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PhD Dissertation Defense

Entitled

**Exposure and Handling Practices of Healthcare Professionals for
Cytotoxic Drugs in the Workplace Environment**

by

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Abstract

Occupational exposure to cytotoxic drugs is associated with various unfavorable health

outcomes. There is currently no safe level for occupational exposure to cytotoxic agents. Healthcare workers' adherence to cytotoxics control measures is of primary importance to minimize the risk from exposure to these agents.

Aims: To develop a protocol for a systematic review and meta-analysis on environmental assessment of cytotoxic drugs in healthcare settings and conduct an environmental assessment study of cytotoxic drugs in two Oncology centers of Abu Dhabi, United Arab Emirates (UAE). In addition to evaluate pharmacists' and nurses' knowledge, attitudes, and practices (KAP) towards handling of cytotoxic drugs.

Method: This research project comprised of three studies. The first study developed a protocol on environmental assessment of cytotoxic drugs in healthcare settings. The protocol was developed in line with PRISMA-P guidelines. The second study evaluated workplace contamination with 10 cytotoxic drugs by collecting 79 surface wipe samples from preparation and administration areas of two Abu Dhabi Oncology centers. The third study was a cross-sectional survey using an online self-administrated questionnaire to assess pharmacists' and nurses' knowledge, attitudes, and practices (KAP) regarding the handling of cytotoxic drugs.

Results: In the first study, the protocol was registered (ID CRD42020162780) on The International Prospective Register of Systematic Reviews (PROSPERO). In the second study, a total of 79 surface samples were analyzed. Of these, 20 samples (25%) were positive for cytotoxic drugs residues. Moreover, 10 samples (13%) indicated contamination by more than one cytotoxic drug, mainly in the oncology pharmacy department in both hospitals. The levels of contamination in the positive samples ranged from 0.003 to 50 ng/cm². In the third study, 113 oncology healthcare professionals participated in the survey (23 Male and 90 Female). Most of them were aware of the potential hazards associated with handling of cytotoxic medications. The mean score of the participants' knowledge was 74 out of 100. The majority of the participants reported high adherence levels to the use of personal protective equipment such as gloves, protective gown, and mask (98.14%, 97.22.0%, and 96.29%), respectively, while handling these agents. All the participants (100%) had received training on the safe handling of cytotoxic drugs during the past year.

Significant contributions: The findings of this research provide important baseline data about exposure and handling practices of healthcare professionals for cytotoxic drugs in the workplace environment. The findings may be used to develop programs about cytotoxic drugs

handling that will help to minimize the risk of these agents. The results also point out that it is vital to healthcare facilities to assess environmental contamination with cytotoxics. Such initiatives will contribute to raise both knowledge and practices of healthcare professionals regarding the handling of cytotoxic drugs.

Gap filled: The environmental assessment study is the first study in the Middle East and North Africa (MENA) region, and in UAE in particular, that evaluated the potential environmental contamination with ten cytotoxic drugs in preparation and administration areas. Furthermore, the KAP study is also the first in the UAE to assess oncology healthcare professionals' knowledge, attitudes, and practices towards handling of cytotoxic drugs.

Keywords: Cytotoxic drugs, environmental assessment, occupational exposure, knowledge, attitudes, practices.