

Effects of Advanced Cell Phone Technology on the Duration of Sleep

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Abstract: Electronic media have often been considered to have negative impact on the sleep of adolescents, but there are no comprehensive research reviews in the area of advanced mobile technology to old ones. The present study identified the investigated relationship between old vs new mobile phones with advanced applications. The variables investigated were delayed bedtime and shorter total sleep time and it has been found to associate with new versions of latest technology mobile phones. A model of mechanisms by which media use may affect sleep is presented and discussed as a vehicle for future research.

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Introduction

The Sleep is a period of rest for body and mind, during which volition and consciousness are in partial or complete abeyance and the bodily functions partially suspended, or in simple words described as a behavioral state marked by a characteristic immobile posture and diminished but readily reversible sensitivity to external stimuli [1]. Young adults need eight to ten hours sleep with some natural variability. Sleep is very important to feel fresh and to improve cognitive functions. Many young adults do not sleep well and that too for shorter duration, due to advent of advance mobile phone technology that has given an easy access to the world renowned applications i.e. face book, twitter, WhatsApp, viber, Instagram, snapchat, kik and a lot more. And not to forget online gaming. Although sleep deprivation among adolescents is not a new phenomenon, but in past few years it has garnered more main stream, clinical, and academic attention. This too comes at time when there are increased demands on young adults (a) that conflict with getting a full night's sleep, which can negatively impact physical, social, and psychological health.

The correlation between health loss and sleep deprivation have been well documented. Physical, sleep disturbance can disrupt because deregulated sleep patterns, eas well as endocrine and immune responses. [2,3] examples include weight gain, insulin resistance, increased cortisol levels, systemic inflammation, hypertension and decreased immune response. [2.4-6]. Sleep disturbance also associated with lapses in attention, delayed response time, and daytime drowsiness [7.9-12]. Psychological sleep disturbance can alter cognitive functions and has been linked to reduced short-term memory, decreased

learning ability, poor productivity and decreased motor performance.

Mood is also significantly affected, as negative mood states, depressive symptoms, decreased stress management, family conflicts, impulsivity and loss of other behavioral, control. [7, 13-15].

Discussion:

The operation of sensitive electronic equipment such as mobile phones particularly advanced mobile phones have been proved to have deleterious effect on health as in fatigue, headache, impairment of short term memory and more significantly on sleep as compared to the old version of mobile phones.[9] Keeping in view the hazards of mobile phones exceptionally mobile phones with advanced applications, the present study was designed to investigate the association of use of mobile phones with sleep disturbance in medical students of LUMHS, Jamshoro Sindh Pakistan and provide a health and social awareness regarding usage advanced application devices. The present study results demonstrated that, the health problems (sleep disturbance) are associated with long term exposure to online applications and social networking websites as face book, twitter and what saap etc; particularly in night hours. The average sleep duration of students who use latest technology advance application cell phones was 5.43 hours at night time and 7.2 hours per day. Whereas the average sleeps duration of students, who used old version of the mobile phones with less application were 6.53 hours per night and 8.3 hours per day. 52.6% of total students have average 2 hours sleep in day time, 40.3% in old version users and 12.3% in advanced version users. Total 39% students were unable to have the required

sleep which is 8 hours a day, 11.7% in old version users and 27.3% in advanced version users. This is the first time that mobile phone hazards especially advanced mobile phones have been addressed and studied on Medical Students of LUMHS Jamshoro Sindh Pakistan. Hermann and Hossmann [10], Hocking [11], reported the adverse effects of advanced mobile phones can cause sleep disturbance, memory problems, headaches, nausea, promote cancer and high blood pressure. The reports of sleep disruption are consistent with the effect of GSM radiation on rapid eye movement (REM) sleep and on melatonin levels [12]. Eulitz et al [13] suggested that mobile phones emit a pulsed high-frequency electromagnetic field (PEMF), which may penetrate the scalp and the skull and shows that these electromagnetic fields alter distinct aspects of the brain's electrical activity (EEG), electrochemistry, permeability of blood brain barrier [14] and to degrade the immune system. Becker and Marini, [15] and Frhlich et al [16] reported that headache is consistent with fact that microwaves are known to non-thermally affect the dopamine-opiate system and this causes headache. Our results are in conformity with these results. The present study also confirms the results observed by Mann and Roschke [17] who investigated the influence of high-frequency electromagnetic field of advanced digital mobile phones on sleep in healthy humans. The number of complaints caused by sleep deprivation was higher in individuals using advanced digital (GSM) system with pulse modulated fields, than for those using the old analogue (NMT) system. Our results correlate with the results observed by sandstorm et al, keeping in view the findings of the present study, our research results are of importance in that they demonstrate the need of taking preventive measures.

Methodology:

The questionnaire was based on cross sectional comparative type of study. The research was carried out in department of Physiology department, of LUMHS, Jamshoro, Sindh, from January 2014 to June 2014 on students of MBBS. The sample consisted of 550 students (n=550; girls 71%; boys 29%; aged 18 to 22 years) were included in study. The data was analyzed on MS excel.

Results:

Except for weekends the average duration of sleep decreases in students who use latest technology advance application mobile phones. The average sleep duration of students who use latest technology advance application cell phones was 5.43 hours at night time and 7.2 hours per day. Whereas the

average sleep duration of students, who used old version of the mobile phones with less applications was 6.53 hours per night and 8.3 hours per day. 52.6% of total students have average 2 hours sleep in day time, 40.3% in old version users and 12.3% in advanced version users. Total 39% students were unable to have the required sleep which is 8 hours a day, 11.7% in old version users and 27.3% in advanced version users. Conclusion: weekday and weekend sleep duration is potentially affected by the use of advanced applications in new version of mobile phones.

Conclusion:

In the present study, we found a strong relationship between sleep disturbance in subjects who used advanced mobile phones as compared to those who used old version of mobile phones. It is advisable therefore; that the use of mobile phones is a risk factor for health hazards and suggest that excessive use of mobile phones should be avoided by health promotion activities, such as group discussion, public presentations and through electronic and print media sources. In addition, we also suggest more research is required to observe the effects of mobile phones with different systems of the human body along with clinical examination.

Pattern and relationships between species diversity and ecosystem functioning are the current areas of great ecological interest throughout the world. Species diversity incorporates two components (Stirling and Wilsey, 2001); evenness (how evenly abundance or biomass is distributed among species) and richness (number of species per unit area). High evenness can increase invasion resistance, below-ground productivity and reduce total extinction rates (Smith et al., 2004). The spatial variations in biodiversity generally include species diversity in relation to size of the area, relationship between local and regional species diversity and diversity along gradients across space, and environmental factors such as latitude, altitude, depth, isolation, moisture and productivity (Gaston, 2000). In addition, species richness of a taxon is not only sufficient to express diversity but the equitability is also an important factor because

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