

OCCUPATIONAL HEALTH AND SAFETY IN INDUSTRIES IN DEVELOPING WORLD

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ABSTRACT

Current global workforce stands at about 2.8 billion. Workers spend about one third of their lifetime at workplace. Workers expect safe working environment as their fundamental human right. However there are still poor working conditions especially in developing countries due to lack of practicing simple preventive measures. The standard of Occupational health and safety available at any work place is the main determinant of workers' health. Workers all over the world, face dual occupational hazards, the traditional as well as novel in the complex work settings due to rapid industrialization, technological advancement and globalization, over the last few years. An equally wide variety of chemical, physical and psychological hazards in production. Occupational health issues affect individuals, families and communities, as well as the citizens of the world. All the stake holders including the state, the manager, the employer and the worker have certain responsibilities to take up medical, engineering and legislative interventions to make work environment safer. This review study was conducted at Department of Community Medicine, Gomal Medical College, D.I.Khan from October 9, 2016 to November 30, 2016. Qualitative, secondary data was collected through literature search. MEDLINE (PubMed), Google scholar and Pakmedinet were searched out employing relevant keywords from 2000 onwards until January 2017. Data was organized, summarized, analyzed & interpreted. The objective of the study was to identify existing gaps on occupational health and safety in industries in developing countries and propose future research areas.

KEY WORDS: Occupational health; Health education; Hazard control; Personal protective equipment; Safety.

This article may be cited as: Ahmad I, Sattar A, Nawaz A. Occupational health and safety in industries in developing world. Gomal J Med Sci 2016;14:223-8.

INTRODUCTION

Current global workforce stands at about 2.8 billion. Workers spend about one third of their lifetime at workplace. Workers expect safe working environment as their fundamental human right. However there are still poor working conditions especially in developing countries. Workers all over the world, face dual occupational hazards, the traditional as well as novel in the complex work settings due to rapid industrialization, technological advancement and globalization, over the last few years. This is resulting into injuries, accidents, illnesses, disabilities and death. Occupational health issues affect individuals,

families and communities, as well as the citizens of the world, hence the need for occupational health. Occupational health and safety (OHS), is concerned with the safety, health, and welfare of the workers, family members, employers, customers, and other stakeholders. It studies all factors influencing the health of workers at their workplaces as well as at home, thereby anticipating, recognizing, evaluation and control of hazards. The standard of Occupational health and safety available at any work place is the main determinant of workers' health.¹

Generally workers' health is not focused in educational curricula and poorly represented in non-health policies due to low level of awareness among the policy makers including general public. The Global Plan of Action on Workers' Health (2008-2017) developed by World Health Organization (WHO) seeks to address all determinants of workers' health, disease and injury, social and individual factors, and access to health services.²

In 1950, a joint Committee of the International Labor Organization (ILO) and WHO defined OHS objectives as the Promotion and maintenance of the highest degree of physical, mental and social

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Date Submitted: 22-12-2016

Date Revised: 26-01-2017

Date Accepted: 24-02-2017

well-being of workers in all occupations; Prevention among workers of departures from health caused by their working conditions; Protection of workers in their employment from risks resulting from factors adverse to health; Placing and the maintenance of workers in an occupational environment adapted to their physical and mental needs.³

According to the ILO, 160 millions of workers suffer from occupational diseases, more than 270 million suffer from occupational injuries and about 2 million workers die prematurely every year from occupational illnesses such as respiratory, musculoskeletal, noise induced hearing loss (NIHL), occupational poisonings, skin, infections, silicosis, cancers and injuries. This amounts to 4% of annual global GDP⁴. More than 80 % burden of the worldwide workforce and occupational diseases/ injuries occurs in developing countries. this shows tip of the iceberg as under reporting in developing countries is common workers and their families suffer from pain and misery, economic and job losses. Employers confront loss of production, reduction in the quality of work and negative image of the organization.⁴

OHS is a field not fully established in developing countries. Majority of workforce does not have access to health services. Poverty, illiteracy, mushrooming growth of industries, lack of training, lack of reliable OSH data and inadequate implementation of existing legislation are some of the factors responsible. Huge workforce in unorganized sector, availability of cheap labor, meager public spending on health, shortage of OSH professionals, apathy of stakeholders and lack of integration of occupational health with primary health care are some other reasons.⁵

Occupational health and safety, by applying preventive medicine i.e. primary, secondary and tertiary prevention, in all occupations, is an international and most prior subject all over the world. Being a multi-disciplinary field, it employs different professions such as medicine, epidemiology, physiotherapy, rehabilitation, safety engineering, ergonomics, nursing and many others. The scope of OHS consists of occupational medicine, industrial hygiene and safety services and industrial welfare services. Research, record keeping, training of occupational health professionals, drafting legislation, providing support to occupational health services, surveillance of occupational diseases, developing standards and policy are the main functions of any national institute on OHS.⁶

Work environment consisting of a triad of environment, man and machine has associated risk factors or hazards, which are directly or indirectly operative, having the potential to harm the health, safety and welfare of workers. Occupational hazards may produce immediate or delayed symptoms depending upon duration of exposure, intensity of exposure

and individual susceptibility. Industrial workers are exposed to a multitude of hazards from physical, biological, mechanical, chemical, psycho-social and ergonomic issues which adversely affects workers, coworkers as well as the organization⁷. Majority of workers are illiterate and ignorant about the protective measures for the job.⁸

The effect of these hazards can be minimized by using the hazards control strategies by all the stake holders including the state, the manager, the employer and the worker have certain responsibilities to take up medical, engineering and legislative interventions to make work environment safer.⁸

Besides health, OHS also ensures increased productivity, higher quality of work, increased workforce morale, reduced employee turnover & over all quality of life are some of the benefits of OHS. Maslow's hierarchy of needs says that an individual at a workplace, prioritizes his physiological and safety needs to social, esteem and growth needs. OHS, therefore can be a strong motivator.⁹

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LITERATURE REVIEW

Occupational health and safety is a very old concept. Only criminals, prisoners & slaves were supposed to work in mining sector as ancient Egyptians & Greeks were aware of the associated health hazards. Ancient physicians considered it below their dignity to take care of workforce. Agricola & Paracelsus, Italian physicians of 16th century were the first to record miners' diseases. Bernardino Ramazzini (1633-1714), considered as father of OHS, was the first to write on occupational diseases and stressed the importance of taking occupational history of the patient. The industrial revolution in the 18th century in America and Europe the pressures of increasing production exposed the industrial workers to physical and emotional hazards associated with occupational diseases and social problems¹⁰.

Physical hazards

Physical hazards include surroundings of the workers such as heat, cold, loud noise, poor lighting, poor ventilation, vibration, electricity and radiations. Excessive heat from ovens & furnaces may lead to fatigue, prickly heat, cramps, syncope and heat

stroke. NIHL results from exposure to loud noise for longer periods. It is most common industrial health problem which may be difficult to identify as builds up slowly with time. Other non-auditory effects of noise include tinnitus, fatigue, nervousness & annoyance reducing human efficiency. Vibration from drilling, hammer & chisel may cause white fingers due to vascular spasm and musculoskeletal injuries. Corneal foreign bodies and welding arc keratitis is common if proper precautions are not observed. An electrical injury occurs when a current passes through the body, interfering with the function of an internal organ or sometimes burning tissue. Unsafe housing & polluted general environment aggravate the poor health of the worker further.¹¹

Chemical hazards

Chemical agents such as metals, disinfectants, solvents, tar, grease, oils, acids, alkalis and lime etc. cause contact dermatitis, eczema and burns on face and body. Inhalation of dusts, gases, metals and their compounds cause pneumoconiosis and asthma. Eating with contaminated hands may cause lead poisoning especially in children.¹²

Biological hazards

Biological hazards include influenza, insect bites, tuberculosis, malaria, dengue, diarrhea, cholera, typhoid fever, hepatitis A, parasitic diseases, fungal infections.¹³

Mechanical hazards

Mechanical hazards in the form of accidents & injuries commonly result from incidents such as being caught-in, struck by machinery, falling from height and manual handling of loads, slips, trips and falls, tools. Injuries, deaths & damage to the property due to electrocutions & short circuiting and fires resulting from combustible material poorly stocked are common in industries.¹⁴

Psycho-social hazards

Job insecurity, difficult working hours, poor work-life balance, constant pressure by top management for increased productivity, poor career opportunities, discrimination, lack of communication, and low pay result in workplace stress. Stress results in varied reactions among workers depending on age, sex, social support and different processing styles. Specific types of personalities such as type A individuals tend to experience more stress than type B. At individual level it manifests in two ways. Psycho-behaviorally it shows up as time pressure, hostility, aggression, anxiety, depression, decreased job satisfaction, insecurity, interpersonal conflicts, tension, alcohol, drug abuse, workplace violence, bullying and sleep disorders. Psycho-somatically it presents as headache, shoulder and neck pain, backache, migraine,

fatigue, peptic ulcer, hypertension, heart disease and rapid aging. Low performance & morale, high rates of accidents, high staff turnover & absenteeism are the symptoms of psycho-social stress at organizational level.¹⁵

Ergonomics

Ergonomics is the adjustment of man, machine and work environment. Ergonomics draws on a number of scientific disciplines, including physiology, biomechanics, psychology and anthropometry. The risk of musculo-skeletal disorders (MSDs) increases in manual handling of too heavy, too large and difficult to reach loads. Repetitive activities, prolonged standing often combined with a bent over or awkward position and sitting for long hours also result in MSDs. Cumulative-trauma-disorders (CTDs) are cumulatively received over time minor back injuries due to improper work postures. These have leg pain, tingling and numbness as an early sign and end up in disc rupture.¹⁶

Engineering measures

Engineering measures emphasize controlling a hazard at the source. Engineering measures include designing out hazards when new materials, equipment and work systems are being planned for the workplace, routine maintenance and house-keeping, general ventilation, mechanization, substitution, redesign or improved work processes, wet processes, total enclosure, isolation, dust suppression, local or general exhaust ventilation systems, job rotation, protective devices, environmental monitoring, statistical monitoring, research & training. Personal protective equipment (PPEs) are the devices that serve as barriers between a hazard and the worker. Disallowing exposure to noise equivalent of 85 dB by increasing distance, enclosure and using less vibrant & absorbent materials are important measures. The probable connection between noise and industrial accidents could be because of the masking of sound signals like warning shouts, sirens and machinery noise etc.

Water pollution and soil pollution add toxicity to agricultural products causing human nutritional problems. Fire prevention done through clearance of hazardous and combustible materials, exit lights, clear exits, smoke detectors, alarm systems, fire extinguishers and fire drills. Fencing of machines, uniform, device for emergency cutting off power, standardized lifts, lifting ropes & machines fully maintained, floors, stairs, passages with no pits, maximal limit of manual weight bearing, dangerous fumes, no portable light carrying in fumes, fire exits are some of the important issues. Toilets, kitchen, canteens must be clean. Impact of the occupational setting on the outside community including noise, smell and dusts may be reduced.¹⁷ The ergonomic design of

workplaces is of utmost importance. Adapting tasks, work stations, tools, and equipment to fit the worker can help reduce physical stress on a worker's body and eliminate many potentially serious, disabling work related MSDs. Ergonomic education and short breaks during work can address these.

Medical measures

Health assessment, which include pre-employment, pre-placement and periodic medical examination. Besides notification, supervision of working environment, medical surveillance, analysis of records, epidemiological research, toxicology for identification and evaluation of recognized & unrecognized hazards, and health education & counseling are also included.

Pre-placement examination enables to keep away the one eyed or epileptic workers from fast running machines & fire. Diseases like asthma, cancers, pneumoconiosis, contact dermatitis, NIHL and injuries may be notified, compensated as well as rehabilitated for prompt return to work¹⁰. Health and safety education and training should start as part of the induction course, following a transfer of employee to a new station, change in a working method and as refreshers, by using bulletin board, awareness seminars, workshops, Q&A session, videos, expert lecture, journals and books. Workers need to know not only how to do their jobs, but also how to protect their lives and health and those of their co-workers so as to recognize their legal, social and medical rights¹⁸.

Legislative measures

Legislative measures includes all those measures taken by the Government and administration for the health & safety of workers such as hazard allowances, overtime, shift duty allowances, interest free housing & vehicle loans, life and health insurance, transport, subsidizing cafeteria services, balanced diets, adequate running water for personal hygiene, educational facilities to children of employees, in service training and recreational facilities are also included.

After independence, the developing countries inherited policies and regulations of their former colonial masters which were revised as and when required in the course of time.

OHS policy must be reflected in legislation, and legislation must be enforced.¹⁴ International organizations have initiated various legislations for standardization and regulation of OSH. Different factory acts, child labor laws, leave with wages, occupational diseases, employment in hazardous processes and welfare of the employees fall under the purview of these measures. These include engineering controls and medical services. Different

types of enforcement activities by any agency to enforce compliance with OSH regulation consist of inspections and audits, warnings intended to change work practices, monetary penalties, prosecution and closure of the firm either temporary or permanent.¹⁹

Theoretical frame work

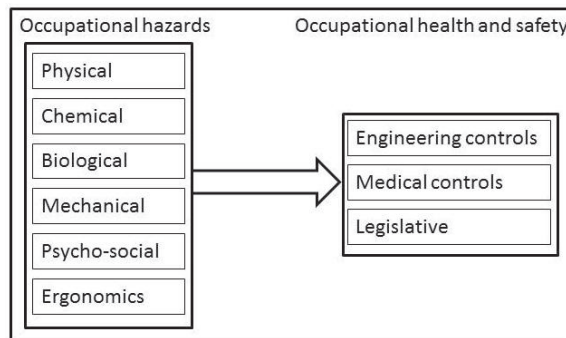


Figure 1: Graphical representation of the theoretical model of the OHS in industries in developing world.

DISCUSSION

High priority given to research and development of human resources & information system have improved workers health in the developed world. New occupational risks, such as ergonomic factors and job stress, as well as the traditional hazards are given attention simultaneously in the advanced countries. However, change for better have not been adequately achieved in developing countries due to poor economies, endemic diseases, malnutrition, poor environmental sanitation, lack of awareness, and inadequate medical care.²⁰ In developing world, most industries lack basic hygiene facilities, medical & first aid facilities, emergency transportation and hazardous warning signs. Most workers are not willing to use PPEs due to inconvenience and discomfort during the operations¹⁶ especially hot environments exposing workers to hazards. Poor knowledge and attitude of hazards, lack of supervisor influence, unattractive looking, and non-availability are other reasons of poor compliance. Unsafe working conditions, illnesses and injuries are not reported to management nor are these investigated²¹.

In developed world, the surveillance based on "prioritize inspections" have increased the quality of occupational health inspections to prevent occupational health problems.²³ Whereas the laws/regulations are neither comprehensive nor are these properly implemented as far as the developing world is concerned. Legislative Acts need updating as do not cover small enterprises, agriculture, informal, house-based, seasonal, construction & other unregulated sectors.²²

In Europe, workplace health promotion and risk management is an essential foundation for a

successful OHS program.²⁴ The systematic identification of hazards or risk factors at the workplace level is a crucial procedure to the risk identification, risk analysis and risk evaluation. Whereas issues for the developing countries are non-affordability, lack of infrastructure and sociocultural barriers in implementation of health strategies due to scarce resources.

In developed world stress-related, cardio-cerebrovascular diseases and musculo-skeletal disease and quality of life have become a major issue. Governments trying to improve OHS through regulation, enforcement, supporting academia and raising research funds.²⁵ Whereas In developing countries classical occupational diseases have been the main focus of research.

CONCLUSION

According to literature review, There is general lack of knowledge, attitude and behavior on the part of employees, employer and regulating bodies in developing countries. Occupational diseases and injuries are very common due to lack of adopting simple preventive measures.

It is recommended that all the stakeholders including the state, the employer and the worker need to adopt systematic approach of identification and assessment of the risk by collecting maximum information, implementing a solution to the risk followed by regular monitoring to determine if it has been lowered to from high to medium or from medium to low. Regular Workplace hazard inspections should be ensured.

Strong political will of the decision makers to enforce the existing legislation is crucial along with record keeping, reporting, notification and research. Employer is required to provide leadership for OSH activities by incorporating occupational health and safety into the institutional objectives and integration of safety policy into the quality management system. Attaining OSH knowledge, attitude and skills should be encouraged among employees. The involvement and meaningful participation of employees in implementation and maintenance of OHS services is fundamental to make it effective and acceptable.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.

AUTHORS' CONTRIBUTION

Conception and Design:	IA, AS, AN
Data collection, analysis & interpretation:	IA, AS, AN
Manuscript writing:	IA,