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Perceptions and Opinions towards Cell Phone use as a Risk Factor of Brain Cancer among University Students

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Abstract

Objective: The objective of this study was to explore the perceptions and opinions towards brain cancer related to cell phone use among university students.

Methodology: This study was conducted among 24 medical science students from Management and Science University (MSU), Shah Alam, Malaysia in the academic year 2010/2011. Universal sampling was used to conduct focus group discussions. This study was approved by the ethics committee of Management and Science University (MSU). Consent was obtained from all participants before the group discussions began. Students were divided into 2 focus groups; each group consisting of 12 students. The facilitator asked probing questions and directed the group discussions in which all participated in the focus group discussions. The students were invited to participate, and two round tables were arranged. Participants were set according to the preference place. The participants asked mainly about if regular use of hand phone cause brain cancer or not and the precautions that should be considered while using hand phone. Finally, what are the practices usually you use while using h/p? There were two groups because the themes have already been saturated, that is, there is no new themes generated if we conduct more focus-group discussions. The data obtained were classified into various themes and analyzed manually.

Results: A total number of 24 medical science students participated in this study. Majority of them were Malays and females. All of the participants reported that they have one cell phone and some of them mentioned that they have two cell phones. Majority of them dial and receive calls about one hour per day and 540 hours per year. The majority of the participants mentioned that there is no relationship between brain cancer and hand phone use.

Conclusion: This study showed that the majority of the university students reported that there is no relationship between brain cancer and hand phone use.

Keywords: Perceptions; Cell phone; Brain cancer; Malaysia

Introduction

The worldwide use of cell phones has rapidly increased over the past decades. 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 2007 [1]. 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 world. A decade later (2008), there were 4.1 billion-out of a world population of 6.7 million people. 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 luxuries. 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. The growth has been phenomenal by any standards and Rice and Katz [2] claim that there are now 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 2002 [3]. Since the introduction of cellular telephone service in the United States in 1984 [4] the number of subscribers has increased substantially every year. By the end of 1999, there were more than 86 million cellular telephone users [5].

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, pointing the way towards Mecca inciting rites [6], or accessing mobile news. But primarily, they are employed for communication, most often by talking or doing text messaging. Access to landline phones has increased the chance of survival during a medical emergency by reducing the response time of health professionals [7]. When a landline is not possible, the mobile phone has been used to the same benefit [7]. Mobile phones may manage our social interactions, such as arranging events or initiating contact [8].

Some of the benefits of mobile phone can take and make calls at any time and any place [9]. Indeed, other benefits of mobile phone usage could be described as more psychological and social than technical or practical. For example, Leung and Wei [10], in Hong Kong, list seven factors of gratification sought through mobile phone ownership: fashion/status, affection/sociability, relaxation, mobility, immediate access, instrumentality and reassurance. Additionally, [3] research with American college students found the main reasons for purchasing a mobile to be safe (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.

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The increase in adult mobile phone ownership has been closely shadowed by an increase amongst children and young people. One study has indicated that by January 2001, half of all 7 to 16-year-olds were mobile owners [11]. Additionally, in 1999, 34% of 16 to 22-year-olds and approximately 28% of 10 to 19-year-olds owned a mobile [3] and by 2001 it was estimated that up to nine in 10 UK secondary school students had a mobile [12].

With the increasing use of mobile phones, concern has been raised about the possible carcinogenic effects as a result of exposure to radiofrequency Electro Magnetic Fields (EMFs) emitted from cellular phones ranging from 800 to 2000 MHZ [13,14] which fall in the microwave spectrum. Although some *in vitro* studies reported the potential effects of high frequency EMFs on cell proliferation and activation of oncogene transcription, [15-17] those biologic effects and mechanisms in developing neoplasm remain unclear. In general 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 leukemia [18-20]. The use of cellular telephones is one of several suspected risk factors for brain cancer, although the causes of this disease remain poorly understood. Predisposing genetic disorders and prior cranial radiotherapy account for a small percentage of cases. There is little evidence that the risk depends on cigarette smoking and alcohol consumption, and inconsistent findings have been reported for various environmental, occupational, and dietary exposures [21,22].

Methodology

This study was conducted in the academic year 2011 among 24 medical science students from School of Medicine, Management and Science University (MSU), Malaysia. Universal sampling was used to conduct focus group discussions. This study was approved by the Research and ethics committee of Management and Science University (MSU). Consent was obtained from all participants before the group discussions began. Students were invited to participate in this study; once the student agreed he was seating at his preferable place in the two focus group discussions. The groups were divided into 2 focus groups; each group consisting of 12 students. The main author was the facilitator for the group discussions. The main questions was 1) How many hand phone(s) 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, in your opinion Why? If No, in your opinion why? 5) What are the precautions that should be considered while using hand phone? 5) What are the practices usually you use while using h/p? The facilitator asked probing questions and directed the group discussions in which all participated in the discussion were given equal time for discussion. The facilitator wrote down the conversation during the discussions. The students were invited to participate, and four round tables were arranged. Participants were set according their preference place. The data obtained were classified into various themes and analyzed manually.

Results

A total number of 24 university students participated in this study. Majority of them were Malays and females. Four 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. Majority of them dial and receive calls about one hour per day and 540 hours lifetime use. The majority of the participants mentioned 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 am still normal. No tumor detected". Some of them 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 did not use the ear phone. Some of them leave phone on silent mode, use loud speaker or off phone while sleeping.

Discussion

In this study, the majority of the participants mentioned that there is no relationship between brain cancer and regular hand phone use. Similar findings suggested that use of handheld cellular telephones is not associated with risk of brain cancer [23]. Furthermore, in preliminary reports of a case-control study conducted in Sweden, the risk of brain cancer was unrelated to using a handheld cellular telephone [24,25]. Another study reported that there were no deaths due to brain cancer in persons who used handheld cellular phones for longer durations. A multinational case-control study of brain cancer has begun in 8 countries, [26] and in Denmark cellular phone subscription information is being linked to a national death index [27].

In this study, some of the participants believe that hand phone use can cause brain cancer. Similarly, 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 cancer [24,23,28-46]. 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. 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. An increased risk for brain tumours within that area has been indicated [47-49]. In a cohort of 255868 cars, handheld, and other cellular telephone users, the standardized mortality rate for brain cancer was 3.7 in persons who used handheld cellular phones for less than 2 minutes per day, compared with 2.0 for car telephone users after 1 year of follow-up based on 2 and 4 deaths, respectively [50]. Although these risks are still scientifically debated [51,52], some studies suggest the existence of risks of brain tumors linked to cellphone use [53].

Regarding the daily practice among the study participants; all of them did not use the ear phone. Some of them leave the phones on silent mode, use loud speaker or switch off phone while sleeping. This showed the poor practice towards brain cancer prevention among study participants. Consequently, governments of several developed 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 level [54] and prevalence of specific central nervous system symptoms such as headaches [55]. Such risks may constitute a definite hazard as current adolescents will become the first generation of people to be exposed to LIM-Radiation emitted by the phones throughout life. Likewise, if adolescents are not aware of the possibility of these long term risks, they should be informed in a timely manner so that they may modify their behavior accordingly.

Conclusion

This study showed that the majority of the university students

reported that there is no relationship between brain cancer and hand phone use.

Recommendation

It is clear that cell phones may represent a danger to health, and users should be educated about the risks and encouraged to limit exposure. Since WHO warning that cell phone is one of the risk factors of brain cancer, precaution is better than cure. Therefore cell Phones Company should look for a fashionable design and easy use for the ear phone to encourage more people to use it. Further quantitative studies are needed to explore the practice among university students.

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