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RECOMMENDATIONS FOR THE HANDLING OF FLUORESCENT LAMPS IN PUBLIC SCHOOLS IN JOHANNESBURG, SOUTH AFRICA



ENVIRONMENT AND HEALTH RESEARCH UNIT

South African Medical Research Council

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INTRODUCTION

- Mercury has toxicological, physical & chemical or persistence properties, which may have acute or chronic detrimental impacts on human health & the environment.
- Fluorescent lamps, because of their mercury content, are regarded as hazardous waste and fall under the category of electrical waste.
- The use of fluorescent lamps is increasing world-wide, along with concerns relating to their mercury content and the associated hazards (Lombard and Webb, 2008).
- Despite the hazards associated with fluorescent lamps, their use is increasing international due to their energy-saving properties.



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INTRODUCTION CONT.

- Reclite (2008) states that millions of spent lamps country-wide, which contain mercury, are disposed of in municipal dumps every year. Since most of these lamps are commingled with general waste, breakages are inevitable.
- This practice results in mercury being released into the environment.
- The general public is not well-informed regarding the hazards of mercury-containing lamps and what to do in the event that a lamp breaks (Reclite, 2008).
- Currently such products are not regulated in terms of domestic disposal, some industries are not disposing of them at hazardous landfill sites, and the transportation of fluorescent lamps is not regulated, and neither is the crushing or disposal of lamps (Reclite, 2008).



PROBLEM STATEMENT

- Employees & learners at schools may be exposed to elemental or inorganic mercury through inhalation of ambient air in classrooms when fluorescent lamps are broken, or when fluorescent lamps are being handled, stored or disposed of improperly in schools, leading to the release of mercury into the environment.



AIMS & OBJECTIVES

Aim

- The aim was to determine the availability of guidelines on fluorescent lamps management in selected public schools within Johannesburg Metropolitan Area.

Objectives

- To identify the available guidelines (formal or informal) regarding fluorescent lamps management in selected public schools.
- To assess the effectiveness of the available guidelines regarding fluorescent lamps management in selected public schools.
- To recommend the fluorescent lamps management guidelines for operational procedures to the Department of Education.



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METHODOLOGY

- This was an exploratory study, conducted to gain insight on knowledge, practices and handling of mercury lamps in public schools in Johannesburg.
- Data were collected through the administration of structured questionnaires.
- School principals were the targeted respondents due to their role and responsibility with regard to implementation of guidelines and policies.
- Data were also collected through the completion of a checklist by the researcher.



METHODOLOGY CONT.

- The data collection tools were tested prior to the study.
- A pilot study was conducted beforehand at 3 public schools, that were not part of the main study sample.



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METHODOLOGY CONT.

- The sample population included public schools from within and around the Johannesburg suburbs of Hillbrow, Bertrams, Riverlea, Braamfischerville and Hospital Hill.
- Proportionate purposive sampling was used to select 22 out of 38 public schools in the selected neighbourhoods.
- A clear explanation of the purpose of the study, and assurance that they could withdraw at any time, was given to respondents prior to obtaining their consent. The privacy of the persons concerned and the confidentiality of their personal information were respected.



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RESULTS

EXISTENCE OF GUIDELINES IN SELECTED PUBLIC SCHOOLS FOR FLUORESCENT LAMP MANAGEMENT (N = 22)

	Formal (written) guidelines	Informal (not written down) guidelines only	Not sure	None
Existence of fluorescent lamp guidelines with respect to:				
Storage before use	0	4 (18%)	4 (18%)	14 (64%)
Replacement of spent lamps	0	3 (14%)	2 (9%)	17 (77%)
Cleaning of spillages (broken lamps)	0	2 (9%)	2 (9%)	18 (82%)
Storage after use	0	2 (9%)	2 (9%)	18 (82%)
Disposal	0	3 (14%)	2 (9%)	17 (77%)



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IMPROPER STORAGE & DISPOSAL OF MERCURY-CONTAINING LAMPS AT SCHOOLS



STORAGE OF FLUORESCENT LAMPS IN PUBLIC SCHOOLS



DISPOSAL OF FLUORESCENT LAMPS IN PUBLIC SCHOOLS





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DISCUSSION

- There appear to be no official recommendations on fluorescent lamp management in Gauteng public schools. Instead, a general policy on risks in schools makes brief reference to light bulbs.
- In countries such as the USA, the hazard of mercury in schools has been seriously considered and dealt with by the Environmental Protection Agency (EPA,2013).
- Childhood exposures to elemental mercury often results from inappropriate handling or clean-up of spilled mercury, so primary prevention measures such as health education and policy initiatives are important (Middleton et al., 2009).
- Acute exposure to mercury vapour (>0.1 mg mercury/m³) is associated with respiratory effects such as cough, dyspnoea and chest tightness as well as bronchitis and bronchiolitis with interstitial pneumonitis, airway obstruction and decreased pulmonary function (WHO, 2009)



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CONCLUSION.

- The findings of the study indicate the potential for employees, learners and the environment to be exposed to elementary mercury during the management of fluorescent lamps at selected public schools within the Johannesburg Metropolitan Area.
- This was due to the improper management of fluorescent lamps, especially from the replacement of spent lamps to final disposal.
- The findings revealed a need for formal guidelines and a model for operational procedures in fluorescent lamp management at school level.
- These operational procedures include the safekeeping of spent lamps until they are taken to a collection point for recycling or safe disposal in a hazardous landfill site or a recycling facility.
- The findings of this study are potentially generalizable to reflect the situation in public schools in Johannesburg or elsewhere in the country.



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RECOMMENDATIONS.

We recommend that the departments of Education, Health and Environmental Affairs, together with relevant non-governmental organisations, urgently draft a fluorescent lamp management policy for South African schools, and that appropriate education, awareness and monitoring programmes be undertaken to ensure proper implementation to protect the school environment and the health of South African school staff and children.



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