

Occupational Health Hazards Among Workers in a Printing Press, Cairo, Egypt

Thesis

*Submitted for partial fulfilment of master degree
in occupational medicine*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

لَسْبَحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

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List of abbreviations

eg.	Example
<i>ACGIH</i>	<i>American Conference of Governmental Industrial Hygienists</i>
<i>CDC</i>	<i>Centre for disease control</i>
<i>COSHH</i>	<i>Control of Substances Hazardous to Health CNS: central nervous system</i>
<i>CTP</i>	<i>Computer to plate</i>
<i>FE</i>	Fisher Exact test
<i>HSE</i>	<i>Health and Safety Executive</i>
<i>IARC</i>	<i>International Agency for Research on Cancer</i>
<i>MSDS</i>	<i>material safety data sheets</i>
<i>NIOSH</i>	<i>National Institute of Occupational Safety and Health</i>
<i>OSHA</i>	<i>Occupational Safety and Health Administration</i>
<i>OHS</i>	<i>Occupational health and safety</i>
<i>PELs</i>	<i>Permissible exposure limits</i>
<i>SPSS</i>	<i>Statistical package for the social sciences</i>
<i>TLV</i>	<i>threshold limit value</i>
<i>TWA</i>	<i>time weighed average</i>
<i>VOC</i>	<i>volatile organic compounds</i>
<i>WHO</i>	<i>World health organization</i>
<i>WRMSD</i>	<i>Work related musculoskeletal disorder</i>
<i>X²</i>	<i>Chi Square test</i>

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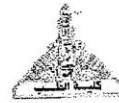
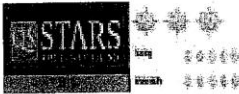
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Abstract

Background: Working in printing industry is full of potential risks and hazards that can be mitigated through proper occupational health and safety practices or adoption of safety precautionary measures and use of personal protective equipments among workers. **Objective:** The present study aimed to compare the health status of the printing workers with that of administrative department employees, to identify the awareness of workers in the printing press about different exposures, to identify the types of health hazards that the workers are exposed to, to describe the conformance of the printing press environment regarding certain safety standards & to deliver a concise health education message to printing workers regarding workplace health hazards. **Subjects & Methods:** A comparative cross- sectional study was conducted among printing workers and employees of administrative department during the period from September 2017 to August 2018; (171) printing worker and (175) administrative department employees were interviewed using structured questionnaire adopted from Employee health questionnaire (2010) including socio-demographic characteristics, awareness of the workers regarding hazardous occupational exposures, symptoms of various system affection and frequency of PPEs use. Assessment of the work environment using checklist modified from that of occupational safety team, 2012. A health education message was given to the participating workers about the importance of the PPEs and some first aid measures through a brochure designed by the researcher. **Results:** The current study showed that (73.1%) of the printing workers stated that their job may expose them to hazardous factors & (50.9%) of them stated that this was because of hazardous chemicals exposure and (24.6%) due to noise. Regarding the symptoms reported by the workers; there was significant difference between both groups regarding eye irritation, inability to hear, tinnitus, backache, leg pain, chest symptoms & skin allergic & irritating symptoms. By examining the work environment; there was excessive noisy machines, frequent chemical use & lack of ergonomics. **Conclusion & recommendation:** The study concluded that protective measures among printing workers are inadequate. The study highlights the importance of effective safety education and training of the workers. Also periodic medical examination for hearing & chest affection. And periodic environmental monitoring.

Keywords: printing press, safety practices, safety measures, health hazards, noise, Personal protective equipment.



The checklist about environmental hazard assessment was adopted from a checklist issued by the *occupational safety team, 2012*; necessary modification was carried out on the checklist to adapt it for use in the studied printing press.

C. Health education message:

In the form of booklet which includes different health hazards that the workers are exposed to. The message will be tailored according to each worker in different departments and health hazards they are exposed to.

• Ethical Considerations

- 1) Administrative Approval: Permissions for study conduction will be obtained from the printing press Board of Directors Chairman.
- 2) Ethical committee board approval will be obtained.
- 3) Verbal informed consent will be obtained from study participants before completion of questionnaire. The confidentiality of the data obtained will be assured

• Data management:

The collected data will be revised for accuracy and completeness, then coded and entered to personal computer to be analyzed using IBM SPSS version 20.0

Differences will be considered significant at p-value less ≤ 0.05

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3. METHODOLOGY:

- **Type of Study:** Comparative Cross Sectional study.

- **Study Setting:** A printing press in one of the most reputable Egyptian newspaper. The study will be carried in one of the most reputable & important newspaper in Egypt that publish huge amount of copies every day. The newspaper is located in Cairo's city centre. This printing press is not only famous for publishing newspaper but also for school & university books. The printing press employs about **200** workers that are dedicated for printing newspapers & books & binding of school & university books.

- **Study Period:** six months starting from November to May 2017.

- **Study Population:**

Printing workers in the studied printing press who are exposed to printing hazards.
Administrative department employees who are not exposed to printing hazards.

- **Sampling Method:**

All workers in the printing press (200 workers) and Administrative department employees (about 250 workers) who agree to participate in the study. A response rate will be calculated;

$$\text{Response rate} = \frac{\text{number of study units interviewed}}{\text{Total number of study units}}$$

- **Study Tools**

A-Interview questionnaire will be used to collect data from participating workers in the printing press. The questionnaire includes the following sections:

Section I: sociodemographic characteristics of the participating worker (age, gender, occupation, years of experience, number of working hours per day, education, marital status & special habits of medical importance).

Section II: awareness about different exposures that can affect worker's health.

Section III: assessment of the worker's health through asking about various symptoms of different systems.

e.g. special senses, central nervous system, motor system, respiratory system, dermatological symptoms, digestive system, urinary system & tumors)

Section IV: compliance of the worker to safety & security standards through the use of personal protective equipments e.g. gloves, goggles, ear plugs & masks)

The questionnaire was adopted from *Health Management Toolkit, 2010*, Employee health questionnaire.

B-Checklist about the environmental hazards

Assessing General Work Environment, Housekeeping, Floor, Means of exit, Personal protective devices, Employee facilities, Fire Protection, Electrical safety, Manual Handling, First Aid, Waste Handling & Storage
Different exposures that can affect worker's health;

-Physical hazards e.g. noise, radiation, vibration & electricity.

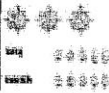
-Mechanical hazards e.g. lifting heavy objects, pulling, pushing, awkward position, repetitive movement & accidents.

-Chemical hazards e.g. dust, solvents, inks, toxic gases, metals like lead & mercury, acids & alkali.

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occupational safety and health (*Global plan of action on workers' health, 2007*).

Many workers are unaware of the potential hazards in their work environment, which makes them more vulnerable to injury. (*occupational safety & health administration OSHA, 2017*)

All employments include varying degrees of hazards. The lack of awareness in the printing industry allows for exploitative conditions. It is important that workers are made aware of the dangers of such exposures. Regulation of adequate protection and safe working conditions are essential for the health of the workers. (*Koodam, 2016*)

Potential risks and hazards can be mitigated through proper occupational health and safety practices or adoption of safety precautionary measures and use of personal protective equipments among workers (*Salamatu & Ibrahim, 2015*)

Because occupational hazards arise at the workplace, it is the responsibility of employers to ensure that the working environment is safe and healthy. This means that they must prevent, and protect workers from, occupational risks. (*Alli, 2001*).

Employers should provide good working medium to the employees. Anyhow occupational health and safety is provided with laws and regulations. But because of lack of audits, uninterest of employers, laws can't be enforced. (*Özman, 2008*)

There are numerous studies on occupational accidents and diseases that occur in printing-publishing sector on the world. However it isn't possible to adequately rely on this information even in most developed countries. As the content of these studies don't provide adequate relations between exposure to occupational health accidents, diseases, risks & environmental safety conditions.

The current study will not only assess the workers' health and their working environment but also the researcher will give a health education message to the participating workers to raise their awareness about the health hazards that they are exposed to and hence to protect themselves. The researcher will also find the most important health hazards in the work environment which would help to recommend actions to printing press manager to modify the work environment and provide logistics to improve workers compliance to safety & security.

2. AIM/ OBJECTIVES.

Goal

To prevent occupational health hazards among workers in printing press.

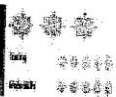
Objectives

- 1- To compare the health status of the printing workers with that of administrative department employees.
- 2- To identify the awareness of workers in the printing press about different exposures.
- 3- To identify the types of health hazards that the workers are exposed to.
- 4- To describe the conformance of the printing press environment regarding certain safety standards.
- 5- To deliver a concise health education message to printing workers regarding workplace health hazards.

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**What is already known on this subject? AND
What does this study add?**

Printing workers are exposed to various risks in their workplace that negatively could affect their health status, performance & quality of life, and hence the present study will be a step to assess the occupational health hazards and adherence to safety measures among workers in a printing press, in addition to describe environmental safety measures at the workplace. In addition, the researcher will offer a health educational message to workers at the studied printing press in an attempt to decrease occupational health hazards at their workplace & hence improve or prevent further deterioration in their health status.

1. INTRODUCTION/ REVIEW

Hazards are an inherent property of a substance, agent, source of energy or situation that has the potential of causing undesirable consequences while risk is the probability that damage to 'life, health, and or the environment' may occur from a hazard. In this regard, occupational hazards refer to workplace activities that have the potential to cause/increase the risk of injury or ill health (*Occupational Health and Safety Policy and Guidelines, 2010; Ford, 2010; Tziaferi, 2011*). Occupational safety is the control of hazards in the work place to achieve an acceptable level of risk, while workplace safety generally refers to the process of protecting the health and safety of staff while on the job, irrespective of vocation (*Tziaferi, 2011; Oluwagbemi, 2011*).

Globally, there are 2.9 billion workers who are exposed to hazardous risks at their work places (*Meswani, 2008*). An estimated 2.34 million deaths each year attributable to work-related accidents and diseases. Of these, the vast majority -an estimated 2.02 million- die from a wide range of work-related diseases. Of the estimated 6,300 work-related deaths that occur every day, 5,500 are caused by various types of work related diseases. The ILO also estimates that 160 million cases of non-fatal work-related diseases occur annually. (*International Labor Office (ILO). 2011*). Studies and estimates by many countries and the ILO have shown that economic costs of work-related illness and injury due to direct and indirect costs of occupational accidents and diseases (e.g. lost working time, workers' compensation, the interruption of production and medical expenses), would be equivalent to a range from 1.8%–6% of Gross Domestic Product (GDP) (US\$2.8 trillion). (*Jukka Takala et al, 2014*)

The factors affecting the health of printing workers are physical, chemical, ergonomic & psychosocial. According to several studies and statistics, the main risk factors of printing and publishing sector are; manual handling works, noisy machines, falling, being hit by object, hazardous chemicals, non-ergonomic working environment and stress (*Leiter et al, 2009*)

Despite the huge evolution that occurs in printing and publishing sector in the last decade, printing workers are still exposed to various hazards such as usage of hazardous chemicals e.g. alcohols, solvents & ink chemicals etc. (*Tez, 2008*).

However, the importance of occupational health and safety practice is often overlooked. This is because, the level of occupational Health and safety in Africa is low compared with the rest of the world (*Aliyu & Shehu, 2006*). According to available literature, risk factors leading to injuries are present in every occupation and among all occupations with industrial and agricultural workers having the highest risks (*Kaliyaperumal, 2004*). Governments in developing countries have apathy to occupational health and safety issues, and all the stakeholders, ranging from the management, workers and government do not appreciate the problems that can be solved or mitigated through



**PROTOCOL OF A THESIS FOR PARTIAL FULFILMENT OF MASTER
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