Compliance To Safety Measures Toward Radiation Hazards Among The Health Team

Thesis

Submitted for the Partial Fulfillment of

Master Degree in Nursing Science

(Community Health Nursing)

By

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الالتزام بإجراءات السلامة تجاه مخاطر الإشعاع لدى الفريق الصحي

خطة بحـــــــــث

توطئة للحصول على درجة الماجستير فى علوم التمريض

(تمريض صحة المجتمع)

تحت إشراف

أ.د / أميـــــــرة البيـــــــه

أستاذ تمريض صحة المجتمع بكلية التمريض

جامعة عين شمس

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مدرس تمريض صحة المجتمع بكلية التمريض

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Summary

Work is generally considered one of life worthwhile and exciting experiences. Most adults spend approximately one-fourth to one-third of their time at work. Although most workers may never face any serious adverse health effects from workplace exposure, all types of work have hazards(***(Lundy and Janes; 2005).***

Radiation is a threat to health in work place and in general environment, the extent of danger depends on the dose and type of radiation. Prolonged exposure to radiation can cause skin ulcers, damage to cells, cancer, premature aging, kidney dysfunction, cataracts, and genetic disorders in the children of those cells have been damaged ***(Gawenda, 2003).***

Radiation therapy a local treatment modality for cancer, it is one of the oldest methods of cancer treatment. Radiation therapy is a major cancer treatment that can be used alone or combination with other therapies (**Burner, 2008).**

Physicians, radiologists, technicians, nurses and house keeper are exposed to different occupational hazards, especially who work in radiation department. The workers can minimize the exposure to radiation by preventive strategies ***(Ladou, 2004).***

Personal protective equipment (PPE) is designed to protect employees from serious workplace injuries or illnesses resulting from contact with chemical radiological, physical, electrical, mechanical, or other workplace hazards. Besides face shields, safety glasses, hard hates, and safety shoes, PPE includes a variety of devices and garments such as goggles, coveralls, gloves, vests, earplugs, and respirators **(OSHA, 2004).**

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ILO	**International Labor Organization**
OSHA	**Occupational Safety Health and Association**
PPE	**Personal Protective Equipment**
CAPMAS	**Central Agency for Public Mobilization And Statistic**
CT	**Computed Tomography**
MRI	**Magnetic Resonce Imaging**
NRC	**Nuclear Regulator Commission**
RSA	**Radiation Safety Adviser**
DRSO	**Departmental Radiation Safety Officer**
NCI	**National Cancer Institute**
PPD	**Personal Protective Devise**
GIT	**Gastro Intestenal Tract**
RED	**Radiation Absorbed Dose**
REM	**Reontgen Equivalant Mammal**
DNA	**Deoxyribo Nucleic Acid**

Abstract

Introduction: Radiation is a threat to health in work place and in general environment. Workers in radiation therapy department are exposed to variety type of occupational hazards. health and safety measures compliance may decrease the health sequences of hazards to exposure. **Aim:** the study aimed to find out compliance to safety measures toward radiation hazards among the health team. **Reserch design :**A descriptive design was used in this study**. Setting:** the study were conducted at two Department of Radiation Therapy (DRT) settings, National Cancer Institute (NCI) and El demerdash hospital in Ain Shams university affiliated to the largest cancer hospitals at Cairo governorate. A purposive sample (108) health team members in two settings were selected. **(1**)self administer questionnaire, **(2)** health team compliance observation checklist. **Results :** finding revealed that, most of studied sample age were 35-45 years and had secondary education, most of them had unsatisfactory awareness and most of them were not compliant to health and safety measures while compliance were more in safety practices. **Conclusion and Recommendation:** the study concluded there were lack of awareness about radiation therapy, radiation hazards, and radiation safety measures specially technician, nurses, and clerk and low level of compliance to health and safety measures. There were significant statistical differences between health team awareness and their sociodemographic characteristic, and a significant statistical differences in relation between their awareness and compliance**.** the study recommended establish plans for periodical safety training courses for health team member in radiation sitting to help in improving their practice and update their awareness.

Keywords: Radiation therapy, Safety measures , Compliance, personal protective equipment (PPE), Occupational health nursing.

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Introduction

Work is considered one of the important value of life in the life of individual and society that progress of peoples measured and attended according to their interest in working**(lundy and janes, 2006**).

Ionizing radiations are the hazardous agents in workplace and all forms of ionizing radiation produce some type of injuries. Awareness regarding applications of protection guidelines and knowledge about principles of radiation protection can play important role in health of employees **(Amirzadeh, 2007).**

Health hazards from radiation may occur shortly after exposure or it may delayed. Health effects resulting from chronic exposure may be including genetic defects, cancer, benign tumors, skin changes and congenital defects. The more immediate defects may include radiation sickness (hemorrhaging, anemia, loss of body fluids and bacterial infections(**Lewis et al , 2008).**

Radiation therapy employs ionizing radiation to treat diseases. Although it can be used to treat specific benign diseases, such as hyperthyroidism and benign brain tumors, it is most commonly used to treat malignant tumors. Although cancers are often considered a disease of aging, with the majority of cases (76%) diagnosed in cancer over the age of 55 years, it occurs in people of all ages. An estimated number of cancer 1.399, 780 persons were diagnosed in 2006 excluding skin cancer (more than 1 million are diagnosed annually) in USA ***(Gates et al., 2008).***

To protect the workers in radiation therapy departments from radiation hazards should wear monitoring devices (e.g a film badge) to measure commutative radiation exposure. On the other hand the workers are protected from radiation by environmental design and rules of activity

and location which assure shielding and distance from the radiation source and the walls of therapy room are thick concrete, in addition to personal protective devices such as helmet for head protection, goggles for eye protection, ear plugs for ear protection, mask for lung protections etc ***(Higgs et al., 2004).***

Compliance is a term used to describe submission or yielding to predetermined goals , compliance is an observable behavior and as such can directly measured. Compliance depends on various factors, including the person's motivation, perception of vulnerability and beliefs about controlling or preventing illness, environmental variables, quality of health instruction, and ability to access resources**(Sanaei et al, 2008)**.

According to **Moures (2005)** the occupational health nurse has special knowledge about understanding of the principle of safety, toxicology, industrial hygiene, epidemiology and environmental health, additionally, special skills in training in safety hazards, disaster planning, for military with safety equipment, ability to plan and implement health and educational program.

Significance of study

In Egypt the number of cancer patients have an increase 100.000 patient every years, National Cancer Institute (NCI) receive 18.000 patient every year . Approximately 60% of all patients of cancer will receive radiation therapy during some stages of their illness; so the health team exposes to frequency times of radiation doses during their work and this causes increasing radiation hazards ***(Ministry of Health and Population, 2008).***

Part 1

Radiation Therapy and health hazards

Health at work is an important issue for most individuals for whom. The nures provides care as many individuals spend much of their time at work place which can be a primary site for the delivery of health promotion and illness prevention **(Stanhope and Lancaster, 2006).**

Rdiation is generated by common sources like the sun, radioactive materials and electroic devices. It can be classified as ionizing and non-ionizing. Although ionizing radiation is used for beneficicial purposes in medicine and indastry. It can present health hazards if it's not properly menitored and controlled(**Juall, 2005)**.

Radiation therapy is a local treatment modality for cancer, it is one of the oldest methods of cancer treatment. Radiation therapy is a major cancer treatment that can be used alone or in combination with other therapies (**Burner, 2008).**

Definition

Radiation therapy is the use high-energy ionizing rays or particles to cause damage or changes to cells. Approximately 60% of all person with cancer will be treated with radiation at some point during their illness. It is also used occasionally to treat benign tumors(**Elf &Wikblad, 2007)**.

Indications of radiation therapy treatment:

The goals of radiation therapy in oncology patient care setting are similar to treatment goals for other cancer therapies and include cure of disease, to control disease locally or limitation of growth, palliation of

distressing symptoms and prophylaxis or prevention of desease recurring in particular bady site (**Kethyn, 2006).**

Higgs et al (2004) stated that radiotherapy is treatment of choice for the control of cancer in many sites . **Pinkirton et al**, **(2008)** added that in other situations it is used with curative intent, in conjunction with surgery or chemotherapy, it is also used for the relief of symptoms resulting from cancer.

Methods of radiation therapy treatment

Radiation can be delivered to tumors or disease by two basic methods, externally or internally. When it is delivered from out sides it is called external radiation, teletherapy,or external beam. Internal radiation is radiation placed inside the body by using sealed or unsealed forms of radioisotopes. Sealed - source applications are usually refered to as brachytherapy. The radiation oncologist selects the method of treatment based upon an individual tumor type, size, location, dosage needed, potential side effects, factors related to the individual and the availability of resources for the particular method, for some tumors, a combination of external and internal radiation is needed (**Allender & Spradly, 2005).**

1 - External radiation therapy (teletherapy) :

This is most commonly used in clinical radiotherapy. Out of all patients treated with radiotherapy, globally 70% receive external beam therapy. It is characterized by the use of an external beam generated in a small radiation source placed at a distance from the skin that varies from a few centimeters to more than 100 cm (**Moyer & Hinds, 2003).**