

**Sudan University Of Science and Technology**

**College of Graduate Studies**

**Evaluation Of MRI Safety procedures In Medical Centers**

**Khartoum State**

**تقويم إجراءات سلامة التصوير بالرنين المغنطيسي للمراكز الطبية – بولاية الخرطوم**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى :

{ وَ إِنْ يَمْسَسْكَ اللَّهُ بِضْرَ فَلَا تَأْخُذْ بِهِ إِلَّا هُوَ إِنْ يَرِدْكَ بِخَيْرٍ فَلَا رَادَّ

لِفَضْلِهِ يُصِيبُ بِهِ مَنْ يَشَاءُ مِنْ عِبَادِهِ وَ هُوَ الْغَفُورُ الرَّحِيمُ (107) }

صدق الله العظيم

سورة يونس

## Dedication

*I dedicate this thesis To*

*The candles that burn to light my way,*

*My lovely parents*

*My father **Tah**who made all the cheap*

*and precious for the sake of my arrival to this stage,*

*My mother **Aida**who showed*

*me how to choose my way, and support me all time*

*My darling **brothers***

*Whom made me proud patience, and support were essential to*

*the completion of this research,*

*My lovely **sisters**, whom were stand behind me*

*to complete this work*

*My **friends** support me all the time and my colleagues.*

## **Acknowledgment**

*Praise and thanks are to ALLAH the lord and creator of the world*

*I would like to offer my thanks and gratitude*

*To My supervisor: Dr. Husain Ahmed Hassan who had kindly supervised this dissertation and had shown every encouragement and support during the preliminary and final setup of the work.*

*Special thanks also to all the staffs of MRI Servicediagnostics in advance Khartoum diagnosticcenter, alnillien diagnostic center and Asia hospital*

*I cannot find words to express my gratitude to my sisters whom share me the credit of my life thanks also to My friends for the generous and endless support through all my work*

## ABSTRACT

This study is aim for looking about the Magnetic resonance imaging risks and the knowledge of the persons whom dealing with it about that risks and level of the application of the safety preparation . This study was done on Khartoum state and it applied on three diagnostic centers (advanced Khartoum diagnostic center , AL-nillien center and Asia hospital ). During this study the centers was visited at time working and I give the questioner about the safety application and it was analyzed by Excel program. The questioner was directed to ward center groups ( 36 patients with different gender and age , 15 technicians , 6 managers and 5 house workers ) . The study shows that the knowledge of both technologists and house workers about safety application and using was (100%) but the using of safety application by the managers was (50%); the patients knowledge about the safety application was (68.8%) but (75%)of them didn't had an explanation of safety application by the technicians . At the level of centers some of them didn't have the most simple safety preparation which is the personal data form that filled by the patients .

Lastly the MRI device is one of the most safe diagnostic machian if we care about the safety application .

## مستخلص الدراسة

تهدف هذه الدراسة الي التعرف على مدى الالمام باخطار جهاز الرنين المغنطيسي من قبل الاشخاص الذين يتعاملون معه و مستوى تطبيق اجراءات السلامة في المراكز التشخيصيه للتقليل من حدوث هذه الاخطار .

وقد اجريت هذه الدراسة في ولاية الخرطوم و شملت ثلاثة مراكز تشخيصيه وهي مركز الخرطوم التشخيصي المتطور , مركز النيلين التشخيصي و مستشفى آسيا .

خلال هذه الدراسة قمنا بزيارة المراكز اعلاه اثناء فترة العمل و طرحنا استبيان عن اجراءات السلامة ثم قمنا بتحليلها بواسطة برنامج اكزيل.

وقد استهدف الاستبيان مجموعة فئات تشمل 36 مريض بمختلف الاجناس و الاعمار و 15 تقني و 6 اداريين و 5 عمال نظافه .

فوجدنا ان مدى معرفة عمال النظافه و التقنيين باجراءات السلامة و اتباعها تكاد تكون (100%) و نجد التقصير في اتباع اجراءات السلامة كان من جهة الاداريين بنسبة (50%)

اما بالنسبه للمريض فان مدى معرفتهم بالجهاز و اجراءات السلامة كانت بنسبة (68.8%)

اذ ان (75%) منهم لم يتم شرح اجراءات السلامة لهم من قبل التقني .

وعلى مستوى المراكز فقد اتضح ان بعض المراكز تفتقر الي ابسط اجراءات السلامة المتمثله في استمارة المعلومات الخاصه بالمريض .

و اخيرا فان جهاز الرنين المغنطيسي يعد من اكثر الاجهزه التشخيصيه امنا" اذا تم اتباع اجراءات السلامة الازمه .

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## List of abbreviations

MRI	Magnetic resonance imaging
EPI	Echo planar imaging
RF	Radiofrequency
T	Tesla
C	cent gray
K	Fahrenheit
He	Helium
N	Nitrogen
FDA	Food and drug administration
NRPB	National radiological protection board
MDA	Medical devices agency
IEC	International electrotechnical commission
Bo	Strength of the external magnetic field
MHz	Mega harinse

