

OCCUPATIONAL HEALTH, SAFETY AND RISK ANALYSIS

Waqas Ahmed Khan, Talha Mustaq and Anmol Tabassum

Institute of Environmental Sciences & Engineering (IESE),
School of civil Engineering (SCEE), NUST, Islamabad
Sustainable Development Study Center (SDSC), G.C. University Lahore

Abstract: Occupational safety and health is an area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include fostering a safe and healthy work environment. This study was to assess the existing situation of occupational health and safety in the textile industries of Lahore. The study also focused to analyze the health and safety related issues in the industries along with their risk assessment and to evaluate work related diseases which affects the health of labors. Health, safety and risk analysis were carried out in large scale textile industries of Lahore. To carry out this assessment survey was conducted from workers in both industries. The questionnaire was based on working time, number of accidents, cause of accident, affected part of body, nature of injury, use of personal protection equipment's(PPE), health safety policy, first aid facility and risk analysis was based on severity and likelihood of workers. Results showed that the mostly noise level, illumination level, humidity level, and stack emission values were within the NEQS and OSHA values. Pearson's chi-square showed the significance ($p = 0.05$) relation between affected part of respondent and working section, nature of injury and working section. The overall health safety policy was not well applied and mostly workers were unaware about PPE.

Keywords: safety, work, health, accidents.

1- Occupational safety and health

Occupational safety and health (OSH) is a cross-disciplinary area and it is concerned with guarding the safety, health and welfare of people who are engaged in work or employment. Health is associated to the physical conditions of both mind and body, of all people at the workplace including the workers, contractors and visitors, and their protection from harm in the form of injury or disease. Safety is related to the physical condition at the worksite and applies to a state where the risk of harm and damage has been removed or reduced to a tolerable level. And the protection of environment is comprised of usually two types. First is the internal environment at the workplace and it is related to overall condition in the workplace. Second are the harmful conditions which are present in the external environment outside the workplace (Towilson 2003).

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The general international statistics and historical view indicates that Occupational health and safety has always been challenging (Hinze 2006) and the integration of OHS into worksite management, allocation of safety activities, and role of the employees' involvement in safety matters are the features that previous literature classifies as correlated to lower injury rates (Gallagher et al. 2001). Physical working conditions comprise of work space, and the width of the stairs, lighting, fire escape facilities, and the number of toilets. Evidence shows that the physical working conditions are often poor in the industries (Kabeer 2004; Paul-Majumder 2003; Paul-Majumder 2000; Zohir2001).

While many of the potential hazards introduced into the industry are because of the fact that the machines became larger, speedier and much more complex in operation. Also the materials and the operational processes became more complex which infused the workplace with potential health hazards. The workers had to cope with work stress due to mechanization and the demand for increasing productivity which exerted an increasing influence on their well-being (Kaminski 2001; Shannon et al. 2001; Roy 2003; Zacharatos et al. 2005).The purpose of the adopting new technologies and flexible manufacturing methods are to shorten process times and to maximize the effective work time thus increasing the speed and intensity of work. This increases stress and strain level leading to the occurrence psychosocial and ergonomic problems (Harrison 2003).In the media work-related injuries and illnesses is widely discussed but according to the international labor organization still the actual numbers not known accurately (ILO 2003). According to data of 2003 the accidents at work and diseases annually take some 2 million lives world-wide and they cost an estimated \$1,250,000 million US dollars to the global economy. Most recent data from Europe gives account of around 4 million people injured at work resulting in more than three days of absence from work (Eurostat 2009).

2- Physical injuries at work place

A study showed that the physical injuries in industrial workers were ranging from moderate to serious in severity. Whereas the hands and the fingers were mostly damaged in these accidents. Injuries indicated that the fingers of the upper extremity accounted for highest number of accidents. The thumb, index and middle fingers of both left and right hand were maximally affected in accidents. The majority of accidents in case of lower extremity were on the foot, toe and then leg (Nag1998). The environmental noise exposure is linked with various adverse psychological and physiological health effects (WHO 2011). Working in places where the everyday doses of noise exposure go above 89 dB is additionally hazardous

for those who are suffering from mild noise induced hearing loss. Reducing the noise contact decreases the number of workers injured because unable to hear auditory cautionary signals. This should improve not only the general working conditions, but also reduce the risk of acquiring noise-induced hearing loss (Picard et al. 2008).

3- Seasonal influences on health of workers at work place

Seasons also have a strong influence. A number of questionnaire studies have found links between low relative humidity (RH 5–30%) and an increase of occurrence of dry air and the sensory irritation of the upper airways and eye. Further studies showed less complaint by an increase of relative humidity (Wolkoff2007). The associations are more dominant at room temperatures above 22°C and generally more common during the heating season (Mizoue et al. 2004). Several of the studies also indicate that a temperature increase, which could result in some decrease of relative humidity, increases the frequency of symptoms of eye-irritation (Mendell et al. 2002). Also high temperature could lead to desiccation of the workers eyes (Wolkoff et al. 2012). However, clear relations between the symptoms and thermal climate have not been found in a number of studies (Brauer et al. 2006; Marmot et al. 2006). Several factors may affect the conclusion, and the reason for this discrepancy is not clear.

4- Human factors and ergonomics at workplace

Some specific ergonomic problems also exist in most of the industries which includes training, awareness, motivation, and occupational health and safety programs with regard to management. Hand tools, machines, manual materials handling and workstations with regard to the work and workplace design. Upper-body and neck aches, discomfort, fatigue, backaches, wrist and hand pain, dissatisfaction and stress with regard to workforce and problems of noise, heat, humidity and dust with regard to the environment (Shikdar 2003). Hence the work environment exposes workers to many health hazards and contributes to respiratory diseases, injuries, musculoskeletal disorders, cancer, reproductive disorders, cardiovascular diseases, eye damage and hearing loss, mental and neurological illness as well as other communicable diseases (Kortum2005). Working conditions are very poor in hazardous industries, so the workers are affected most in those industries and face diseases like lung cancer, skin and eye allergies, deafness. So health and safety council must be set up by the government at national, provincial and plant levels to ensure that lives and health of workers are protected (Awan 2001).

5- Risk

A risk is a random event that may possibly occur and if it did occur, would have a negative impact on the organization goals (Vose 2008). In risks analyzing stage, assessing the likelihood or risk occurrence, identification of existing and new controls for minimizing the likelihood of risks and cost identification of this purpose can be observed. Risk analysis may be qualitative, semi- quantitative or quantitative. Past records, experiences, industrial practice, market research, experiments and judgment that techniques used in the risk analysis stage. (Sohail 2012). Four methods that includes in risk analysis which are hazard identification, risk assessment, determining the signification of a risk, communicating risk information.

Therefore, improving productivity of the workers and OHS is major concerns of industry especially the developing countries. Some common features of industries are inappropriate workplace design, ill-structured jobs, mismatch between job demands and workers abilities, unsuitable environment. Workplace hazard reduces the productivity of the workers and quality of work and product cost increases (Shikdar 2003). Promotion of Health is an important part of occupational health professionals. Health educators, safety officers, and physicians play role in workplace health promotion and should be trained accordingly.

6- Environmental and human health risk assessment

Environmental and human health risk assessment is the initial stage of Environmental management system. To improve the quality of life it is a necessity for industries to do careful assessment both before and during operation. After implementation to a scenario it was concluded that it can define the sources of the risk along with certain risk classes which support the decision makers to identify which risk source should be given priority. Also they can without difficulty point out and rank all the factors which are contributing in those risk sources. While developing management alternatives for on-going and unfounded, the environmental decision makers can utilize this approach for the industrial plants which are using hazardous materials (Topuz et al. 2011).

The occupational health specialist plays a very important role in maintaining the safety and health of employees by carefully assessing the work site for potential hazards that can cause serious harm and reducing or preventing the risk inflicted by them (Alli 2009). OHS includes all the factors which are related to the work including the working methods, nature of the work and the working environment that may cause injuries, diseases or other health impacts among the workers. It includes deafness from loud noise in the workplace, unsuitable work

environment, mechanical risk during the use of machinery, physical and mental strain from monotonous and heavy work, long working hours or very high speed, the physical and chemical hazards which includes intoxication from the irritating substances and inhaled fumes, dusts, vapors or gases, skin diseases which used in the workplace. Also having unfriendly or bad relationship among the staff members and workers contribute to unhealthy work environment with various nervous symptoms such as anxiety and depression. Another study presented a model of 3 groups of accident inhibition measures which includes structural conditions, behaviors and modification of attitudes. These three factors influence two types of the risk aspects, which are physical and environmental aspects of the organization and the behaviors of the staff and workers, and two more factors which include social norms, attitudes and cultural beliefs. The relation between structural modification, injuries and accidents, behavior, organizational environment and physical environment seemed strong. When various preventive measures are more effective when they are used in combination, these are more effective and useful than the interventions which only affect the individual beliefs and attitudes. There is a need to establish interventions that influence the safety aspects and the social norms of culture and to organize combinations of prevention (Lund 2004).

7- Situation of Occupational safety and health world wide

In Malaysia a study was directed to examine the awareness regarding health and safety among the staff members who are working in the higher learning institutions. The main objective was to study the connection between the organizational policies regarding safety at the workplace, environment of the office, attitudes of staff-members, and commitments by the management. The findings showed that there was a very significant co-relation among the analyzed and studied variables, which suggested that it is necessary for the management of the organization to set up and promote some safety codes in the organization (Ibrahim et al.2012).

In Thailand a study was carried out to present a general impression of the status of OSH Management in enterprises which are both medium and small (SMEs).The industries were medium having 100 to 299 workers and small having 20 to 99 workers. All over Thailand the response rate received from small industries was 22.4% and from medium size industries the response rate was 14.7%. Many enterprises take excellent care of the hygiene and health of their workers and thus have arranged numerous welfare facilities for this purpose. Maximum accident cases were reported from the production enterprise. For small and medium

enterprises the essential safety elements are safety inspection, investigation of accidents and the reports of accidents. In Thailand the SMEs had better management of health and safety either because by value their products were in the set of the 24 maximum exporting supplies or either they were forced by their customers (Kongtip et al. 2008). The small scale businesses are more likely to adopt very unreliable and non-formalized employment relations (Lamm 2003). The small scale firms display for the temporary or self-employed workers and may not be interested in proposing the safe working conditions to these workers (Guadalupe 2003). Insufficient representation of workers may undermine the effectiveness of workers' control on changes in working conditions and reduce the pressure on managers to commit to safety. Also these small firms usually show weaker workers representation in health and safety as compared to large scale mills/industries (Walters 2004).

Spain had the highest rates for non-fatal mishaps i.e. 7073 per 100,000 persons in occupation and the 3rd for fatal accidents i.e. 5.5 per 100,000 persons in service behind Ireland (5.9), and Portugal (7.7) in the year 1998 (Dupre' 2001). Spain has undergone a progressive transformation that has resulted in placing it in the most advanced group of the western economies. This was an important structural change, along with the movement to a private sector services from a highly agricultural country is a part of this revolution. Its present status has made it likely to evaluate the Spanish productive system to other European countries in a process of sustainable development. All the Spanish people get the security of health care and assurance of social services and the Institution of Social insurance is an example of social protection in Spain. These benefits help in covering illness, covering unemployment, ensuring family protection, and a pension system for public. Rates and the state are responsible for this financial support of social insurance institution (Sese' et al. 2002). Another study investigated the influence of the practices for risk prevention and the organizational factors which comprised of the safety measures, intensity of risk, risk prevention, quality management tools implementation, the enhancing the empowerment of the workers, and the usage of flexible technologies for production. The results showed that the emphasis upon the prevention activities, empowerment of workers, and the wise use of quality management tools are the factors which contribute to lessen the number of injuries. In contrast to all this higher accident rates were observed as a result of implementing flexible manufacturing processes (Arocena et al. 2008).

The similar kind of study was conducted in the textile industries of Ahmadabad, India. This has a primary dominance in textile industries. In which the numbers of accidents were

recorded with the help of questionnaire which included data about the organization, along with the date and time of accident, number of injured persons, the circumstances and the nature of injury, the body parts affected the most, the working conditions in the organization, and the general complaints regarding health. The study helped in identifying the causes of these accidents. The departments which are covered in this industry include boiler room, weaving, finishing process, and spinning, dyeing (Nag 1998). Assessments show that over 50% of industrial-based accidents occur due to poor training, poor management, and other psychological factors (Flemming 2002).

A major problem in Turkey and all over the world is the occupational accidents. As a result of these occupational incidents every year nearly one thousand people die and two thousand people are injured leading to temporary or permanent disability. As a result, this leads to social and economic problems for these people and their families suffer from occupational accidents socially and psychologically. Also the economy of the country suffers badly and the employers are encountered with economic loss and work day loss. In this study the results of occupational accidents which took place between the years 2000 to 2005 in Turkey were assessed. A falling trend was also seen in permanent disabilities since 2002. Occupational accidents are frequently observed in the textile industry, construction, coal mining and in the manufacture of transportation vehicles (Unsar 2009).

In Zimbabwe an ergonomic assessment was also conducted to identify the potential musculoskeletal risk factors. Hazards due to work postures, manual handling, and speed of work or hand tool use were identified in the various processes including bale breaking, waste pressing, and spinning, scouring and winding (Mtetwa 2003).

CONCLUSION

The present study explored the situation of occupational health and safety in large scale textile industries of Lahore along with the risk analysis. The study found that there were different issues, which create hurdle to achieve an effective OHS system in textile industry. At management level the occupational health and safety awareness was not very high and in spite of awareness the implementation of OHS services were not satisfactory. To carry out the responsibilities of health and safety there was not sufficient numbers of competent personals and the people who were employed for the job were not a specialist in the field of OHS. The available medical facilities on site were not satisfactory. The majority of the management did not recognize the significance of discussion to the workers at the policy making level. At the workers level they were not aware about the significance of

occupational health and safety. Chemical safety and physical hazards are frequently encountered in the industries. Furthermore the workers were not aware their legal rights. There was the shortage of technical facilities such as air checking and biological monitoring. The rate of the use of PPEs was low among workers.

Table 1.1

	Statements	Frequency	Percent	Cumulative Percent
Industry A	Fall	1	6.7	6.7
	Machine	4	26.7	33.3
	Environmental factor	4	26.7	60.0
	Overexertion	3	20.0	80.0
	No any	3	20.0	100.0
	Total	15	100.0	
	Industry B	Fall	1	6.7
Machine		7	46.7	53.3
Overexertion		1	6.7	60.0
No any		6	40.0	100.0
Total		15	100.0	

Table 1.2 affected parts of respondents

	Statements	Frequency	Percent	Cumulative Percent
Industry A	Hand fingers	8	53.3	53.3
	Palm	4	26.7	80.0
	Others	3	20.0	100.0
	Total	15	100.0	
	Industry B	Head	1	6.7
Foot		1	6.7	13.3
Hand fingers		10	66.7	80.0
Palm		3	20.0	100.0
Total		15	100.0	

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