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# Work Impacts on Health: Their Implications and Management Techniques

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## Abstract

Adverse conditions in workplaces that impact negatively on the health of workers are legion. They include Biological, Chemical, Electrical and Mechanical Hazards; as well as Physical Hazards like noise; particulate emissions; thermal stress; poor illumination; pressure and vibration, among others. These have a couple of fundamental implications. Several exposed workers suffer accidental injuries, occupational diseases, deformity or death. Management suffers lost-work-time occasioned by absence of incapacitated workers; as well as avoidable financial losses through medical expenses, occasional litigations instituted by families of industrial accident victims, and through the payment of required compensations. Further implications are that the above conditions make it mandatory that management must protect their employees from the consequences of these Occupational Health Hazards (OHH) by running a comprehensive Occupational Health Services (OHS) programme in their establishments. The degree of effectiveness of such services rests principally on the flawless adherence of both employers and employees to all industrial legislations that deal with the protection of the health, safety and welfare of workers.

## Keywords

Ergonomic-Stress-Vectors (ESV) - Monitoring  
 Threshold-Limit-Values (TLVs) - Fixed Guards

## Introduction

Governments, individuals, or corporate bodies set up small, medium or large scale industries to provide goods and services for consumers of their products. The degree of productivity of workers engaged in these industries depends, among other things, on their respective levels of health. Their health status, in turn, is to a large extent influenced by the adverse conditions in the work environment under which they operate. Such negative conditions are generally referred to as Occupational Health Hazards (OHH), or Ergonomic Stress Vectors.

In this paper, the writer has discussed the topic: "WORK IMPACT ON HEALTH, AND ITS IMPLICATIONS" from the following perspectives.

1. The Identification of Occupational Health Hazards (OHHs), their sources and effects on health.
  - a. **Biological Hazards:** These are living organisms like bacteria, virus, insects, etc capable of causing health problems to workers. Their sources include insanitary work places, contaminated substances, culturing of pathogens for vaccine-production, and bushland where workers may be exposed to them. Effects of Biological hazards include skin diseases like ringworm, foot-rot and dandruff, as well as internal physiological disorder/sickness.
  - b. **Emotional/Psychological Hazards:** These arise from strained inter-personal relationships, especially between employers and employees; delayed, or denied promotion, poor salaries/wages, and other work-related problems. Effects are low morale, absent-mindedness, poor work performance, and possibly accident proneness (Nwachukwu, 2000).
  - c. **Chemical Hazards:** These exist in solid, liquid or gaseous forms, and enter the body through the mouth, skin or nostrils. Sources include petro-chemical industries and all jobs involving exposure to chemicals. They may cause skin corrosion, dermatitis, asphyxiation, if inhaled; or food poisoning, if ingested (Adedipe, 2002).
  - d. **Electrical Hazards:** Arise from live and uninsulated electrical conductors, and may cause either shock, or electrocution, if body contact is made with them.
  - e. **Mechanical Hazards:** Sources are moving parts of machines like chains, sprockets, blades, revolving shafts, saw, as well as wrong body postures during activities involving lifting, lowering, pushing or pulling of

heavy objects. Negative health impacts are different types of injuries, like fractures, cuts, incised, lacerated or punctured wounds, etc.

**f. Physical Hazards:** these comprise:

- (i) **Thermal Stress:** excessive heat arises from furnaces, kilns, ovens and the sun, among other sources; causing excessive loss of water and salt through perspiration; as well as Heat Camp, Heat Stroke and Heat Exhaustion. Excessive cold, on the other hand, arises from cold rooms; refrigerating plants and very cold weather; causing vasoconstriction, pneumonia, goose-flesh, or frost bite.
- (ii) **Noise Hazard:** This could be “IMPACT noise” which is very loud and of very short duration; or low, steady-state-noise which lasts for a long time. Examples of sources include explosions and running machines, respectively; resulting in partial or permanent deafness to exposed workers.
- (iii) **Radiation hazards:** emanates from radioactive materials, or particles; and from ionizing radiation. Gene-mutation, deformity, still-birth, tumour/cancer are their possible consequences on workmen exposed to them.
- (iv) **Particulate Hazards:** Like dusts of asbestos, silica, cotton, bagasse, smoke or vapour may cause respiratory problems such as cough, pneumoconiosis, labored breathing, asphyxiation or death. Victims are workers involved in the production, or use of the above substances.
- (v) **Hazardous Illumination:** Illumination in a work place can be hazardous if it is either too bright, or too dull, for the retina of the eyes. While excessively bright light produced by welding operations, for example, may bleach the photosensitive cells of the retinae; dull light in other work places cause eye-strain. Both cases may lead to partial, or permanent visual impairment.

**Implications**

The implications of accidental injuries/illnesses which workers suffer from, as a result of exposure to Occupational Health Hazards are many. Hospitalization of affected workers will lead to:

- Loss of man-hours and loss of production on the part of the workers concerned;
- The industry may pay high medical bills;
- If victims of adverse work conditions take management to court, to seek redress, cost of litigations, and possible financial compensations may be high.
- The aggregate consequences of all of the above may be a reduction in the net financial profit made by a company; and a possible loss of reputation in health and safety matters, before the public.

These make it imperative that industrial managements must put up counter measures to control occupational health hazards, to ensure the health and safety of their employees (Chukwu-igwe, 2000).

This is where Occupational Health Services (OHS) come in (Nwachukwu, 1995; 2000).

**2. Control/Interventionary Measures**

These are embarked upon through the following processes:

**Step 1: Hazard Identification**

Although different types of occupational health hazards exist, they do not occur in the SAME Occupation at the same levels of magnitude. So, we must first IDENTIFY the SPECIFIC type(s) of hazards that have the **greatest** impact on the health of workers in EACH workplace. This gives us a definite focus in deciding on the best control measure to apply against such major hazards.

**Step II: Hazard Evaluation**

The specific hazard(s) identified in each occupation should now be evaluated to know if their exposure levels are above, or below legally and internationally accepted Occupational Exposure Levels (OEL), or Threshold Limit Values (TLVs). Such data tell us if the degree of health damage which exposed workers may suffer from will be minor, major, complicated or terminal. Commensurate control measures will then be applied, to protect the workers.

**Step III: Hazard Control**

Hazard identification and evaluation processes are followed up with hazard control measures; from the “general” and “specific” dimensions.

**A) General Control Measures**

- i. **At Source:** It is best to control a health hazard at its point of origin. Noise, from friction between two dry metallic surfaces in a machine, for example, could be controlled at source by 'lubrication'.
- ii. **Along the Transmission-Line:** this involves controlling a hazard that has already left its source before it gets to a worker. For instance, electrical current passing through a conductor, and may cause shock, or electrocution to a worker could be prevented from doing so by INSULATING the electrical conductor; or stopping current-flow altogether with the use of a CIRCUIT-BREAKER such as a 'fuse-wire', a 'switch', or a 'thermostat'.
- iii. **At the Point of Effect:** Health hazards which could not be stopped or controlled at either their sources or lines of Transmission can be prevented from causing harm at its 'point-of-effect' (the worker) by providing such workers with appropriate 'Personal Protective Equipment (PPE) against the hazards' (Ezewu, 2003).

## B. Specific Control Measures

Any identified health hazard could be controlled at its source, line-of-transmission or point of effect by adopting any of the under-listed specific control measures in any of the three areas, stated above:

- i. **Total Elimination:** The adverse health effects of a particular hazardous substance/process can be prevented by stopping the use of such a substance/process **completely** in the workplace. Example; 'Helon gas' is a very effective fire-extinguisher. However, its contribution to the depletion of the protective ozone layer has caused it to be eliminated from the list of legally accepted fire extinguishing agents.
- ii. **Substitution:** This control measure involves replacing a highly hazardous substance/work process with less hazardous ones, and at the same time achieving the target objective. Petrol, for example, is a chemical solvent which could be used in washing greasy engines/machines. But, because petrol is highly flammable, kerosene, which is a less flammable chemical solvent could be used as a substitute for petrol in washing off the grease/oil; to prevent fire outbreak.
- iii. **Engineering Control:** This could be achieved through the total enclosure of a hazardous substance or work process. Processes involving the emission of radioactive particles, for instance, are usually carried out inside a totally enclosed chamber. The operator observes the process through a glass window, impregnated with lead. This prevents a worker from being exposed to radiation, because lead absorbs radioactive particles.

The partial enclosure method of hazard control is also called the BARRIER system. It prevents workers from coming in contact with health hazards by creating an obstacle/screen between the hazard and a worker. Machine Guards, for example, are fitted to machines to cover moving parts like chains, blades or shafts, to stop them from causing injuries to workers.

Furthermore, Robots are other engineering devices used to carry out highly hazardous jobs like car-spraying in mega automobile factories; to protect workers from exposure to chemical fumes (Ridley, 1999 and Nwacukwu, 2000).

- iv. **Administrative Control:** Administrative approaches to hazard control in the workplace are back-up strategies to be applied, in conjunction with the elimination, substitution and engineering control systems. The key aspect of administrative control measures which are virtually legislative in character, are explained below:
  - **Safe and Healthy work site/location:** The site for an industry should be well-drained. Water-logged areas offer breeding grounds for Biological hazards like insect-vectors of disease organisms; such as mosquitoes and tse-tse flies which spread malaria and sleeping sickness respectively. Wet grounds also make some workplaces damp and humid. These conditions are adverse to health.
  - **Work Buildings:** These should be solid and spacious enough, to permit free movements of men and materials, without collision, and possible injuries. They should be well-ventilated; have adequate illumination; smoke/fire detectors; fire-alarm systems; emergency exit doors; fire-extinguishers; non-slippery floors; and good noise-control, among other things, (Oluwagbemi, 2004).
  - **Medical Examinations:** There should be: '**pre-employment**' medical examinations for prospective employees to know their health status, and avoid conditions that may worsen their health; '**periodic**' medical examinations, to discover workers who may have started suffering from the impacts of health hazards, as well as '**pre-placement**' medical examinations for workers returning from a long period of

- hospitalization or annual leave. This is to know whether they are medically fit enough to go back to their former work places; be transferred to safer worker-units, or be retired, on medical grounds.
- **Health and Safety Education/Training:** Employees should be informed about the health hazards in their jobs, the negative impacts of such hazards, and the protective measures against them (Onuzulike, 2003). Training enables workers acquire the right skills and avoid errors that may precipitate accidental injuries.
  - **Protective Equipment:** All moving parts of machines should be covered with FIXED GUARDS; and workers should be provided with personal protective equipment (PPE) to protect them from health hazards in their specific jobs (Eric; Van & Bates, 2001).
  - **Safety Supervision:** This is very important, to enforce both the use of protective equipment; and the strict adherence of workers to all safety rules and regulations. Defaulting workers should be gently corrected, and not harshly reprimanded, to avoid causing them emotional depression that may introduce accident – proneness (Galahan, 2006).
  - **Surveillance (Monitoring):** Three types exist: “Biological Monitoring” compares pre-employment and periodic medical examination results of workers. Any deviation from good health is discovered and treated early. “Epidemiological Monitoring” shows the types and frequency of health problems suffered by workers because of the health hazards in industry; and “Environmental Monitoring” evaluates the levels of identified health hazards; to know when they are above acceptable “Threshold-Limit-Values” (TLV) and apply needed control measures (ACGIH, 1999).
  - **Sanitation:** Hygiene standard in workplace must be very high (Adeosun, 1998). It prevents the spread of pathogens. Portable water and sanitary conveniences are effective in preventing communicable diseases which may cause sickness-induced absenteeism and loss of production from hospitalized workers (Uwalaka, 2009). Potable water is also required for washing of the body and workclothes; for canteen services and for production. Also, cloak rooms should be provided for keeping work outfit after each work day. Finally, all industrial wastes must be hygienically disposed of, to prevent air, land or water pollution (Olejoba, 2009).
  - **Rest and Recreation:** Protracted work periods cause fatigue and loss of concentration, leading to possible accidental injuries, and diminished output. Provision of periods for rest and recreation, therefore frees workers from physical and mental stress, and helps them regain lost energy for higher productivity.
  - **First Aid and Curative Health care:** Two fundamental aspects of medicine are preventive and curative Healthcare. Much of the discussions above centre on preventive healthcare. Yet, some workers may suffer from accidental injuries, or illnesses. They must be offered first-aid and medical services through the establishment of industrial hospitals, Retainership System of Healthcare, Group Occupational Health Services (GOHs) or General Hospitals.

### Summary and Conclusion

Work conditions of all descriptions exert a variety of negative impacts on the health of workers exposed to them. The consequences of such situations may be grave for both employers and employees of the companies concerned; but appropriate interventional measures, through relevant occupational health management systems, can eliminate, or minimize them.

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