

# Factors Influencing Nurses' Use of Hazardous Drug Safe Handling Precautions

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**PROBLEM IDENTIFICATION:** Nurses taking measures regarding the safe handling of hazardous drugs (HDs) can reduce their risk of exposure and environmental contamination. However, the findings of studies examining factors influencing the use of HD safe handling precautions by nurses have been inconsistent.

**LITERATURE SEARCH:** An integrative review of the Embase® and Scopus® electronic databases was performed.

**DATA EVALUATION:** The search strategy yielded 907 articles. Ten quantitative studies and two qualitative studies met the inclusion criteria. The Health Evidence Bulletin Wales checklist was used to evaluate the quality of the articles.

**SYNTHESIS:** The outcome variables were categorized as engineering controls, work practice controls, and personal protective equipment (PPE) use. The frequency of PPE use was measured as an outcome variable in all reviewed studies. Associated factors were based on the behavioral-diagnostic model. Perceived barriers to PPE use, perceived safety climate, and workload were common factors related to the use of safety precautions.

**IMPLICATIONS FOR PRACTICE:** Nurses should proactively obtain information about the safe handling of HDs and share their perceptions and experiences of it with their colleagues. Managers should actively construct a safe environment by adopting high reliability principles and provide nurses with sufficient and easy-to-use PPE.

**KEYWORDS** integrative review; safe handling; hazardous drugs; personal protective equipment

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The National Institute for Occupational Safety and Health ([NIOSH], 2004) defines hazardous drugs (HDs) as inherently toxic drugs posing a risk to healthcare providers. They are characterized as having carcinogenicity, teratogenicity, reproductive toxicity, genotoxicity, and organ toxicity at low doses. Nurses comprise the largest proportion of healthcare providers who make contact with HDs during multiple types of clinical activities (Connor & McDiarmid, 2006). Because acceptable doses of occupational exposure to HDs have not yet been determined, current recommendations suggest that nurses take measures for the safe handling of HDs to reduce exposure to risk and environmental contamination as much as possible (Eisenberg, 2018).

The Oncology Nursing Society's *Chemotherapy and Biotherapy Guidelines and Recommendations for Practice* (Polovich, Olsen, & LeFebvre, 2014) establishes protective measures for nurses exposed to HDs during clinical activities, with reference to guidelines by NIOSH (2004) and the American Society of Health System Pharmacists (2006). The measures outlined by Polovich et al. (2014) are based on a five-level, pyramid-shaped Hierarchy of Controls that can be followed by administrators and nurses. The top level of the pyramid involves reducing drug toxicity to control the risk from exposure, but this is generally not feasible in clinical practice. The remaining levels in the pyramid are similarly ranked, from most effective to least effective, according to how effective they are at controlling exposure: engineering controls, administrative controls, work practice controls, and personal protective equipment (PPE). Engineering controls reduce exposure through the use of equipment like biologic safety cabinets when preparing HDs and closed-system transfer devices when preparing and administering HDs. Administrative controls consist of policies and procedures for safe HD handling put in place by hospital management, regular updates to HD lists, education and training, medical surveillance,