

THE INTERCONNECTION BETWEEN CELL PHONE USAGE AND EAR PROBLEMS AMIDST MEDICAL STUDENTS, TAIBAH UNIVERSITY

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ABSTRACT

Background: Concerns regarding the potential physiological effects of exposure to radio frequency (RF) radiation have been increased recently. **Objective:** This study explores a relationship between the use of mobile phone and auditory problems and the gender difference among medical students in Taibah University in Al Madinah Al Monawarrah. **Methods:** A cross-sectional study was conducted at Faculty of Medicine, Taibah University, Al Madinah Al Monawarrah, Kingdom of Saudi Arabia during the year 2013- 2014. For this purpose a questionnaire was used as data collection tool. **Results:** There were

statistically significant difference between student's gender and vertigo (P-value= 0.001); tinnitus (P-value= 0.001), dizziness (P-value = 0.001). **Conclusion:** These results demonstrated high prevalence of ear problems among female medical students.

KEYWORDS: Mobile Phone, auditory problems, dizziness, tinnitus, hearing loss, headset, duration of call.

INTRODUCTION

Mobile phones have many perceived benefits, including increased accessibility and social connection, efficiency in the workplace, convenience, and improved safety. However, in last years, there has been rising in public concern in the negative consequences of mobile phone use (Merlo et al., 2013).

Mobile phones spread many radio hesitation or microwave rays. Risk of xposure to these radiations could affect human veracity directly. There is worry that radiation might increase

the incidence of cancer, which gives different symptoms could affect human life as sleep problem, memory troubles headaches, nausea, and dizziness (Maier, 2002). modifications in the blood-brain barrier permeability, electrical activity of brain, and blood pressure have also been reported (Hermann and Hossmann, 1997). Other danger of use mobile phones illustrates in car accidents, in indirect way.

In one Saudi Arabian study, 44.4% of participant related popular health issues for instance headache, difficulty in concentrating, hearing damage, and fatigue in addition to memory loss due to mobile phone use (Khan, 2008). Whereas, another study was done in Saudi Arabian showed that 3%-4% of cell phone users coming with troubles like tension, fatigue, sleep disorder, and dizziness related to their mobile phone use, while over 20% present with headaches (Al-Khlaiwi and Meo, 2004) inability to concentrate during driving one of the main causes of accident (Laberge-Nadeau *et al.*, 2003; McCartt, *et al.*, 2006) have been highlighted as a public health concern.

So, the aim of this project was to assess the auditory disturbances accompanying the use of mobile phone among medical students in Taibah University.

METHODS

In school of Medicine, at Taibah University, Median, Kingdom of Saudi Arabia on September- November at the academic year 2013- 2014, We did this cross-sectional study. 239 Members males and females medical students from the first year up to third academic years, was questioned by (self-administered was designed in English language) to determine about age, gender, academic level, type of mobile phone, the duration of usage of the mobile phone, the average duration of call any past history of auditory problem, and the feeling of vertigo, tinnitus, dizziness and hearing loss. students were participated in this study with full awareness and their information won't be disclosed to any third parties.

Statistical analysis

We have used Statistical Package for the Social Sciences version 16.0 (SPSS, Inc. Chicago, IL) to analyze the data. Frequency tables were used to present the distribution of nominal variables. Results were expressed in numbers and percentages of respondents to each question and presented in a table. Non-parametric Chi-square test was used. A p-value less than 0.05 were considered statistically significant.

RESULTS

A 239 from total population of 445 students were responses to our study with a response rate of 53.7%.

Study population was distributed as follows: male students (24.7%) and female (75.3%) as shown in table 1. The average age was 20.5 years, where it ranging from 18 to 23 years. There were an equal distributed of students in the three academic years, however, the number of responses from the male side was less because of inaccessibility due to the separate campuses.

Table (2) showed statistically significant relationship between students' sex and the duration of cell phone use (P-value = 0.0001), type of mobile phone (P-value= 0.287), the use of headset (P-value = 0.16), the duration of call (P-value= 0.038), use of the cell phone if the signal is weak (P-value = 0.28) and the past history of ear diseases (P- value = 0.267).

Table (3) and figure (3) showed the statistically significant relationship between students' gender and vertigo (P-value = 0.0001), tinnitus (P- value = 0.0001), dizziness (P- value = 0.001) and hearing loss (P- value = 0.2).

Table 1: Distribution of male and female respondents.

| | Number | (%) |
|--------|--------|------|
| Male | 59 | 24.7 |
| Female | 180 | 75.3 |
| Total | 239 | 100 |

Table 2: Gender differences in the study variables.

| Items | male N. (%) | female N. (%) | P-value |
|---|----------------|------------------|---------|
| Use mobile phone | | | |
| < 3 years | 6(10.2) | 33 (18.3) | 0.007 |
| 5. years | 5(8.5) | 40 (22.2) | |
| 5-7 years | 12(20.3) | 40 (22.2) | |
| > 7 years | 35(59.3) | 65 (36.1) | |
| Preferred type of mobile | | | |
| I Phone | 28(47.5) | 77 (42.8) | 0.287 |
| Blackberry | 4(6.8) | 23 (12.8) | |
| Samsung | 19(32.2) | 68 (37.8) | |
| Nokia | 5 (8.5) | 9 (5) | |
| Others (specify) | 3 (5.1) | 3 (1.7) | |
| Use headset | | | |
| Always | 10 (16.9) | 41(22.8) | 0.16 |
| Sometimes | 27 (45.8) | 96 (53.3) | |
| Seldom | 10 (16.9) | 25 (13.9) | |
| Never | 11 (18.6) | 16 (8.9) | |
| Duration of call | | | |
| Less than 5 minutes | 27 (45.8) | 60 (33.3) | 0.038 |
| 5-10 min. | 23 (39) | 48(26.7) | |
| 10-30 min. | 6 (10.2) | 43 (23.9) | |
| 30-60 min. | 2 (3.4) | 17(9.4) | |
| 60- 120 min. | 1(1.7) | 8 (4.4) | |
| > 120 min. | 0 | 2 (1.1) | |
| Use of the phone if the signal is weak | | | |
| Yes | 44 (74.6) | 117 (65) | 0.282 |
| No | 15 (25.4) | 61(33.9) | |
| Past history of ear diseases | | | |
| Yes (specify) | 4 (6.8) | 21(11.7) | 0.267 |
| No | 55 (93.2) | 155(86.1) | |

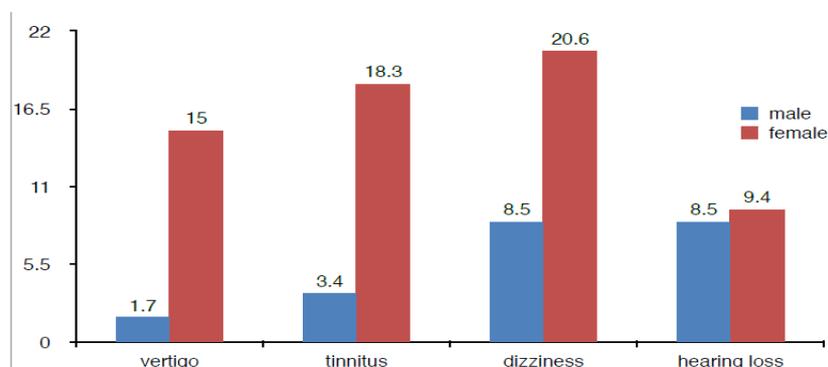


Figure (1): The percentage of the auditory problems of mobile use among the medical students. * significant < 0.05.

DISCUSSION

This study was conducted to appreciate the health hazards produced by electromagnetic waves of mobile phones among medical students in Faculty of Medicine, Taibah University. The study displayed that 59.3% of the male students and 36.1% of the female students used mobile phone for more than 7 years and the duration of call was less than 5 minutes in 45.8% and 33.3% in male and female students respectively. The study revealed that there was no past history of ear diseases in 93.2% and 86.1% in male and female students. The current study revealed that female students were significantly complained of ear diseases more than male students. Mobile phone use was associated with vertigo (1.7% and 15% in male and female students; $P=0.0001$), tinnitus (3.4% and 18.3% in male and female students; $P=0.0001$), dizziness (8.5% and 20.6% in male and female students; $P=0.001$) and hearing loss (1.7% and 2.2% in male and female students; $P=0.2$). There was no relation between these ear disturbances and the duration of call.

This result is in agreement with the study of **Küçer and Pamukçu (2013)** who found that women significantly complained more often with headache, vertigo/ dizziness, fatigue, forgetfulness and tension-anxiety than men.

Meo and Al-Drees, (2005) showed a combination between the mobile phones usage and hearing illness. Around 34.59% of issues were related with impaired hearing, ear ache and/or warmth on the ear. **Schüz et al. (2009)** discover a little, but statistically serious, combination between cell phone use and migraine and vertigo. Exposure to radio frequency (RF) radiation waves may have a negative effect on the tissues that are near the handset, such as the auditory nerve. These hazards include tumors, acoustic neuromas, and other potential concerns (**Lönn, 2004**). The chance of Audiologic disturbances may be increased with increases cell phone usage. Other factors may be combined with duration of exposure to radiation or the state of a person's central nervous system and immune system (**Galeev, 2000**).

Panda et al. (2010) found that High-frequency loss and absent distortion product otoacoustic emissions were observed with an increase in the duration of mobile phone use, heavy use of mobile phones, and age more than 30 years. They concluded that long-term and heavy mobile phone use may lead to inner ear damage.

In contrast of the result of the current study, **Davidson HC**, Lutman **ME** (2007) found no harmful effects of mobile phone usage on their audiovestibular systems within the normal range of exposure of the study.

Moreover, Frei et al. (2012) did not observe an association between radio frequency electromagnetic fields (RF-EMF) exposure and non-specific symptoms or tinnitus.

This study showed that 74.6% of the male students while 65% of the female students use the phone with weak signal. **Quiring (2008)** stated to take care to the signal bars on the display panel of the cell phone. Fewer bars indicate a weaker signal. A weaker signal indicates the cell phone will bring more power to preserve the connection. In fact, for each bar lost due to poor signal strength the cell phone will increase its power by 1000% to preserve the connection. This study showed that a big percentage of the students are artless of the risk of using mobile phone with weak signal.

CONCLUSION

This study pointed out that the profuse of mobile phones could be one of the aspects that lead to ear disease among medical student. as a deduction , it is certain that using mobile phone is risk premium for health . The study also alluded that using mobile phones abundantly should be avoided, and the society should be acknowledged regularly by the means of mass communication (especially television, newspapers and the internet), and health promotional activities like discussion panels, and publically held presentations.

Recommendation

Cell phones characteristics including absorption rate, electric filed measurement, and the understanding of mobile phones advantages should be covered in future studies. Systematic examination should take using of mobile phones in consideration of being potential contributors of ear problem. The researchers recommend an awerness compaign to be conducted at Taibah University to address the problems of using mobile phones and how to limit them.

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