OCCUPATIONAL RISK ASSESSMENT AS A TOOL FOR MINIMIZING WORKPLACE ACCIDENTS IN NIGRIA INDUSTRIES

FASORANTI, AFOLABI JOSEPH

HUMAN KINETICS AND HEALTH EDUCATION, UNIVERSITY OF LAGOS, NIGERIA

E-mail address: fasorantiafolabi@yahoo.com

Phone no: 2348051735374

Abstract

The purpose of this study was to examine the role of occupational risk assessment as a tool for minimizing workplace accidents. Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations, the protection of workers in their employment from risks resulting from factors that have adverse effect on their health. This paper was discussed under the following headings; concepts and definition of workplace hazards and accidents, causes of accidents in the workplace, types of workplace accidents, occupational risk assessment as a tool for minimizing workplace accidents. Based on the findings the following recommendations were mad; workers should take reasonable care for their own safety and that of other persons who may be affected by their acts of omissions or commissions at work and also employers should carryout prompt and regular risk assessment programme in the working environment and also ensure that all identified risks and hazards are taken care off.

Keywords: Occupation, Risk Assessment, Workplace, Accident, Tool.

Introduction

The quest for means of livelihood, enhance earning power and survival has led to the involvement of individuals in different types of jobs, activities or work. These jobs or activities are referred to as occupations which is been carried out in a workplace. Anupama and Protibha, (2011) defined workplace as the environment or place in which a worker performs his job. Certain jobs pose a threat to the health of the worker and the community at large, such as driver embarking on long hours driving is at the risk of having

low back pains, also an employee working at asbestos factory is at the risk of contracting asbestosis. Health is the greatest asset of any human being and the community in general and it is the foundation on which the entire production of the people rest (Gray, 1990). As a result of industrial revolution worldwide, of which Nigeria is inclusive, man's mode of production has greatly shifted base from the use of physical forces prevalent at the primitive era to the manipulation of machine and gadgets. Regrettably, mechanization of production process has ushered in a multitude of health problems of industrial origin summarily referred to as workplace hazards (Nwachukwu, 2000).

Occupational Health and Safety Act (2006) defined workplace hazard as any condition that result from exposure to a workplace hazards such as physical, chemical or biological agent to the extent that the normal physiological mechanism of the body are affected and the health of the worker is impaired. Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations, the protection of workers in their employment from risks resulting from factors that have adverse effect on their health. Some occupational safety and health experts believe about 50 million Nigerians are at risk in the workplace (Adeolu, 2012).

Jacobson (2004) asserted that occupational risk assessment is the qualitative or quantitative estimation of the likelihood of adverse health effect that may result from exposure to specific health hazards. The author further stated that occupational risk assessment aims to provide a synthesis of exposure levels and health risks. National Institute for Occupational Health (2010) also defined occupational risk assessment as a careful examination of what could cause harm in the workplace, so that one can decide whether he has taken enough precaution or need to do more to prevent occupational illnesses. The International Institute of Risk and Safety Management (2010) reported that workplace hazard and fatalities occur daily in Nigeria. Olajeme (2010) further stated that scores of others are injured or permanently disabled. Adedayo (2014) reported that recently two uncompleted buildings collapsed in Onitsha within two weeks. The two incidents left about fifteen construction workers dead while many were injured, although after the collapse, Nigerian Society of Engineers vowed to investigate the events to forestall a recurrence, this did not prevent the second tragedy. Similarly, two warehouses, where flammable products were kept in Lagos were razed two weeks ago. It further reported that four employees working in a textile factory in Kano, were killed while trying to remove waste from the factory sewage treatment plant. Ajala (2010) also reported that three people were crushed to

death and causing several others injured by a train at Yaba, Lagos. Many more accidents of this nature, with impact on human lives and property, occur every day but only few are reported.

The International Labour Organisation has expressed concern over the apparent disregard for safety and health standards by Nigerian employers and workers. Adding that most of these accidents are preventable and deaths avoidable. Therefore, there is need to carryout risk assessment in every workplace so as to reduce or eradicate accidents occurrence.

Workers frequently find themselves being assessed by business leaders and politicians that health and workplace are being protected, that occupational health experts have assessed the risk and concluded that some product or activity was "safe" whether it is mad-cow disease, genetically-modified organisms, new chemicals, or drinking water, we are accustomed to being told that our worries are groundless (Esa, 2010). And in truth, that is what most of us want to believe, yet history has shown that humans are not all that good at assessing risks. Time after time the hazards of new technologies and products have been poorly understood at first, underestimated when the knowledge started to become available, and responded to too late. Tobacco, asbestos, vinyl chloride many pesticides even technologies such as automobile, electronic gadgets, safety ladders, safely belt, computers all were initially proclaimed "safe" and all were strongly defended even after information on their risks became impossible to ignore (Pablo, 2000). Thus, the focus of this paper is to discuss and examine occupational risk assessment in identifying and eliminating workplace hazards.

Therefore, occupational health risk assessment should be based on removing, and minimizing the causes of accidents and other events in the workplace which may have adverse effects on employees. It should be clear that this cause – and – effect relationship is not always easily identifiable and, as the process and activities in the workplace continue to develop, that the complexity of the problem is a continuing obstacle to good standard of health and safety. Therefore, risk assessment should be carried out within the organisation to identify and eliminate all obstacles to the proper functioning of the employees.

Concepts, Definition and Causes of Workplace Hazards and Accidents

Stephenson (2000) defined workplace hazards as a substance in a workplace which has the potential to cause harm or an accident. It is state of physical or chemical substances which have the potentials to injure a worker or impairments to his health.

An accident is an unplanned, uncontrolled event which may cause major or minor injury, diseases, damage, or other loss, such as delays incurring overtime costs. Many situations and actions can cause accident, and a combination of several factors often leads to accidents that end in serious injury. Those situations include, poorly designed structure of buildings, poorly designed, selected, constructed, guarded, or ill- maintained equipment, poor lighting and ventilation, lack of information, instruction, training and supervision, dangerous working practices, distractions and lack of attention, the use of alcohol and drugs, working while ill or tired, wearing unsuitable clothing, ignoring rules and regulations and not wearing the correct personal protective equipment (Valerie & David, 2006).

Factory Act (1948) defined workplace accidents as any occurrence in an industrial establishment causing bodily injury to a person which makes him unfit to resume his duties in the next 48 hours. It further stated that accident is an unexpected, unwanted event which cannot be anticipated in advance. It is always a sudden process and not a gradual one. The nature of workplace accidents may vary from one occupation to another such as; an employee being caught in a machine while working on it; falling from a sky scraper; accidents resulting from explosion from explosives. These accidents may result in disablement or death. Disablement whether partial or total, may take the form of a loss of ability to work or move. Such incapacity may be temporary or permanent. It is an established fact that accidents are caused, they do not just happen out of nothing. Whenever an accident occurs, there must be some cause, which maybe obvious, or difficult to trace. It has been reported that large number of factors combines to cause an accidents.

Types of Workplace Hazard

The National Examination Board in Occupational Safety and Health (NEBOSH,2006) classified workplace hazards into three categories which includes;

1. Chemical hazards
2. Physical hazards
3. Biological hazards

Chemical Hazard

McGinnis and Foege, (2011) asserted that chemical hazards represents ways in which toxic or poisonous substances enter the body, the symptoms of the exposure and what effects toxics they have in the short or long term. Chemical hazards occur inform of liquids, dusts, fumes, mists and gases. Prolonged exposure to these chemicals can result to chronic diseases of the respiratory tracts.

Biological hazard

This relate mainly to illness resulting from exposure to bacteria, viruses, fungi and other living micro or macro organisms. People who work in medical care and in agricultural industries such as farms, poultry are at high risk from all types of infection found in the environment. Exposure to these biological hazards can cause illnesses such as bird flu influenza, tuberculosis, measles, rabies, anthrax (AHA, 2000)

Physical hazards

This relate to harm caused to the body from mechanical, radiation or thermal sources or because of ergonomic conditions.

* Mechanical hazard are mainly concerned with vibrations, lightning, noise, temperature and other external pressures which can results in deafness, stroke, blindness e. t. c.
* Hazards from radiations are classified under two headings ionizing radiation, which includes alpha; beta-gamma-and-x-ray radiations.
* Thermal or heat energy are related mainly to the effect of sweating and losing large quantity of body salts which can lead to heat stroke, cramps.
* Ergonomic is concerned with the scientific study of people in their working environment. It relates mainly to the way in which people sit, stand and move in order to carry out the operations which are required for their jobs and the effects include such things as back pain or upper limb disorders.

How to Identify Workplace Hazard

Briggs, (1994) asserted that hazards have the potentials to cause harm. The further considered workplace hazards in all aspects, including the way in which the work is carried out and the way it is organized as well as the substances or equipment used, in order to assess what harm may arise. Klint and Curtis (2006) confirmed that some hazards and their associated potential harm are so obvious because they have an element of danger such as handling chemical substances may lead to exposure to chemical vapors or a spills resulting in external or internal burns or climbing up and down a ladder may result in falls. These scholars opined that in many other instance where hazards are less obvious, particularly where a normally safe operation may only become hazardous in particular situation such as defects in electrical equipment whereby handling such equipment may cause shocks or burns due to wiring problem or a change in circumstances such as spillages or misplaced boxes and equipment making walking across a floor hazardous.

Klints and Curtis (2006) stated that there are two major methods of identifying hazards these include;

- Nature of Work
- Incidental Data

Nature of Work

This process of identifying hazard is an active way in that we are trying to identify hazards before they are realized. The main ways of examining work are through inspections and by job/task analysis

Role of Inspections

Inspection relates to the examination of plant and equipment and the way in which they are used. It involves physically watching operations and testing equipment to see if they are any hazards or non-compliance with legislation, rules or safety procedures (Klints & Curtis, 2006).

Inspections are usually carried out on a regular basis, including test, of plant and equipment, to ensure that everything is working as it should be. This is likely to be done as a part of routine maintenance. In most cases, some form of checklist of key points will be used as the basis of a thorough and methodical approach. Keller (1998) opined that it is particularly important to establish what actually happens in the workplace or during the work activity, especially where it differs from the approved methods as set out in manuals. Here, inspection is possibly the only way of checking reality, rather than what employees may want others to believe about the way the work is carried out. All inspections should be properly documented, noting the hazards identified the precautions in place and any action which has been or should be taken.

Job/task analysis

Method study and work measurement are used to analyse a particular job with the purpose of improving efficiency. A job can also be analysed in a similar way with the emphasis on safety or hazards. The results can be used to correct existing analyses and to improve, among other things:

- Methods, instruction, protection, rules, emergency procedures,
- Reporting of hazards, provision of reformation
- Layout of work areas.

The process of job analysis should be carried out methodically through series of steps. The steps are as follows:

✓ Preliminary study of document

✓ Special safety of work

- ✓ Special safety aspects
- ✓ Interaction
- ✓ Validation

.**Incidental Data**

This is reactive because the hazards have already been identified by the fact that the risk they present has been realized. If the company has been in operation for some time there are likely to be records available of any incidents which have happened in the past. They provide source of information about hazards, but as they are historic, they should be checked to find out whether the hazards still exist and whether appropriate safety precautions have now been put in place. This emphasizes the value of keeping detailed records of all incidents data which may be used are:

- Maintenance and inspection records; which give details of problems with machinery and equipment.
- Accident records, which should provide information about the causes of accidents (note the distinction here with the classification of accidents by cause of injury, which is not so relevant to identifying hazards). Ideally, accident data will indicate people, jobs, work areas, time of the day and situation which require careful consideration.
- Ill-health data which deals with that data of sick people as a result of dusts, germs and other causal agents.

Occupational Risk Assessment

A common trend in legislation throughout the world is the concept of risk assessment. In some regions like European Union, African Union, Nigeria inclusive, there is an explicit legal requirement to conduct suitable and sufficient risk assessments. Even in regions where there is no explicit legal requirement to conduct suitable and sufficient risk assessments. Even in regions where there is no explicit reference, it is always impaired (Adeniyi, 2004). Implicit in any attempt to protect the health and safety of workers is the process of identification of hazard, and the people at risk, a broad assessment of the magnitude of that risk and some consideration of what action to reduce that risk. The nature of the assessment will depend on the relative complexity of the risks, the process involved, the number of personal exposed, the legal requirements and the current safety procedures.

National Institute of Occupational Health (NIOH, 2010) defined occupational risk assessment as a careful examination of what could cause harm to people, so that you can determine whether you have done enough

or should do more to prevent harm. Gastrus (2006) also defined occupational risk assessments as the process of evaluating the probability or likelihood of an injury occurring and the severity and consequences of the injury

Objectives of Occupational Risk Assessments

NIOH (2010) stated that the overall aim of a risk assessment is to ensure that no one suffers harms as a result of workplace activities. It further stated that the three main reasons for assessing and managing risk are:

Human Harm

The strongest reason for risk assessment at work place is to prevent harm occurring to people as a result of workplace activities. The workplace activities are inherently dangerous. However, no one expects to risk life and limbs or their physical or psychological health as a consequence of going to work. There is therefore, a moral duty on employers to take appropriate steps to ensure the health and safety of their employees. Risk assessment is the main means by which this can be effectively planned.

Legal Effects

Employers have legal obligation in relation to health and safety which, if they do not fulfill them, may give rise to severe penalties, including fines or imprisonment. A proper risk assessment may provide evidence that an employer has taken the correct steps to fulfill those obligations. The employees compensation act (2010) stated that employers must take full responsibility for the welfare, safety and health measures of all employees. According to the act, the employer is obligated to provide safety tools and appliances, safe working system and competent workers, in a bid to prevent health and safety hazards.

Economic Effects

Employers will want to minimize the often substantial financial costs of accidents in the workplace. The costs include not only the direct cost of damage to machinery and equipment, output, loss of orders, increased insurance premium, etc.

Steps of Occupational Risk Assessment

Although there are often no fixed rules about how a risk assessment should be undertaken, it is important to take a structured approach which will allow all relevant risks or hazards to be considered.

Health, Safety and Environment (HSE, 2OO4) categorized steps of occupational risk assessments in the workplace into five steps as stated as follows;

Step1: Identify the hazards

This is the process of identifying all the hazards that exist in the workplace. Employers and employee must be aware of all the possible hazards, but it is the significant ones that are important. The staffs actually performing the tasks are likely to be the best people to assess them, although the familiarity with the job may make them less objective about potential hazards. The hazard may be identified by a walk-through survey to identify the substance and materials in the workplace such as chemical used, machines e. t. c.

Step 2: Decide who might be harmed and how

This is the process of determining who may be at risk from the hazards, i.e the groups of staff and others likely to be affected in the case of an incident involving the hazard special attention should be given to an inexperienced staff, lone workers or temporary staff, and to the particular needs of disabled staff, pregnant women and children (Health and Safety Executives (HSE, 2001).

Step 3: Evaluate the risks and decide on precautions

This is where we assess the significance of the risks and suggest what should be done to protect people. Proper working systems and procedures should be put in place to check the likelihood of an accident.

Step 4: Record findings

The significant findings of the assessment should be recorded and kept. There should be records of all hazards, the risks that they present and what precaution are in place to protect people from harm. This written records is an important reference for future use, not only as the basis for reviewing risks, but also as information for enforcement officers, or even evidence in any court proceedings arising from an accident involving the risk (HSE, 2001).

Step 5: Review assessment

The way we work is constantly changing, perhaps as a result of new equipment or modifications of existing equipment, building alterations, new procedures, new or modified products, etc. It is important that we continue to be vigilant about hazard, and risks and review workplace conditions regularly. How often is "regularly" will depend on the extent of the risks and the degree of change (HSE, 2001).

Occupational Risk Assessment in Minimizing Workplace Accidents

Occupational risk assessment is the identification of hazards and evaluation of the risk which they pose. Here, the researcher will be concerned with the measures to be taken in eliminating or minimizing the risk having identified them.

Onwuama (2014) stated that there are numbers of general principles upon which the prevention of accidents and other incidents threatening the health and safety of workers and others is based which includes; pre-employment medical examination to ascertain the health status of the employee; staff amenities and conducive environments; preventive services such as ensuring that all workers comply with the usage of personal protective gadgets and company based clinic and hospitals. Hilbert (2014) supported her motion that there are different ways of eliminating or even avoiding workplace accidents. The following approaches were therefore postulated;

- Evaluating risks which cannot be avoided by carrying out risk assessment
- Controlling or extracting the hazards at source. E. g, providing a fume cupboard with extractions (Hilbert, 2014)
- Adapting work to the requirements of the individual e. g providing adjustable height tables or chairs to reduce muscle injuries.
- Setting up adequate health-surveillance programmes including pre-placement or regular health checks where appropriate
- Replacing a hazardous substance with less hazardous substance, e. g. replacing a flammable with a non- flammable substance
- Developing a coherent overall prevention policy such as provision of personal protective equipment, signs post to indicate hazards.
- Analyzing and investigating accidents and dangerous occurrences.
- Giving appropriate instructions to employees, including the use of signs, trainings and supervisions.
- Designing the workplace to reduce risk, e. g., providing guardrails around roof-mounted equipment or designated walkways and crossings points through areas with moving vehicles.
- Safeguarding machinery, e. g, providing interlocked guards that switch off the machine if someone tries to gain entry to dangerous part of it.

Conclusion

This paper examined the roles of occupational risk assessment in identifying and minimizing workplace accidents. Workplace hazards can be seen as part of workplace challenges that must be identified and solution must be proffered In order to promote safety and safe systems of work in an organization, all employers are required to carry out a symmetric and critical assessment of the risks in the work place, and the precautions put in place to protect people from harm. The occupational risk assessment should ensure that significant risks are identified and addressed.

Recommendations

Occupational risk assessment will help to prevent and minimize workplace accidents if the following recommendations are given prompt consideration in every organsiation;

* Workers should take reasonable care for their own safety and that of other persons who may be affected by their acts of omissions or commissions at work
* Employers should carryout prompt and regular risk assessment programme in the working environment and also ensure that all identified risks and hazards are taken care off
* All staff should be well educated on the risk involved in a particular area of the industry and also comply with instructions given for their own safety and health.
* Employees should report forthwith to their immediate supervisor any situation which they have reason to believe could present a hazard and which they cannot correct themselves.

Contributions to Knowledge

1. This paper prompts employers to carry out risk assessment. In their working place as it unveils the importance of risk assessment in identifying and minimizing workplace accidents.

2. It has provided information which enables employers and employees to gain a deeper understanding of risk assessment and ways in which safe systems of work will eliminate or minimize workplace accidents.

References

Abraham, I.L. & Krowchuk, H.V. (1986). Unemployment and health: Health promotion for the jobless male. *Nursing Clinics of North America, 21(1), 37-47*

Adedayo, I. (2014). Lack of safety policy causes workplace hazards. In the Punch Newspaper on 18th June, 2014.

Adeolu, E. (2012). Occupational accidents and causes in Nigeria. *Journal on Occupational Health and Safety Practices, 56(12), 342-354.*

Achalu, E.I. (2000). Occupational Health and Safety. Lagos: Simard Nigeria Limited Splendid Publishers.

Adeniyi, J.A. (2004). Occupational Health: A fundamental approach. Haytee Organizations 46 (5).

American Heart Associations. (2000). Heart and stroke statistical update. Dallas: Author.

Anupama, P. & Protibha, B. (2011). Industrial safety and environment. New Delhi: Arora

Asuzu, M. (1994). Occupational Health: A summary, introductions and outline of principles, Ibadan, Afrika Link Book.

Brain, C.Y. (1956). The composite Risk Management Process. McGraw-Hill Publishers: New York.

Briggs, L.O. (1994). Prevalence of injuries among metal factory workers. *Social Science and Medicine, 14(7), 76-89*

Bureau of Labor Statistics, (2006). National census of fatal occupational injuries, 2006. Washington, DC: Author

Center for Diseases Control. (2006). Fatal occupational injuries: United States, 1996-2006. *Morbidity and Mortality Weekly Report, 47(15), 46-52.*

Cook, R. (2008). Simplifying the creation and use of the risk matrix. London, Springer.

Cox, L. A. (2008). What's wrong with Risk Matrices? Risk Analysis: *An International Journal 28(2), 497-512*

Deubenspeek, A.W. (1974). Occupational Health hazard. Hicksville New York: L exposition press

Esa, N. (2010). Environmental knowledge, attitude and practices of student's teachers. *International Research in Geographical and Environmental Education 19(1) 39-50*

Gastrus, J. T. (2006). Effective occupational health practices. Dublin: Walter publishers.

Gray, J.E. (1990). Planning health promotion at the worksite Benchmark press, Indianapolis, U.S.A

Health and Safety Environment, (2004). Workplace hazards: Evaluation and implication for control. Thousand Oaks, CA: Siege.

Health and Safety Executive (2001). Reducing risks, protecting people: HSE's decision-making process. Norwich: Health and Safety Executive.

Hewett, C., P. Quinn, et al. (2004). Towards a nutrient export risk matrix approach to managing agricultural pollution at source. *Hydrology and earth system sciences, 8(4): 834-845.*

Hilbert, O.L (2014). The benefits of risk assessment. *New England Journal of Medicine.324 (34).*

Jacobson, B.A. (2004). Occupational risk factors. Impact and implication for pretention *International Journal on Risk Management 7(4): 46-58*

Keller, F. (1998). Public concerns over workplace hazard. *Public Understanding of* Science 6(4): 219-237.

Klints, S.O. & Curtis, B.J. (2006) Occupational Health Assessment. *Risk analysis 16(3): 302-326.*

Kraus, J.F., Franti, C.E. & Bahraini, N.O (1995). Incidence of traumatic spinal cord lesions. *Journal of Chronic Diseases, 28, 471-478.*

Marten, O.F. (1992) Workplace Safety and Practice. Herefordshire, Garden City Press Ltd. McGinnis, J.M., & Foege, W.H. (1993). Actual cause of death in the United States. Journal of the American Medical Associations, 270(18), 2207-2212.

National Examination Board in Occupational Safety and Health, (2006) Management of International Health and Safety. Retrieved from www.nebosh.net/thr.nt//jkl.nt on 31/April/2014

National Institute of Occupational Health, (2010). Occupational health and safety manuals. Retrieved from http//.nioh.net.illnet/nmmh. On 10/05/2014.

National Institute of Risk and Safety Management, (2010). International review of disaster management. New York: Haworth Press

Nwachukwu, A. E. (2000). Industrial and occupation health and safety, Owerri: Totan Publishers Ltd.

Olajeme, A.N. (2010). Risk management and analysis in the workplace. Enugu: Harper & Row

Onwuama, M. (2014). Occupational health and safety: In Otinwa, G.O, Safety education. Lagos: Kogbon prints and communication, pg 106-132.

Pablo, A. (2000). Accident proneness and prevention, Harvard Publications

Papadakis, G. A. & A. A. Chalkidou (2008). The exposure–damage approach in the quantification of occupational risk in workplaces involving dangerous substances. *Occupational Safety and Risk at ESREL 2006 46(6), 972-99*

Smith, E. D., Siefert, W. T. & Drain, D., (2008). Risk matrix input data bases. *Systems Engineering 1-1.*

Standards Australia (2004). HB436:2004 Handbook: Risk Management Guidelines: Companion to AS/NZS4360:2004. Sydney, Standards Australia.