



PERCEPTIONS AND OPINIONS TOWARDS CELL PHONE USE AS A RISK FACTOR OF BRAIN CANCER AMONG UNIVERSITY STUDENTS IN MALAYSIA

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ABSTRACT

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The worldwide use of cell phones has rapidly increased over the past decades. the increasing use of mobile phones, concern has been raised about the Possible carcinogenic effects as a result of exposure to radiofrequency electromagnetic fields. The objective of this study was to explore the perceptions and opinions towards brain cancer related to cell phone use among university students in Malaysia. The study revealed that the majority of the study participants believe that there is no relationship between brain cancer and hand phone use.

Keywords: perceptions, cell phone, brain cancer, Malaysia

*“While using cell phones
one must take extra
careful precautions, such
as using head set while
calling and sending short
text messages is
advisable”*

SHORT COMMUNICATION

The worldwide use of cell phones has rapidly increased over the past decades¹. According to data from the International Telecommunication Union, the number of worldwide mobile cellular subscribers was 12.2 per 100 inhabitants in 2000 but grew to 49.5 per 100 inhabitants in 2007¹. The growth of mobile communication has been remarkably rapid. According to the International Telecommunication Union, in 1998, there were 318 million mobile phone subscriptions in the world¹. A decade later, in 2008, there was 4.1 billion—out of a world population of 6.7 billion people¹. Mobile phone consumption crosses national and demographic boundaries, with some of the most rapidly-growing use found in newly-developing parts of the world in which conventional landlines (and even running water) are luxuries². The arrival of the cellular phone and its rapid and widespread growth may well be seen in historical context as one of the most significant developments in the fields of communication and in information technology over the past two decades^{1, 2}. The growth has been phenomenal by any standards. In 2003, Rice and Katz³ claimed that there were worldwide more mobile phone subscribers than fixed line subscribers and probably TV owners. By 1999 there were just under 500 million mobile telephones being used worldwide, yet US mobile users alone have increased from 109 million in 2000 to 148.6 million in 2002⁴. Since the introduction of cellular telephone service in the United States in 1984 the number of subscribers has increased substantially every year⁴.

Mobile phones are multifunctional devices. Depending upon the national context (and particular service provider), they may be used for making purchases from vending machines, paying tax bills, inciting rites or accessing mobile news^{2, 4}. However primarily, mobile phones are employed for communication, most often by talking or doing text

of health professionals². When a landline is not possible, the mobile phone has been used to the same benefit². Mobile phones may manage our social interactions, such as arranging events or initiating contact⁵. Some of the benefits of mobile phone can take and make calls at any time and any place⁵. Other benefits of mobile phone usage could be described as more psychological and social than technical or practical⁵. For example, Leung and Wei⁶ have listed seven factors of gratification sought through mobile phone ownership: fashion/status, affection/sociability, relaxation, mobility, immediate access, instrumentality and reassurance. Additionally, according to study of Aoki and Downes⁴, American college students found the main reasons for purchasing a mobile to be safety (for when driving at night), for cost effectiveness, for instant information (e.g., phone numbers), for social interaction with friends and family, and for privacy. The increase in adult mobile phone ownership has been closely shadowed by an increase amongst children and young people⁴.

With the increasing use of mobile phones, concern has been raised about the possible carcinogenic effects as a result of exposure to radiofrequency electromagnetic fields (EMFs) emitted from cellular phones ranging from 800 to 2000 MHz⁹⁻¹¹. Biologic effects of EMFs and the possibility of the development of neoplasm remain unclear⁹⁻¹¹. Carcinogenesis usually takes decades from first exposure to manifest cancer, although shorter latencies have been implicated for promoters and certain types of diseases, e.g. ionising radiation and leukemia¹²⁻¹⁵. The use of cellular telephones is one of several suspected risk factors for brain cancer, although the causes of this disease remain poorly understood¹⁵. Predisposing genetic disorders and prior cranial radiotherapy account for a small percentage of

cases^{12, 15}.

In academic year 2011, we conducted a survey that involved 24 medical science students from School of Medicine, the Management and Science University, Malaysia. Universal sampling was used to conduct focus group discussions. Students were invited to participate in this study; once the student agreed he or she was seated at his/her preferable place in the two focus group discussions. The groups were divided into 2 focus groups; each group consisting of 12 students. The first author of this report was the facilitator for the group discussions.

The main questions were:

- 1) How many hand phones do you use?
- 2) How many hours per day you make/receive call?
- 3) How many total hours you make/receive since you bought your hand phone?
- 4) Is regular use of hand phone cause brain cancer? If "Yes", what is your opinion "Why"? If "No", what is your opinion "Why"?
- 5) What are the precautions should be considered while using hand phone?
- 6) What are the practices that usually you use while using hand phone?

The facilitator asked probing questions and directed the group discussions in which all participated students were given equal time for discussion. The facilitator wrote down the conversation during the discussions. The data obtained were classified into various themes and analyzed manually.

The majority of the study participants were Malays and females. Two focus group discussions, each group consists of 12 students. The majority of the participants reported that they have one hand phone and few of them mentioned that they have two hand phones. The majority of the study participants indicated that they dial and receive calls about one hour per day. The majority of the participants (87.5%) indicated that they believe that there is no relationship between brain cancer

and hand phone use. One of them said "*I have been using hand phone for long time, I still normal. No tumor detected*". However, some of the students were found to believe that hand phone use can cause brain cancer. One of them said "*Hand phone produce radiation strong enough to cause brain cancer*". Regarding the daily practice among the study participants, all of them indicated that they did not use the ear phone. Some of them leave phone on silent mode, use loud speaker or off phone while sleeping.

In a case-control study conducted in Sweden, the risk of brain cancer from using a handheld cellular telephone was investigated and it was found that the risk of brain cancer was unrelated to handheld cellular telephone use¹⁶. Another studies also reported that there were no deaths due to brain cancer in persons who used handheld cellular telephones for longer durations^{17,18}. A multinational case-control study of brain cancer which was carried out in eight countries¹⁹ revealed that in Denmark cellular telephone subscription information was linked to a national death index²⁰.

Several epidemiological studies reported the relationships between the use of cell phones and malignant or benign tumors such as brain tumors, head and neck tumors, non-Hodgkin's lymphoma, and testicular cancer²¹⁻²⁴. The possible explanation may be due to the fact that during calls with cellular or cordless phones, exposure to microwaves occurs mainly in the same area on the side of the head used for calls^{21, 22}. During a phone call about 30% of the microwaves are absorbed by the skin and subcutaneous tissue with highest exposure in the head and neck region, especially the area of the external ear^{21, 22}. An increased risk for brain tumours within this anatomical area has been indicated²¹⁻²⁴.

Although the risks of mobile phone use are still unknown, it has been reported that governments of several countries have guided teenagers to refrain from using cell phone for extended periods

of time, or to prefer hands-free usage which significantly reduces the LIM-Radiation exposure level²⁵ and prevalence of specific central nervous system symptoms such as headaches²⁶. Radiation emitted by phones throughout life. Even though the effects of mobile phone on health are still unknown, adolescents should be aware of the possibility of long term risks^{25, 26}.

Conflict of Interest:

The authors declare that they have no conflict of interest.

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