



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



MONA MAGHRABY



Effect of Using Smart Phones on Balance Functions

Thesis

*Submitted for Partial Fulfillment of Master Degree
in Audiology*

By

Shaimaa Mahmoud El-Saeed Abd El-Wahab

(M.B., B.Ch)

Faculty of Medicine, Zagazig University

Under Supervision of

Prof. Dr. Nagwa Mohamed Abdel Monem Hazzaa

Professor of Audiology, O.R.L Department

Faculty of Medicine – Ain Shams University

Prof. Dr. Dalia Mohamed Hassan

Professor of Audiology, O.R.L Department

Faculty of Medicine – Ain Shams University

*Faculty of Medicine
Ain Shams University
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سببنا أنك لا تعلم لنا
إلا ما علمتنا أنك أنت
العليم العظيم

صدق الله العظيم

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Dedication

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List of Abbreviations

| Abb. | Full term |
|-------------|---|
| ACS..... | American Cancer Society |
| BBS..... | Biodex balance system |
| BDZ..... | Benzodiazepine |
| BSS | Biodex Stability System |
| CDMA..... | Code division multiple access |
| CDP | Computerized dynamic posturography |
| CES..... | Cervical erector spinae |
| COG | Center of gravity |
| COP | Center of pressure |
| CVS..... | Computer vision syndrome |
| CVS-Q..... | Computer vision syndrome questionnaire |
| DES..... | Digital eye strain |
| DSM..... | Diagnostic and Statistical Manual of Mental Disorders |
| EMR..... | Electromagnetic radiation |
| EOM | External ocular muscle |
| FDA | Food and drug administration |
| FHP | Forward head posture |
| GABA..... | Gama amino buteric acid |
| GPS..... | Global positioning system |
| GSM..... | Global System for Mobile Communications |
| HHD | Hand held devices |
| IARC | International Agency for Research on Cancer |
| ICNIRP..... | International Commission on Non-Ionizing Radiation Protection |
| IOP..... | Intraocular pressure |
| IR | Ionising radiation |

List of Abbreviations Cont...

| Abb. | Full term |
|-------------|--|
| ITU | International Telecommunications Union |
| LED | Light emitting diode |
| LOS..... | Limit of stability |
| MRSA | Methicillin-resistant Staphylococcus aureus |
| NHTSA | National Highway Traffic Safety Administration |
| NIR | Non-ionising radiation |
| NSC | National Safety Council |
| OSI..... | Overall stability index |
| PS | Postural stability |
| PVL..... | peripheral vestibular lesion |
| RF EMR..... | Radio frequency electromagnetic radiation |
| RF | Radiofrequency |
| SAR..... | Specific absorption rate |
| SEBT | Star Excursion Balance Test |
| SOT..... | Sensory organization test |
| SPSS..... | Statistical package for Social Science |
| TBUT..... | Tear breakup time |
| TDMA..... | Time division multiple access |
| VDT | visual display terminal |
| VNG..... | Video nystagmography |
| WBB | Wii Balance Board |
| WHO | World Health Organization |

INTRODUCTION AND RATIONALE

In the last few years, the number of smart phones users rises progressively worldwide. They are used at anytime and anyplace as they are easy to carry and to use. Individuals are utilizing them for different tasks on a daily basis. They are used for both communication and entertainment purposes. These tasks include checking social media connections, watching videos, reading books, doing some form of work, browsing the internet and other functions (*Rainie, 2010*).

With the increasing use of smart phones, researches started to study their effects on health with reported physical and psychological hazards.

During use, mobile phones emit radiofrequency energy, a form of non-ionizing electromagnetic radiation, which can be absorbed by tissues close to the phone. The amount of radiofrequency energy a mobile phone user is exposed depends on many factors as the technology of the phone, the distance between the phone and the user, the extent and type of mobile phone use and the user's distance from cell phone towers (*Volkow et al., 2011*).

In 2011, International Agency for Research on Cancer (IARC) classified mobile phone radiation as possibly carcinogenic, means that there “could be some risk” of carcinogenicity, but cancer risks for glioma and acoustic