (Interviewee N)

In support of that another interviewee mentioned that:

Our first aim is to safe our people from beginning till the end of the project, our concerned is that nobody should be harmed or no incident should take place, we have to conduct all practices safely because if anybody is practicing unsafe act then they are going to face accident on site. (Interviewee Q)

Gul et al. (2019) have highlighted the implementation of occupational health and safety policies and programs, occupational health and safety documentation, and resources and insurance policies of workers as three different health and safety management practices, based on the understanding, all these three practices should be combined as one practice. The findings also reveal that health and safety policy and documentation can be further categorized into four different types of policies namely, medical policies, health insurance policy, risk assessment policy, and goal to zero Last Time Injury (LTI) policy (Interviewee A). Gul et al. (2019) mentioned that the construction site manager should have a written health and safety policy paperwork and should be displayed on each of the site. One of the interviewees mentioned that "There is no insurance policy for the workers in Pakistan, very low limit of the insurance policy is implemented here in Pakistan" (Interviewee B). However, another Interviewee mentioned that "The health and safety policy is not displayed to everyone" (Interviewee C). Hence, for the better understanding of the workers' health and safety policy, the documentations should be totally transparent and should be displayed at the management level as well as the workers level on each of the construction sites.

4.2 Training and Orientation

Health and safety training orientation is one of the health and safety management practices that was mostly used as a standard for health and safety performance across occupations and industries. This is because it often provides way for organizational accidents prevention and control by educating workers about the importance of compliance to health and safety rules as well as procedures (Cooper and Cotton, 2000; Diaz Cabrera et al., 2007).

All participants recognise the importance of training, although most assume that training on health and safety is to be carried out by the workforce.

We also discuss the plan and procedures to follow basic environmental plan, waste management plan, our management plan, info about different disease can happen on-site. Every new staff must go through induction training or orientation training where we highlight the safety hazard and precautions. (Interviewee H)

In the similar vein, Interviewee I mentioned that "we send our employees to get education and training from other countries and they come back, they implement those practices in our organization". Similarly,

in the study of Gul et al. (2019), highlighted that the management should make a systematic, comprehensive health and safety training programs for the new workers provide a teacher mentor for them and use a partner system to help accommodate them to the safety, health, and quality system.

Others appear to support this perspective and they are clear that every member of the workforce should be trained:

When any new staff joins our industry we provide them the proper induction training in which all aspects of health and safety are covered to provide them all the basic knowledge of our industry, how our industry works, what is hazards condition, hazards materials of our industry, hazards in high-rise building, if you work at height what type of precautions should require to deal with work at height, we provide them code of conducts, we provide them the whole policy in form of booklet and so on. (Interviewee P)

We have specific orientation for the special tasks, for example, an electrical job orientation and training will be different and scaffolding of job training will be different, similar for work at height, the training will be different, and hazards will also be different. We have fresher training every year where we give them training to recall practices regardless of number of years he has worked in the company, even if he has joined the company for 20 years or joined recently, this is compulsory training for all workers. (Interviewee R)

Furthermore, Gul et al. (2019) have compartmentalised occupational health and safety education and awareness training programs, OSH education orientation and specialized training, and HSE policy for new recruiting workers or staff into three different health and safety management practices, but the theme of all above three practices is to educate and give the proper health and safety training to the new and existing workers and staff. Whereas, based on the finding of the interviews this study combines them as one main practice that is training and orientation.

4.3 Management Commitment and Employees' Involvement in HSE

Management commitment is known as the association and engagement to an employer and their employees in action to achieve the objective in health and safety issues. However, it didn't only play a major part in Occupational Safety and Health (OSH) at construction sites but shown important factor affecting the achievement of an organization's health and safety program (Gul et al., 2019). Although the interviewees did not attest to any onsite health and safety policies, regulation or rules, interviewees perceived that some managers committed to their wellbeing while others were not. According to interviewee H, "Management should be strongly committed in the project, if they are not committed then the health and safety officer cannot work on any activity". Subsequent interviewee agrees that:

Our management is highly committed with our staff as you can see, we have the long-term policy for attention of the staff and workers as they are satisfied with the company that is why they are with the company for a long time. (Interviewee I)

On the other hand, health and safety management practices may include commitment of top management, commitment of top management with health and safety staff is very important. They are of the opinion that, health and safety is not really supporting on most sites. According to interviewee Q, "We have the support of the management, but we can't imply as 100% that they are supporting us on health and safety".

However, the following interviewee is of the opinion that:

Our management is committed but we can't imply that they are totally committed to the health and safety but in construction it is a fact that there is a lot of clashes between the work and safety or in other words

we can say that loopholes are lacking i.e. if they have some urgent work they will ignore health and safety measurement. (Interviewee R)

Whereas, worker's involvement in health and safety has been considered as a conclusive point in health and safety management practices (Cox and Cheyne, 2000; Dedobbeleer and Beland, 1991; Gul et al., 2019). That gives workers more power during processes like involvement of workers in health and safety-related decision making, association in finding health and safety problems, and consulting workers about health and safety issues. There were few issues highlighted about workers that were language, as language is one of the issues for communication between the workers' health and safety personnel.

As we have workers coming from the remote area, language is one of the issues. Besides that, education level is one of the issues, they can't even understand the signage. Sometime the worker complain that they have been working in this area for few years, so they don't feel comfortable wearing safety gadget as they feel it is burden to them, so this is one of the reasons why accidents are happening on-site. (Interviewee P)

Language is one of the big problems if worker only speaks specific language i.e. URDU then the health and safety person in-charge should be URDU speaking so that it is easy for the workers as well as health and safety personnel to communicate hence I prefer the health and safety person in-charge to speaking same language as workers on-site. (Interviewee N)

On the other hand, Gul et al. (2019) have considered management commitment, workers involvement in health and safety, and controlling of workers occupational health and safety behaviour as three different health and safety management practices but from the analysis of interviews it has been found that workers involvement and workers behaviour totally depends on the management commitment, wherein, if the management is highly committed towards the health and safety, then behaviour of workers will be positive but if the commitment of the management is not 100% as mentioned by interview Q, then the behaviour of the workers will also not be 100% positive, Whereas, from the finding of the interviews is seemed that all the above health and safety management practices can be framed in to one health and safety management practice, that is management commitment and employees' involvement in HSE.

4.4 Accident Investigation and Reporting System

Accidents happen for uncountable reasons, some of the reason could be machine failure, unsafe work methods or poor housekeeping, but getting information about these incidents can help to identify the reasons and helps to decrease the chances of accidents reoccurrence (Gul et al., 2019). Accident reporting and investigation varies from organization to organization and site to site (Gul et al., 2019). The following are some excerpts from the interviewees:

Accidents occur because of some unsafe conditions, most of the time workers try to take shortcuts instead of using PPE properly, for example when someone holding the scaffolding suddenly drops it then it is considered as unsafe act, hence shortcuts are one of the reasons that cause accidents on-site. (Interviewee R)

The interviewee revealed about the classification of accident investigation system in the associated company, like personal injury e.g. first aid case, medical treatment case, lost or injury case and environmental damage e.g. leaders died in the injury. The team investigates the cases based on the severity of the accident, if minor accidents then they just check on site, but if major accidents occur, they investigate on-site and as well as head office or with the involvement of CEO. (Interviewee G). In case of any accident, the health and safety engineer or supervisor directly needs to inform health and safety

manager about the accident, later a detailed report is prepared by health and safety senior engineer after investigating the accident at site or accident location by interviewing the workers on-site. (Interviewee O)

4.5 Health and Safety Meetings

Health and safety meetings are a vital part of a health and safety awareness program, and also regarded as one of the best ways to encourage employees to get health and safety out of the classroom into the workplace (Gul et al., 2019). The purpose of health and safety meeting is to make sure that all construction team knows about health and safety issues (Holt, 2008). The following are some excerpts from the interviewees:

Health and safety meetings are conducted among the workers of safety department who attends these meetings conducted by site engineer and safety manager, in which, all highlighted issues are discussed as mentioned by the workers, and representative of the workers is also involved in these safety meetings. (Interviewee L)

Most hazards and major cause of accidents are being picked out and discussed in those meetings. The possible route causes are being identified and discussed, such as possible lack of resources, lack of supervision or falling of objects. (Interviewee P)

Other interviewees mentioned the health and safety are not necessary or not regularly held at their construction sites:

There are no proper safety meetings, emergency meetings will be called only in case of incidents. (Interviewee C)

Meetings will be called for only in case of emergency to discuss with health and safety personnel and Environmental Health and Safety (EHS) team to execute safely measures, hence, these types of meetings only take place if any issue is highlighted or not resolved on-site. (Interviewee M)

From the results of the interviews it can be concluded that health and safety meetings should be properly conducted by health and safety officers and properly monitored by the top management for the better performance of the construction project.

4.6 Toolbox Talk/Communicate and Feedback System

Toolbox talk (TBT) meetings are very common way of communication in the construction industry. Builders and principal contractors frequently require their sub-contractors to conduct toolbox meeting (Cohen, 2002; Masood et al., 2012). However, it was also mentioned by one of the interviewees that:

The health and safety manager as well as safety officer deliver the lectures every morning to workers on how to use harness while working on heights besides that, they also demonstrate how to use PPE like shoes and helmets they explain the importance of these precaution which is necessary for the workers. Different type of drills is conducted namely, drills for firefighting in the case of emergency, and about the process of evacuating or rescuing a person out of site in case of emergency. (Interviewee D)

On the other hand, another interviewee mentioned that:

Most of the labour are from remote areas of Pakistan, hence it is crucial to educate them and conduct workshops and as well as create awareness about TBT. Toolbox talk will be conducted on a day to day basis by health and safety supervisor, during TBT general health and safety, mandatory of PPE, previous accidents and knowledge about different hazards are explained, furthermore, they are educated that health

and safety responsibilities are not one person's responsibility rather it is a collective responsibility. (Interviewee E)

Most of the Pakistani labours are illiterates, they refrain from adhering with the instructions as it reduces the speed of the work, but they are motivated during toolbox talk and the importance of health and safety implementation are highlighted. (Interviewee F)

The toolbox meeting has some benefits, for example, it can help to meet the legislative requirements in order to provide an effective consultation process. It is best used as an additional construction and training tool rather than replacing, systems and procedures. It acts as an excellent forum for conducting, reviewing, and consulting on risk assessments and safe work procedures (Gul et al., 2019).

Whereas, few other interviewees mentioned that they have a very good TBT system in their companies:

A very good communication system has been implemented, as it is not necessary to have any hidden policy, so all the hazards are reported, the health and safety officer is required to identify if something has occurred and they must report and inform to their supervisor; hence the supervisor's responsibility is to mitigate all the activities. (Interviewee K)

Toolbox talk is conducted every day in the morning at every corner of the industry, every department has their own TBT, for example workers working at height have their own TBT that discusses about hazard and precautions to be taken as well as about full-body harness. PPE department starts checking all the equipment's they train their staff with regarding how to use PPE. (Interviewee P)

On other hand, some interviewees highlighted that two types of TBT are held in their construction sites:

Two types of toolbox talks are conducted one that starts in the early morning, which involves scaffolding folders, labour, general labour, electrician, and so on. The second, is conducted on special issue of toolbox talk like scaffolds, electrician and they conduct on specific task. (Interviewee N)

According to Gul et al. (2019), toolbox talk meeting, and health and safety communication and feedback as two separate health and safety management practices but based on the interview results it has been observed that toolbox talk, and communication and feedback system are same practice. In TBT the supervisor is the one who briefs about the task and the hazards related to any specific task, on the other hand in communication and feedback system the discussion can be two-way in between supervisor and worker, or workers and top management.

4.7 USE of Personal Protective Equipment and Plant and Equipment Maintenance (Crane operation, Lifting, Scaffolding & Ladders)

Personal Protective Equipment (PPE) is important for job-related occupational health and safety purposes, it points to protective clothing, helmets, goggles, gloves, other garment or equipment made to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals, and inflection (Gul et al., 2019). Occupational Safety and Health Administration (OSHA) U.S. stresses on the use of PPE to decrease workers exposure to hazards when engineering and administrative controls are not good enough to reduce those exposures to admissible levels (OSHA, 2006). With regards to the use of PPE, the interviewees have indicated that they were familiar with some PPE such as, goggles, ear plugs, hand gloves, helmet (hard hat), boots, reflective jackets, safety shoes, safety belts, safety harness, and so on, which are similarly mentioned in the study of Gul et al., (2019). However, the use of PPE was not regarded as important or necessary. Interviews expressed their opinions on that:

Interviewee G mentioned that “PPE is one of the major issues, as local staff do not know how to use PPE”, and “There is no proper certification for equipment, it only depends upon mechanics”. (Interviewee C). Similarly, interviewee K mentioned “We have tower cranes, lifts, folding, but in Pakistan lacks new technique”.

The workers do not understand the need to wear health and safety equipment due to various reasons as indicated by some of the interviewees:

Sometime the workers complain that they have been working in this area for few years, so they do not feel comfortable wearing safety gadgets and they feel like it is burden to them. (Interviewee P)

Most of the workers are not comfortable wearing safety items and ignore it. (Interviewee H)

Workers have no interest in using the safety items (workers are fine without it and feels uncomfortable wearing safety item). (Interviewee C)

However, all the heavy machinery used at sites like cranes and lifting activities are inspected by third party. However, it was also mentioned by one of the interviewees that:

For all heavy materials third party verification is acquired, for example, crane loaded elevator and folding or lifting. They also have the checklist system for all the equipment to verify the validity and usage of the equipment. (Interviewee Q)

In support of the above, another interviewee mentioned that:

They have third-party certification system for all heavy equipment like crane, lifting equipment, boom truck, chain clock, circle or lift belt and any heavy material activity needs certification of third-party before using it. Other small PPE and equipment need to be verified before using it on daily bases like ladders and drills. (Interviewee R)

Gul et al. (2019) have stated that personal protective equipment, and plant and equipment maintenance are two separate health and safety management practices; but based on the interview results it has been noticed that plant and equipment maintenance are actually the part of personal protective equipment. To use all these plants and equipment it is essential to wear those PPEs, Therefore, it has been considered as a single health and safety management practice.

4.8 Fall Protection System

The most common type of accident at construction site is fall from height or falling objects (Gul et al., 2019). As it has been highlighted by one of the interviewees “The biggest threat in high-rise projects is opening inside the building and barrier action all around the building” (Interviewee D).

On the other hand, fall protection systems are used in most of the construction sites as highlighted by interviewees:

According the interviewee the site has proper fall protection system when the workers are working at height, the scaffolding platform is ejected and monitored by site scaffolding inspectors. (Interviewee E)

Another interviewee mentioned that the company is very much concerned about the safety, it starts over the protection from the falling heights, so if the worker goes higher, it is important to take more measurements and must ensure that the person is safe while working at height. (Interviewee K)

Furthermore, it was commented by an interviewee that prior to start working on high-rise building work they will ensure the falling protection like extra cages are in place, folding platforms are kept ready which will help the carpenter shuttles, lifeline is also used where the workers use harness and hang all the outer ages, other activities are stopped and no one is allowed inside hard-barricaded area. (Interviewee N)

Similarly, it was also highlighted in the study of Gul et al. (2019), if a worker is at a height of four feet or more means the worker is at risk and need to be protected.

4.9 Health and Safety Inspection on Site and Rewarding System

The health and safety inspections on site have been an important aspect for maintaining safe conditions at workplace. Health and safety inspection on-site should be under strict health and safety audits, which includes, health and safety inspections, inspection of documents and interviews (Gul et al., 2019). However, it was also mentioned by one of the interviewees that:

Health and safety inspections are the main component as followed by health and safety standards for verification of those compliance to meet the standards. Whether those standards are been complied or not by particular contractors or employee, however, inspections need to take place namely, inspection of equipment, inspection of workers, inspection of area, inspection of the system, inspection of documents, all these inspections are conducted when health and safety inspector or health and safety offers a visit to the site. Safety audit and safety survey are conducted onsite moreover, comprehensive reports are developed at the end of the survey and those reports are shared with the management on weekly bases. (Interviewee P)

In support of the above, another interviewee mentioned that:

The associated company has implemented the health and safety policy in a good way, after every three months they have rewarding system, daily and weekly data are collected together with pictures to decide which worker is implementing good and safe practices hence the management rewards those workers with mobiles, cash award, and gifts. (Interviewee N)

On the other hand, Gul et al. (2019) mentioned that reward system is identified as one of the practices that is important to identify chances of incidents and injury rates, but it was highlighted by interviewee K “In Pakistan we don’t have much big projects and huge funding for health and safety. In other words, there is no funding and resources in Pakistan”.

Furthermore, another interviewee mentioned that “There is no such rewarding system” (Interviewee C) and interviewee E mentioned “We don’t have reward system”.

While on the other hand, few interviewees mentioned that their company has rewarding system:

The rewarding system in their company felicitates the best worker based on safety measures taken by the worker, the reward is in term of money, gifts, and certificates. (Interviewee P)

In HSE every three to six months it is essential to check the performance of workers and reward those workers who perform their work safely and follow safety measurement properly. (Interviewee Q)

Gul et al. (2019) have stated that health and safety inspection on site, and reward system are two separate health and safety management practices. However, as highlighted by the interviewee P and interviewee N that rewarding system depends on the health and safety inspections on site, only inspection on site helps

to identify whether their standards are been complied or not, from which the recipient of reward can be decided, therefore, the two health and safety management practices are been themed in one health and safety management practice.

4.10 Health and Safety Environment on Site

The health and safety environment on site have been also recognized as an important health and safety management practice, it has been further divided into four e.g. the usage of health and safety signs and symbols, erection of barriers around hazardous areas, emergency preparedness, and maintaining a register for the workers (Gul et al., 2019). The use of health and safety signs and symbols are shown as the most vital measurement for environment as of transferring health and safety information. Which includes the use of illuminated signs, hand and acoustic signals, (e.g. fire alarms), spoken communication (Gul et al., 2019). However, it was also mentioned by one of the respondents that:

Safety signage is mandatory at the site, there are different types of signage, in different languages for the understanding of the workers in their local language. The pictorial diagram and signboards are enacted when working at height, safety harness, falling objects, and tagging signage. (Interviewee N)

In support of that another interviewee mentioned that:

The associated company has different type of signage available on site in English and local language, about PPE, precautions, danger zone, alarms, belts and how to use emergency equipment. (Interviewee H)

Signage play a very important role but unnecessary signage at location that is not visible to the workers' defeats. (Interviewee P)

On the other hand, construction sites are exposed to many hazards which might affect the employees while working. After work is completed for the day, keeping a construction site clean of debris can further reduce hazards. Subsequent interviewee agrees that:

Casualties is caused by confined space at high-rise buildings but if the project is housing scheme or other big projects, then they have enough space for housekeeping every week. (Interviewee D)

For housekeeping scrubs like steel bars, woodwork shuttling, empty bags, empty drums are stored in spate place and later sold in bulk, for sanitation proper safety tanks that is cleaned every second week or as needed is maintained, proper staff for housekeeping has been recruited. (Interviewee H)

In this regard, Gul et al. (2019) have stated that health and safety environment on site, and housekeeping storage and sanitation are two separate health and safety management practices; but based on the understanding from the interviews the visibility of signage depends upon the housekeeping on site, if the housekeeping is done properly on site and the signage are visible to everyone that will reduce the risk and hazards. Whereas, health and safety signages and housekeeping are part of health and safety environment on site. Therefore, it was considered and feasible as one health and safety management practice.

5. Conclusion

Ten themes were identified through analysis during interview: (1) health and safety policies and documentation, (2) training and orientation, (3) management commitment and employees' involvement in health and safety, (4) accident investigation and reporting system, (5) health and safety meetings, (6) toolbox talk/communication and feedback system, (7) use of personal protective equipment, (8) fall protection system, (9) health and safety inspection on site and rewarding system, and (10) health and

safety environment on site. Three health and safety management practices were missing in the analysis of interview transcripts from the Pakistani construction industry: (1) health and safety rules and procedures, (2) occupational health and safety committee, (3) hazard identification, risk assessment and risk control (HIRARC). Other two themes were highlighted during the interview namely type of accidents and its causes, and lack of regulation.

The findings of this study reveal that the Pakistani health and safety personnel view construction activities as hazardous and some contractors are only interested in monetary gains. They have very little knowledge regarding health and safety construction. This is because there is no specific body of organization for health and safety at government level to check lack of health and safety equipment, and literacy rate among the workers. Health and safety personnel believe that, number of years spent in trade determines the level of risk they are being exposed to and abilities to manage based on experience. In summary, their perceptions could be linked to inadequacies of stakeholders in promoting health and safety management practices. The results of this study also highlight the need for safety training of the workforce and the commitment of the workers and employees’ involvement in health and safety. Furthermore, safety, rules and regulations at construction site should be maintained from the initial to final stage of construction. It can be concluded that, the top management has significant role in supporting the successful implementation of health and safety management practices in construction projects.

This research has established the importance and the need for health and safety management practices in Pakistani construction industry. The government and stakeholders should develop strategies and policies that will foster commitment of health and safety management practices at construction sites. Hence, the findings provide an insight to stakeholders for construction industry with regards to health and safety. Further research is needed to understand the implementation of health and safety management practices from the planning, executing until final stage on construction projects in Pakistani construction industry. Construction managers as well as health and safety officers could plan health and safety strategies with supervisors to systematically analyse work risks and hazards. This will enable management to improve health and safety climate on projects and develop health and safety culture among workers through adequate policy formulation and implementation.

Health and Safety Management Practices from Systematic Literature Review	Health and Safety Management Practices from Qualitative Interviews Analysis
1. Implementation of Occupational Health and Safety Policies and Programs 2. Occupational Health and Safety Documentation 3. Resources and Insurance policies of workers	1. Health and Safety Policies and Documentations (a) Medical Policy, (b) Health insurance Policy, (c) Risk Assessment Policy 2. Training and Orientation
4. Occupational Health and Safety Education and Awareness Training Programs 5. OSH Education, Orientation and Specialized Training 6. HSE Policy for New Recruiting Workers or Staff	
7. Management commitment 8. Workers Involvement in Health and Safety 9. Controlling of Workers Occupational Health and Safety Behavior	3. Management Commitment and Employees’ Involvement in HSE
10. Accident Reporting and Investigation	4. Accident Investigation and Reporting System
11. Health and Safety Meetings	5. Health and Safety Meetings
12. Health and Safety Communication and Feedback 13. Toolbox Talk Meeting	6. Toolbox Talk/Communicate and Feedback System
14. Personal Protective Equipment (PPE) 15. Plant and Equipment Maintenance (Crane operations, lifting, scaffolding & ladders)	7. Use of Personal Protective Equipment and Plant and Equipment Maintenance (Crane operation, Lifting, Scaffolding & Ladders)
16. Fall protection system	8. Fall Protection System
17. Health and Safety Inspection on site 18. Reward Systems	9. Health and Safety Inspection on Site and Rewarding System
19. Health and Safety Environment on Site 20. Housekeeping, Storage and Sanitation	10. Health and Safety Environment on Site (a) HSE Signages and Symbols on Site, and (b) Housekeeping on Site
21. Health and Safety Rules and Procedures 22. Occupational Health and Safety Committee 23. Hazard Identification, Risk Assessment and Risk Control (HIRARC)	Missing Practices in Pakistani Construction Industry

TABLE 02. Health and safety management practices qualitative interviews analysis

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