



بسم الله الرحمن الرحيم

إنما يخشى الله من عباده  
العلماء إن الله  
( عزيز غفور )

،، صدق الله العظيم

فاطر 28

# Dedication To

***my parents,***

***My teachers,***

***And friends***

For giving me never-endless gifts of  
encouragement, love and patience

# Acknowledgement

*I would like to express my sincere gratitude to*  
**Associate Professor Dr. Mohamed Mohamed**  
**Omer Mohamed Yousef**

*who has given me great advice and help in the whole process of my thesis for his fruitful day to day supervision, guidance, endless help and encouragement that built confidence in my work for his valuable and continuous help, his patience through all the years that made this work possible for giving this opportunity of study ,and for endless encouragement and unlimited support .*

*My thanks extend also to colleagues in Aniline Diagnostic Centre and Royal care international hospital ,colleagues in College Medical Radiological Science and all Library staff of Medical Radiological College. for contributing in the sample collections. My friends for their assistance in many social activities through all the periods of the study.*

*Thanks are also extended to all staff of the College of Medical Radiological Sciences for their endless moral support and encouragement.*

*I would like to thank everyone who assisted by one way or another to bring this study to the light.*

## **Abstract**

An accident is: “Any unintended event including operating errors, equipment failures or other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection and safety

The study was assessed the frequency, causes and occurrence of radiation accidents with some significant exposure to human.

This study was done at Khartoum state hospitals in nuclear medicine centers and found that more detailed information is provided in tabulated form on the health consequences of those radiation accidents that occurred in nuclear medicine departments at Khartoum state hospitals , so this study provided the key statistical data and information on these aspects, pointing to the necessity of preventing from the common accidental radiation causes. It concluded that the main causes of radiation accidents in various application due to insufficiency of radiation protection and radiation safety regulations, human error due to insufficient knowledge of radiation protection and radiation safety regulations; insufficient or inappropriate training of radiation protection and radiation safety rules and regulations;

## ملخص الدراسة

الحادث هو اي حدث غير م قصود بما في ذلك اخطاء التشغيل وفشل المعدات او غيرها من الحوادث المؤسفة فان لها من العواقب او النتائج المحتملة التي لا يستهان بها من وجهة نظر الحماية والسلامة .

تم في هذه الدراسة تقييم وتيرة أسباب و قوع الحوادث الاشعاعية . مع بعض التعرض الكبير للإنسان لهذه الحوادث . و قد تمت هذه الدراسة في مستشفيات و لاية الخرطوم ومراكز الطب النووي , ووجدت ان يتم توفير المزيد من المعلومات المفصلة في شكل جداول علي الأثار الصحية المترتبة علي الحوادث الاشعاعية التي وقعت في قسم الطب النووي في مستشفيات و لاية الخرطوم و لذلك قدمت هذه الدراسة البيانات الإحصائية الرئيسية ومعلومات عن هذا الجانب ,ولافتا الي ضرورة منع اسباب التعرض الإشعاعية العرضية وخلصت الي ان الأسباب الرئيسية لحدوث هذه الحوادث عدم كفاية تطبيق انظمة الحماية والسلامة من الاشعاع والخطأ البشري ايضا يتسبب في عدم المعرفة الكافية لهذه الانظمة, وعدم التدريب المناسب لهذه الانظمة واللوائح للحماية والوقاية من الاشعاع .

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## List of abbreviations

<b>ALARA</b>	Low As Achievable Reasonably.
<b>CT</b>	Computed x-ray Tomography.
<b>DNA</b>	Deoxyribonucleic Acid
<b>FDG</b>	Fluoro-Deoxy Glucose
<b>IAEA</b>	International Atomic Energy Agency
<b>ICRP</b>	International Commission on Radiological Protection
<b>LET</b>	Liner Energy Transfer
<b>MPI</b>	Myocardial Profusion Imaging
<b>MRI</b>	Magnetic Resonance Imaging
<b>MO-99</b>	Molybdenum-99
<b>PET</b>	Positron Emission Tomography
<b>RERF</b>	Radiation Effect Research Foundation
<b>RNT</b>	Radionuclide therapy
<b>RPOs</b>	Radiation protection officers
<b>SPECT</b>	Single photon Emission Computed Tomography
<b>Tc-99</b>	Technetium-99
<b>TAT</b>	Target Alpha Therapy
<b>US</b>	United States
<b>WHO</b>	World health Organization