

UNIVERSITI TEKNOLOGI MARA

**THE HEALTH IMPACTS OF METAL DUST
EXPOSURE ON THE PERFORMANCE OF
RESPIRATORY HEALTH STEEL
FACTORY WORKERS**

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Project submitted in fulfilment of the requirements for the
degree of
Bachelor in Environmental Health and Safety (Hons.)

Faculty of Health Sciences

DECLARATION BY STUDENT

Project entitled “The Health Impacts of Metal Dust Exposure on Steel Factory Workers” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Dr. Abdul Mujid bin Abdullah. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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In the name of Allah, The Most Gracious, The Most Merciful.

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ABSTRACT

Background Information: Steel workers were exposed to various heavy metals dust that may have detrimental effects to respiratory health such as inorganic dust and toxic gaseous. Workers may also have risk of suffering respiratory symptoms and chronic diseases including cancer, asthma, pneumoconiosis and COPD. The purpose of this study was to determine impacts of metal dust exposure to the performance of respiratory health among steel workers. **Methodology:** A cross-sectional study was conducted on 59 workers at Melewar Steel Tube Sdn. Bhd. Air sampling pump was placed at participant's breathing zone to determine the concentration of heavy metals particles exposed to the participants. The Atomic Absorption Spectrophotometer (AAS) was used to measure the concentration of heavy metals (Fe, Ni, Pb and Zn) in the particulate matter. The lung performance of the participants was measured using peak flow meter. **Results:** The highest concentration of heavy metals particles exposed to participants was Iron (Fe) and followed by Lead (Pb), Nickel (Ni) and Zinc (Zn). The highest prevalence range of lung performance was 400-499 PEFR meanwhile the lowest prevalence range was more than 600 PEFR. The prevalence rate of respiratory symptoms was chronic cough (28.8%), chronic phlegm (42.4%), chest tightness (37.3%) and shortness of breath (6.8%). There were significant relationships between concentration of Iron (Fe), Nickel (Ni) and Lead (Pb) particles and phlegm on most days for as much as 3 months and concentration of Nickel (Ni) and Zinc (Zn) particles and phlegm in morning, with the p-value < 0.05. There was a significant relationship between Zn particles and lung performance of the participants with the p-value of 0.04. **Conclusion:** Most of the heavy metals particles are exceed the Permissible Exposure Limit (PEL) standard in USECHH Regulation, 2000. Therefore, installation of local exhaust ventilation and Personal Protective Equipment (PPE) are recommended.

Keywords: *heavy metal, dust, particulate matter, respiratory health, steel industry.*