Randomized Controlled Trial of an Intervention to Improve Nurses' Hazardous Drug Handling

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OBJECTIVES: To evaluate whether a web-based educational intervention improved personal protective equipment (PPE) use among oncology nurses who handle hazardous drugs.

SAMPLE & SETTING: From 2015 to 2017, the authors partnered with 12 ambulatory oncology settings in the United States to enroll 396 nurses, 257 of whom completed baseline and primary endpoint surveys.

METHODS & VARIABLES: In a cluster randomized controlled trial, 136 nurses in control settings received a one-hour educational module on PPE use with quarterly reminders, and 121 nurses in treatment settings received the control intervention plus tailored messages to address perceived barriers and quarterly data gathered on hazardous drug spills across all study settings. The primary outcome was nurse-reported PPE use.

RESULTS: Control and intervention sites had suboptimal PPE use before and after the intervention. No significant differences were observed in PPE use knowledge or perceived barriers. Participants reported high satisfaction with the study experience.

IMPLICATIONS FOR NURSING: Hazardous drug exposure confers notable health risks to healthcare workers. To improve hazardous drug handling, occupational healthcare workers, health systems, and professional organizations should consider coordinated efforts to implement policy and practice changes.

KEYWORDS hazardous drugs; personal protective equipment; occupational exposure

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For more than 40 years, healthcare workers have administered drugs known to be hazardous to human health (Connor & McDiarmid, 2006). Antineoplastic drugs, principally used to treat cancer, comprise the largest group of drugs classified by the National Institute for Occupational Safety and Health ([NIOSH], 2016) as hazardous. People who handle hazardous drugs in their routine work report higher rates of adverse reproductive effects (Lawson et al., 2012), rare cancers (NIOSH, 2017), and an array of ill-defined respiratory and skin ailments (Couch & West, 2012; West & Beaucham, 2014). Studies that establish either a causal relationship between exposure and health effects or a dose-response relationship are missing. NIOSH (2004), in addition to other provider organizations, such as the American Society of Health-System Pharmacists (2006) and Oncology Nursing Society (Polovich & Olsen, 2018), have published recommendations to reduce hazardous drug exposures, including the consistent use of personal protective equipment (PPE) when handling hazardous drugs. Despite this evidence, workers continue to report exposure, and documented adherence to risk-reduction actions remains suboptimal. In a multistate survey of oncology nurses, 17% reported unintentional exposure to a hazardous drug in the prior year (Friese, Himes-Ferris, Frasier, McCullagh, & Griggs, 2012). Oncology nurses, who administer the majority of these drugs, report persistently low adoption of PPE use to minimize potential exposure (Polovich & Clark, 2012). Few interventions designed to increase PPE use have undergone systematic study (Crickman, 2017; Keat, Sooaid, Yun, & Sriraman, 2013). To date, no published intervention studies have adopted a randomized controlled trial design.

Evidence exists that, when provided with data collected in oncology nurses' own practice settings,