Handling Chemotherapy Drug Hazards Among Adult at Home

Thesis

Submitted for Partial Fulfillment for Requirements of Master Degree in Community Health Nursing

By

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2018

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Acknowledgments

First and forever, thanks to ***Allah,*** *Almighty for giving me the strength and faith to complete my thesis and for everything else.*

I would like to express my deepest gratitude and appreciation to ***Prof. Dr/ Seham Guirguis Ragheb,*** *Professor of Community Health Nursing, Faculty of Nursing, Ain Shams University, for her generous support and guidance to help me to put this work in its best form and for being an ideal model of a professor to follow. It was indeed an honor to work under her supervision.*

It is my pleasure to express my unlimited gratitude and deepest thanks to ***Dr. Wafaa Khalil Ibrahim,*** *Lecturer of Community Health Nursing, Faculty of Nursing, Ain Shams University, for her kind assistance, faithful supervision, precious help, valuable advice and guidance she offered me to complete this study. No words of gratitude can equal her help and support.*

I feel greatly indebted to all my family without their great effort, encouragement, help and support this work could not become.

Special thanks to all caregivers and their patients who participated in this study wishing for all good health and welfare.

Finally I would like to thank my professors, my colleges, all nurses and everyone who directly or indirectly helped me to accomplish this study.

Gamal Mohamed Mohamed Hussein

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List of Abbreviations

Abbr.	Full-term
AAPCC	: American Association of Poison Control Centers'
Ads	: Antineoplastic Drugs
BSCs	: Biological Safety Cabinets
CSF	: Cerebrospinal Fluid
DNA	: Deoxyribonucleic Acid
HDs	: Hazardous Drugs
HCWs	: Health Care Workers
HGB	: Hemoglobin
ISMP	: Institute For Safe Medication Practices
IM	: Intra Muscular
IT	: Intra Theca
WHO	**:**World Health Organization
NCAT	: National Cancer Action Team
NANDA	: North American Nursing Diagnosis Association
NCRPE	:National Cancer Registry Program of Egypt
NCI	Ntional cancer institute.
NIOSH	National Institute for Occupational Safety and Health
NPDS	National Poison Data System
PO	Per Oral
PPE	Personal Protective Equipment
PLT	Platelet
SHPA	Society of Hospital Pharmacist of Australia

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Abstract

Background: exposure to chemotherapy drug hazards is associated with adverse outcomes, safe handling precautions are recommended to reduce or eliminate exposure to hazards for patients. ***Aim:*** This study aim was to aassess handling chemotherapy drugs hazards among adult at home. ***Research design*:** Descriptive analytical design was utilized in this study. ***Setting:*** This study was conducted at the outpatient clinics at EL- Minia Oncology Center. ***Sample***: Purposive sample of total patient who received chemotherapy drugs among adult at home. ***Tools*:** :Structured interviewing questionnaire was used included **part I(A)** Socio-demographic characteristics, **(B)** Adult patient's medical history assessment, **part II** Adult's knowledges . **Part III** Adult's practices regarding handling of chemotherapy drugs Hazards among adult, and **part IV** Adult's health status from head to toes. ***Results:*** Reveals that the majorities of patient of study sample have unsatisfactory level of knowledges and practices regarding handling of chemotherapy at home, also, It was observed that 61.9% of adults having unsatisfactory knowledge level aged above 50 years, 52.4 % of them have illiteracy, and 90.5% of them have insufficient income / monthly with statistically significance differences. In additional there were no statistical significance differences between total practices regarding handling of chemotherapy drugs hazards among adult at home with personal data except education level which P – value ≤ .038.***Conclusion****:* The majority of patient of study sample have unsatisfactory level of knowledge and practice regarding handling of chemotherapy at home, also have abnormal sleep pattern and more than half of them have dry skin and abnormal skeletal system. ***Recommendation:*** The patient, family, and caregiver should be instructed on safe practices with administration of chemotherapy, adjustments in dosing, or return of drug to the pharmacy or oncology clinic.

***Keywords*:** Handling, Chemotherapy, Drug Hazards, At home .

Introduction

Cancer is a group of more than 200 diseases characterized by uncontrolled and unregulated growth of cells. It is a major health problem that occurs in people of all ethnicities. Cancer is a cause of death, accounting for 8.2 million deaths in 2012. Over five and one half million Health Care Workers (HCWs) are potentially exposed to Hazardous Drugs (HDs) in the workplace, most drugs defined as hazardous are cytotoxic agents used in the treatment of cancer ***(WHO, 2012).***

Treatment options offered to cancer patients should be based on realistic and achievable goals for each specific type of cancer. Chemotherapy is the use of chemical drugs to kill cancer cells. It is called a "systemic treatment" since the drug, entering through the blood stream, travels throughout the body and kills cancer cells at their sites. It aims to provide a cure, control spread of the disease, or palliate symptoms of suffering. Chemotherapy works by stopping or slowing the growth of cancer cells, which grow and divide quickly. But it can also harm healthy cells that divide quickly, such as those that line the mouth and intestines or cause the hair to grow. Damage to healthy cells may cause side effects. Often, side effects get better or go away after chemotherapy is over ***(NCI, 2010).***

Chemotherapy is now a main stay of cancer therapy used in the treatment of most of solid tumors and hematologic malignancies like leukaemia, lymphomas, myeloma and myelodysplastic syndromes. Cytotoxic drugs are therapeutic agents mainly used in chemotherapy for their actions on killing cancerous cell ***(LeBlanc et al., 2015).*** Many antineoplastic drugs are considered to be high-alert medications by the Institute for Safe Medication Practices (ISMP) and are considered hazardous by the National Institute for Occupational Safety and Health (NIOSH) ***(NIOSH, 2012).*** Anti neoplastic drugs (ADs) are among the most commonly used hazardous drugs identified as carcinogenic by the International Agency for Research on Cancer ***(International Agency for Research on Cancer, 2014).***

Exposure to chemotherapy drugs is associated with many adverse outcomes for occupationally exposed individuals including but not limited to: contact dermatitis; deoxyribonucleic acid (DNA) damage; chromosomal abnormalities; fetal loss; infertility; preterm births; and an over all increase in one's personal risk for cancer ***(Chang, Adami, Boffetta, Wedner, & Mandel, 2016).***

Since exposure to HDs is associated with adverse outcomes, safe handling precautions are recommended to reduce or eliminate exposure for health care workers. The recommended methods for reducing HD exposure include 1)Biological Safety Cabinets (BSCs) to protect against inhalation exposure during drug preparation; 2) Two pairs of

disposable gloves that are powder free and have been tested for use with HDs; 3) Adisposable gown made of chemical-protective fabric with long sleeves, cuffs and back closure; 4) A NIOSH-approved respirator to protect against aerosols; 5) Eye and face shield that provides splash protection; 6) Administrative controls and 7) Careful work practices to reduce opportunities for exposure. All precautions, when used consistently, can reduce occupational exposure to HDs ***(Good in et al., 2011).***

Significance of the study:

Self-administration of oral chemotherapy has increased because of the availability of novel therapeutic agents. Numerous advantages to the use of oral chemotherapy have been described, including increased control and convenience for the patient, potential increase in the quality of life, sustained medication exposure, and potential reduction in travel costs and use of health care resources ***(Goodin et al., 2011).***

Despite these advantages, it is imperative to note that multiple factors associated with oral chemotherapy can compromise patient safety and contribute to medication errors, contamination, and inadvertent exposure to other individuals due to lack of knowledge and practice toward safe handling toward chemotherapy ***(Goodin et al., 2011).***

Progressive increase in number of cancer incident cases in Egypt from 114,985 in 2013 to 331,169 in 2050, approximately 29% of 2013 incidence ***(Elshamy, 2016).***

Aim of the study

Aim of the Study was to assess chemotherapy drugs hazards among adult at home through:

1. Identifying Adult's knowledges regarding Handling of Chemotherapy Drugs Hazards among adult at home.
2. Assessing Adult's practices regarding Handling of chemotherapy Drugs Hazards among adults at home
3. Assessing Adult's health status regarding handling of chemotherapy drugs hazards

Research Questions:

1. Is there a relation between adult's socio demographic and their knowledges regarding handling chemotherapy drugs hazards at home?
2. Is there a relation between adult's socio demographic status and their practices regarding handling chemotherapy drugs hazards at home?
3. Is there a relation between adult's knowledges and their practices regarding handling chemotherapy drugs hazards at home?
4. Is there a relation between adult's practices and their health status regarding handling chemotherapy drug hazards at home.

Part (I): Chemotherapy Drugs

Chemotherapy is the use of medicines or drugs to treat a disease, such as cancer. Many times this treatment is just called chemo. Surgery and radiation therapy remove, kill or damage cancer cells in a certain area, but chemo can work throughout the whole body. Chemo can kill cancer cells that have metastasized (meh-TAS-tuh-SIZED) or spread toparts of the body far away from the primary (original) tumor ***(Kareva, Waxman, & Klement, 2015)***. In the original sense, a chemical that binds to and specifically kills microbes or tumor cells ***(Polakis, 2016)***.

Treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping them from dividing. Chemotherapy may be given by mouth, injection, or infusion or on the skin, depending on the type and stage of the cancer being treated. It may be given alone or with other treatments, such as surgery, radiation therapy or biologic therapy types of chemotherapy ***(Orlandi et al., 2007).***

Types of Chemotherapy Drugs:

More than 100 chemo drugs are used in many combinations. A single chemo drug can be used to treat cancer but often multiple drugs are used in a certain order or in certain combinations (called combination chemotherapy) ***(Miller et al., 2016).*** Multiple drugs with different actions

can work together to kill more cancer cells. This can also reduce the chance that the cancer may become resistant to any one chemo drug the patient and the physician will decide what drug or combination of drugs the patient will get. The physician will choose the doses, how the drugs will be given, and how often and how long patient will get treatment. All of these decisions will depend on the type of cancer, where it is, how big it is, and how it affects the patient's normal body functions and overall health ***(Morton et al., 2014)***.

- **Alkylating Agents**: The most active in the resting phase of the cell. These types of drugs are cell-cycle non-specific. There are several types of alkylating agents used in chemotherapy treatment, Mustard gas derivatives (Mechlorethamine, Cyclophosphamide, Chlorambucil, Melphalan and Ifosfamide), Ethylenimines (Thiotepa and Hexamethyl-melamine), Alkylsulfonates (Busulfan), Hydrazines and Triazines (Altretamine, Procarbazine, Dacarbazine and Temozolomide), Nitrosureas (Carmustine, Lomustine and Streptozocin). Nitrosureas are unique because unlike most types of chemo treatments. They can cross the blood-brain barrier. It can be useful in treating brain tumors, Metal salts (Carboplatin, Cisplatin and Oxaliplatin) ***(Miller et al., 2016).***
- **Plant Alkaloids:** -chemotherapy treatments derived made from certain types of plants. The vinca alkaloids are made