Junior Science Communications
Faculty of Applied Sciences, UiTM Shah Alam
https://journal.uitm.edu.my/ojs/index.php/JSC

E-ISSN 2637-0689
Vol 67 2026

Colloquium on Applied Sciences 1 2026
19-22 January 2026, Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

Evaluation of Workplace of Chemical Hazards and Risk Levels: A Case Study of Research Workplace Organization Studies

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Structured Abstract

Background: Chemical exposure in industrial workplaces remains a significant occupational health concern due to its potential to cause both acute and chronic adverse health effects if hazards are not adequately identified and controlled. Workers may be exposed to chemicals hazardous to health through inhalation, dermal contact, or accidental ingestion during routine operations. In Malaysia, the Chemical Health Risk Assessment (CHRA) is a mandatory requirement under the Use and Standards of Exposure of Chemicals Hazardous to Health (USECHH) Regulations 2000 to ensure effective identification, evaluation, and control of chemical risks. This study aims to conduct CHRA of two industrial work environments to evaluate differences in chemical hazards, exposure characteristics, risk levels, and the adequacy of existing control measures, thereby providing insight into how workplace context influences chemical health risk management effectiveness.

Methods: The Department of Occupational Safety and Health's (DOSH) Manual of Recommended Practice on CHRA (Third Edition) was followed when conducting the assessment. Workers were categorised into Similar Exposure Groups (SEGs), chemicals hazardous to health were systematically identified, and potential exposure routes, such as ingestion, dermal, and inhalation pathways, were assessed. Overall chemical health risk levels were determined through qualitative risk assessment using exposure and hazard ratings. Workplace walkthrough surveys, examination of chemical registers and Safety Data Sheets (SDS), interviews with staff, and assessment of current engineering, administrative, and personal protective equipment (PPE) control measures were among the techniques used to collect data.

Results: The results showed that the two industrial work environments differed significantly in terms of the kinds and amounts of chemicals used, exposure patterns, risk levels assigned, and the efficacy of controls put in place. Chemical health risks ranging from medium to high were found in a number of work units. The main causes of these risks were improper or irregular use of personal protective equipment (PPE), restricted or non-existent engineering controls, and unsafe work practices. The overall risk levels between the two workplaces were greatly impacted by differences in control implementation and compliance.

Conclusion: The results revealed that the two industrial work environments were significantly different with regard to the type and amount of chemicals used, risk levels assigned, and efficacy of controls implemented. Chemical health risks of medium to high levels were identified in several work units. The main factors contributing to the chemical health risks were found to be improper or irregular use of PPE equipment, lack of engineering controls, and unsafe work practices.
Keywords: Chemical Health Risk Assessment, Occupational Chemical Exposure, USECHH, Industrial Workplace, Risk Control Measures.

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