

Abstract

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Enhancing First Responder Safety in Nuclear Radiological Emergencies: A Systematic Literature Review of Personal Protective Equipment (PPE) Training to Promote Self-Efficacy Among First Responders

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Abstract

Objective: Nuclear radiological emergencies are classified as low frequency, but high impact events. Radiophobia and fear of deleterious outcomes often evokes hesitancy among responders. This review explored PPE use as a protective mechanism for responders' safety and identified tools that promote PPE efficacy among first responders during nuclear radiological events.

Methods: A systematic literature review was conducted using five scientific databases. More than 5,500 articles were screened to identify literature relating to "PPE use" by first responders during "nuclear radiological events".

Results: Regulatory agencies such as the IAEA and the NRC assert that PPE, (when worn correctly and consistently) minimizes radiation exposure. Adequate training of first responders emerged as a critical determinant to support appropriate PPE selection and usage during radiological emergencies. This included new employee trainings and refresher courses for existing employees. Pedagogical tools highlighted in the literature included tabletop exercises, safety huddles, trial runs for donning and doffing of new gear (with emphasis on air-fed suits), just-in-time training and virtual reality simulations.

Conclusions: Education on the effective use of PPE is essential to promote self-efficacy among medical staff and other first responders during nuclear radiological events. Comprehensive training will reduce unintended exposures, decrease hesitancy, and maximize employee safety.

Supplementary material. The supplementary material for this article can be found at <http://doi.org/10.1017/dmp.2024.230>.