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Short Communication**The use of mobile phones among students of medical staff****S. Stoilova^a, E.P. Ramova^a, B. Stoilov^b**^aUniversity "St. Clement of Ohrid", High Medical School - Bitola, Republic of Macedonia.^bFirst private European university - Skopje, Republic of Macedonia.

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The purpose of our investigation was to access the level of mobile phone use by students and their daily expository of magnetic and electromagnetic fields (EMF). Material and method. The investigation was done on population of 205 students of the University "St. Clement of Ohrid", High Medical School - Bitola at age 20-25 years. The gender was: female 67% and male 33%. By our population differences of percentage by sex is not significant because the most of students for medical staff are female (nurse, midways). The students are fooling questioner by voluntary activity. Results. 30.5% of students have mobile phone more than 8 years. And 55% are in daily expository of one mobile phone. The most of them (84%) use it 1-2 hours on a day. The most of them (65%) are expository of mobile phone radiation because they carry it in clothes. The most of them (92%) sleep near phone, with turn on 90.3%, they have no health problems (74%, 83%) and 79% of them now about side effects of use mobile phone. Conclusion. It can be concluded adjacent and excessive use of mobile phones among students in healthcare professions. Therefore it is indispensable students to be educated to a higher level of the harmful effects of using mobile phones with such intensity and adjacent to the central nervous system.

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1- Introduction

Radiation from cell phones can possibly cause cancer, according to the World Health Organization. The agency now lists mobile phone use in the same "carcinogenic hazard" category as lead, engine exhaust and chloroform (WHO, 2011). Possible adverse health effects of exposure to: electric, magnetic and electromagnetic fields and especially the question of whether there exists a special vulnerability of children and adolescents is field of interest. The increase use of mobile phone by public is also cited with a wave of contradictory reports about possible health effects, due to the exposure of the users to electromagnetic non-Ionizing radiation (WHO, 2008). The sharp increase in the numbers of users and its penetration to all population has raised concern about possible adverse health effects and particular cancer (Kovvali, 2011). There is some evidence of increase in glioma and acoustic neuroma brain cancer (Rohan, 2008; Khurana et al., 2009; Little et al., 2012) for mobile phone users, but have not been able to draw conclusions for other types of cancers. The most of the experiments are on rats (Baan et al., 2011). The biggest problem we have is that we know most environmental factors take several decades of exposure before we really see the consequences. The International Agency for Research on Cancer has classified in group of 2B (ICNIRP, 2009). The extent of genetic damage in human cells, assessed from various end-points, single-double strand breaks on the DNA and incidence of chromosomal aberrations, publishing in studies during 1990-2011 years. Those researches need genetic labor, but we could not do it. Our condition is that we can do investigation with questionnaire and self-report of interviewed people. The examinational protocol from consulting studies are consisting of: duration of expository and different cell types, expository as continuous wave, frequency of electromagnetic fields, pulsed wave and mobile phone age users and specific absorption rate.

The European Environmental Agency has pushed for more studies, saying cell phones could be as big a public health risk as: asbestos, leaded gasoline and smoking. The head of a prominent cancer-research institute at the University of Pittsburgh sent a memo to all employees urging them to limit cell phone use because of a possible risk of cancer. Children's skulls and scalps are thinner. So the radiation can penetrate deeper into the brain of children and young adults. Their cells are at a dividing faster rate, so the impact of radiation can be much larger. Manufacturers of many popular cell phones already warn consumers to keep their device away from their body and medical experts say there other ways to minimize cell phone radiation. Users can also use the speakerphone function or a wired earpiece to gain some distance. Users can text instead of talk if they want to keep the phone away from their faces.

There are not long term following studies, so the opponent for hypothesis of side effects of mobile phones suggest to not avoid panic and encourage the public to use caution, because there are limitations of the studies on complex subjects related to human health. The discipline of public health may need to evolve strategies for educating the public in an objective, yet effective manner.

A number of studies have investigated the effects of radiofrequency fields on brain electrical activity, cognitive function, sleep, heart rate and blood pressure in volunteers. To date, research does not suggest any consistent evidence of adverse health effects from exposure to radiofrequency fields at levels below those that cause tissue heating. Further, research has not been able to provide support for a causal relationship between exposure to electromagnetic fields and self-reported symptoms, or "electromagnetic hypersensitivity".

Mobile phones are low-powered radiofrequency transmitters, operating at frequencies between 450 and 2700 MHz with peak powers in the range of 0.1-2 W. The handset only transmits power when it is turned on. The power (and hence the radiofrequency exposure to a user) falls off rapidly with increasing distance from the handset. A person using a mobile phone 30-40 cm away from their body - for example when text messaging, accessing the Internet, or using a "hands free" device - will therefore have a much lower exposure to radiofrequency fields than someone holding the handset against their head.

In addition to using "hands-free" devices, which keep mobile phones away from the head and body during phone calls, exposure is also reduced by limiting the number and length of calls. Using the phone in areas of good reception also decreases exposure as it allows the phone to transmit at reduced power. The use of commercial devices for reducing radiofrequency field exposure has not been shown to be effective. Most countries have adopted the precautionary principle as the leading guideline, recommending the use of simple and low-cost safety measures which could substantially reduce exposure to brain and other body organs from mobile phones (IEEE, 2005). The purpose of our investigation was to access the level of mobile phone use by students and their daily expository of electromagnetic fields.

2. Materials and methods

The investigation was done on population of 205 students of the University "St. Clement of Ohrid", High Medical School - Bitola at age 20-25 years. The gender was: female 67% and male 33%. By our population differences of percentage by sex is not significant because the most of students for medical staff are female (nurse, midways). The students are fooling questioner by voluntary activity.

The questioner is consisting of the next questions:

How long have mobile phone in years:	< 2/2/4/6/8/> 8
How many mobile phones use in same time:	1/2/3
How many hours use phone daily:	1/2/4/6/8/> 8
Where you keep your phone:	at clothes/at bag
Is the phone in same room where you sleep?	Yes/No
Do you sleep with turn on phone?	Yes /No
Do you have pain in wrist?	Yes /No
Do you have headache, after long use of phone?	Yes /No
Do you inform about side effects of mobile phone?	Yes /No

3. Results

The data from time of use mobile phone is showing in table 1, for question 4 in table 2 and for questions 5-9 in table 3.

Table 1
Answers from questions 1-3.

Question	< 2	2	4	6	8	> 8
1						
n	4	17	39	43	44	62
%	1.9	8.3	17	21	21.5	30.3
Question	1	2	3			
2						
n	113	75	17			
%	55	37	8			
Question	1	2	4	6	8	> 8
3						
n	110	61	16	11	7	/
%	54	30	8	5	3	/

30.5% of students have mobile phone more than 8 years. And 55% are in daily expository of one mobile phone. The most of them (84%) use it 1-2 hours on a day.

Table 2
Where they carry their phones.

Question 4	In clothes	In bag
n	132	73
%	65	36

The most of them (65%) are expository of mobile phone radiation because they carry it in clothes.

Table 3

Answers from questions 5-9.

Question 5	yes	no
n	188	17
%	92	8
Question 6		
n	185	20
%	90.3	9.7
Question 7		
n	53	152
%	26	74
Question 8		
n	35	170
%	17	83
Question 9		
n	162	43
%	79	21

The most of them (92%) sleep near phone, with turn on 90.3%, they have no health problems (74%, 83%) and 79% of them now about side effects of use mobile phone.

4. Discussion

Based on the survey can be clearly seen that the use of the mobile phones in the student population is excessive in relation to daily use and length of use. It is important to note that the quality of their life is significantly threatened because we live in electrosmog and well-known effects of electromagnetic radiation on the biochemical and physiological processes in the brain tissue [3, 8]. The most of students are expository of mobile phone radiation and the most of them sleep near phone. Inhabitants living nearby mobile phone base stations are the risk for developing neuropsychiatric problems and some changes in the performance of neurobehavioral functions either by facilitation or inhibition (Abdel-Rassoul, 2007; WHO, 2008).

5. Conclusion

It can be concluded adjacent and excessive use of mobile phones among students in healthcare professions. Therefore it is indispensably students to be educated to a higher level of the harmful effects of using mobile phones with such intensity and adjacent to the central nervous system.

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