

**A STUDY ON THE PERSONAL PROTECTIVE
EQUIPMENT (PPE) USED IN OCCUPATIONAL
RADIATION PROTECTION**

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.



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SUPERVISOR'S CERTIFICATION

I declared that I read this thesis and in my point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honors.



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ABSTRACT

The use of personal protective equipment is compulsory as a personal protection and control measure from radiation hazard. The hazard can be a high exposure of primary radiation or could be a low dose of the scattered radiation from the patients' body. Therefore, the workers must wear proper and the best quality of PPE to mitigate the radiation harmful. There are a lot of PPE available in the market with a particular based material, such as lead aprons, latex gloves, thyroid shield, and glasses. All these PPE have their property in terms of design, radiation characteristic, based-materials and others. Therefore, this study is conducted to gather information and findings from the previous study as a systematic review. A case study was also conducted to identify awareness among radiation workers toward the hazard. As a result, 82 articles were retrieved from seven databases and screened out their eligibility. Of these, only 18 articles were eligible and included. Three of them discussed on theoretical such as survey and ten discussed on experimentally study. For the case study, a total of 81 respondents took part in the survey with 29 designed questions. Of these, only 14 questions were selected to discuss further. It can be said that the lead-based provide maximum protection to the workers. This agreement is supported with 86.4% respondents agreed (and strongly agreed) that the lead able to shield and protect workers adequately. Moreover, 74 % respondents agreed the lead is the best material for PPE. Anyhow, more than 6 % disagreed on it. This might be due to 88.9 % agreed that an ideal design of PPE is it must have no ergonomic problems. This agreement was significance with the review, where the lead PPE is about 1-7 kg in weighing with a minimum thickness of 0.25 mm. However, lead-based material is found to be dangerous to health because of its toxicity and the dust particles that formed on the surfaces of lead objects. Therefore, futher study is needed to identify lead equivalent material to overcome the lacking on the lead-based.