



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Ionizing Radiation Hazards among Radiology Health Team

Thesis

*Submitted for Partial Fulfillment of Master Degree in
Nursing Sciences (Community Health Nursing)*

By

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*First, all praises to **Allah**, the most gracious, the most merciful and blessing and peace to his messenger.*

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List of Abbreviations

Abb.	Full Term
AEO	Atomic Energy Organization
ALADA	As Low As Diagnostically Acceptable
ALARA	As Low As Reasonably Achievable
ARS	Acute Radiation Syndrome
BEIR	Biological Effects Of Ionizing Radiation
BMC	Bone Marrow Cells
CAT	Computerized Axial Tomography
CDRH	Center For Devices And Radiology Health
CML	Chronic Myelogenous Leukemia
CNS	Central Nervous System
CRI	Cutaneous Radiation Injury
CT	Computed Tomography
CVD	Cardiovascular Disease
DFI	Dna Fragmentation Index
DR	Diagnostic Radiation
ELF	Extremely Low Frequency
EMF	Electromagnetic Fields
EPA	Environmental Protection Agency
FIH	Fayoum Insurance Hospital
GFH	General Fayoum Hospital
GIT	Gastrointestinal Tract
HCT	Hematocrit
HCWs	Healthcare Workers
HD	Heart Disease
HDR	High-Dose Radiation
IAEA	International Atomic Energy Agency
ICRP	The International Commission On Radiological Protection
IHD	Ischemic Heart Disease
IR	Ionizing Radiation
IRPA	International Radiation Protection Association

Abb.	Full Term
KAP	Knowledge, Attitude And Practice
KVP	Kilovoltage Peak
LBP	Low Back Pain
LD	Lethal Dose
LET	Linear Energy Transfer
LNT	Linear No Threshold
LSS	Limited Sampling Schedule
MCH	Mean Corpuscular Hemoglobin
MCHC	Mean Corpuscular Hemoglobin Concentration
MCV	Mean Corpuscular Volume
MFUH	Medical Fayoum University Hospital
MOHP	Ministry Of Health And Population
MRI	Magnetic Resonance Imaging
MSD	Musculoskeletal Disease
NCRP	National Council On Radiation Protection And Measurements
NIR	Non-Ionizing Radiation
NM	Nuclear Medicine
NRC	Nuclear Regulatory Commission
PC	Personal Computer
PPDs	Personal Protective Devices
PPE	Personal Protective Equipment
RPC	Radiation Protection Culture
RT	Radiotherapy
SFUH	Surgical Fayoum University Hospital
SPSS	Statistical Package For Social Sciences
TLDs	Thermo Luminescent Dosimeters
USNRC	United States Nuclear Regulatory Commission
VLF	Very Low Frequency
WBCs	White Blood Cells
WHO	World Health Organization
WRI	Work Related Ill-Health

Ionizing Radiation Hazards among Radiology Health Team

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Abstract

Ionizing radiation is an energy type in the form of electromagnetic waves or particles. Radiographic imaging is extremely valuable as a diagnostic tool in medical fields leading to different health hazards to radiology health team and to the surrounding environment if safety measures are not observed. **Aim of the Study:** To assess the ionizing radiation hazards among Radiology Health Team. **Subject and Methods:** A descriptive analytical research design was utilized. **Setting:** The study was conducted in radiology departments in 4 urban hospitals at Fayoum city: (surgical Fayoum university hospital, medical Fayoum university hospital, Fayoum Health Insurance hospital, Fayoum General Hospital). **Sample:** A purposive sample of all available radiology health team who are working with X-Ray devices in the selected settings. The total sample reached 150 persons. **Tools:** Three tools were used; 1st tool Ionizing Radiation Hazards Structured Questionnaire. 2nd tool Observational checklist of the ionizing radiation protection practices among radiology health team. 3rd tool Observational checklist of Environmental safety. **Results:** reveals that, the studied sample ' age ranged between 20 and 55 years, with mean 34.04 ± 8.83 years. 40.7% of the studied sample were aged between 30 and 39 years old, with slightly more male 62.0%. Concerning job title, 43.3% of participants were working as radiology technician, radiologist 23.4%, nurse 33.3 and had 6 to 10 years of experience 30.7%.. Concerning hazards exposure 52% of the studied sample reported physics hazards followed by biological and physical hazards 39.3% then chemical hazards 22.0%.the results also demonstrates that 90.0% of the studied sample hasn't had health problems before joining the field of ionizing radiation. On the other hand, after joining the field of ionizing radiation 67.3% of the studied sample was having health problems as anemia 18.7%. **Conclusion:** there was a relation between the studied sample' practices, job title, years of experience and receiving training program. There was negative correlation between knowledge and health problems. knowledge had positive correlations with practices, also work hazards and health problems **Recommendation:** Educational programs about ionizing radiation hazards and protection practices should be obligatory to all radiology health team.

Keywords: Ionizing radiation, Ionizing radiation hazards, Radiology Health Team.

Introduction

Radiation is energy come from unstable atoms that undergo radioactive decay, or it can be produced by machines. Radiation travels from its source in the form of energy waves or energized particles. Common sources of radiation include radon gas, cosmic rays from outer space, medical x-rays, and energy given off by a radioisotope (unstable form of a chemical element that releases radiation as it breaks down and becomes more stable). Radiation can damage cells. It is used to diagnose and treat some types of cancer **(Environmental Protection Agency (EPA), 2021)**.

Ionizing radiation (IR) is a type of energy released by atoms that travels in the form of electromagnetic waves gamma or X-rays or particles neutrons, beta or alpha. The spontaneous disintegration of atoms is called radioactivity, and the excess energy emitted is a form of ionizing radiation. Unstable elements which disintegrate and emit ionizing radiation are called radionuclides. All radionuclides are uniquely identified by the type of radiation they emit, the energy of the radiation, and their half-life **(Matthias et al., 2020)**.

Medical use of radiation accounts for 98 % of the population dose contribution from all artificial sources, and represents 20% of the total population exposure. Annually worldwide, more than 3600 million diagnostic radiology examinations are performed, 37 million nuclear medicine