



HEALTH HAZARDS OF HAND HELD ELECTRONIC DEVICES AMONG YOUNGSTERS.

Pathology

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ABSTRACT

INTRODUCTION: Hand held electronic devices has become a inevitable part of our modern life. These devices has many advanatges along with few side effects. Excessive use of electronic devices causes various health hazards and is associated with obesity and psychological changes
AIM & OBJECTIVES: The aim of our study is to find health complaints among youngsters due to longterm use of hand held electronic devices and to find the association between electronic device usage and stress and obesity.

MATERIALS & METHODS: This prospective study was conducted among a total of 580 medical college students and 300 school children of age group 8-14 years from Tamilnadu. A detailed questionnaire pertaining to the study was given to the students involved in the study. We calculated BMI (Body Mass Index) for all the study subjects. All the results were analysed statistically using SPSS Version 18 package and Chi square test.

RESULTS AND OBSERVATION: We observed that 98.2% of college students and 50.5% of school students were using cellular phones. There is a significant association between chronic mobile use and health hazards ($p < 0.001$). The common health complaints are musculoskeletal pain (42.3%), phantom ringing (10%), head ache (9.2%) and stress (14.5%). We found in our study that 10.8% of college students and 5.2% of school students who use electronic devices excessively were obese ($p < 0.001$).

CONCLUSION: We conclude from our study that excessive use of electronic devices causes many health problems and is associated with obesity probably due to increased stress, sedentary life style, and unhealthy snacking. We intend to create an awareness among the public by publishing this study report.

KEYWORDS:

Electronic devices, health hazards, stress, obesity, psychological changes.

Introduction:

Mobile phones, smart phones, laptops, Ipads, tablets and other hand held electronic devices have become part and parcel of our day to day life. Both college and school students use it for communication and playing games. Mobile industry is rising to the top producing various models and designs frequently. Many controversies exist regarding the health hazards of excessive mobile use. Problems arise when people use it excessively to the level of obsession and addiction. Chronic use may indirectly lead to sedentary life style, unhealthy snacking, increased BMI (Body Mass Index) and obesity.^[1] Obesity is now becoming a major health problem in developing countries like India.^[1] In this study we analysed the detrimental effects of electronic devices on health and life style on youngsters of Kancheepuram district, Tamilnadu.

Aims and objectives:

1. To find the prevalence of usage of electronic devices regarding the number, type, and duration of usage
2. To find the occurrence & types of health hazards due to longterm use of Eds.
3. To calculate the BMI (Body Mass Index) of the study subjects.
4. To find the occurrence of obesity among youth and children
5. To study the association between electronic device usage, stress and obesity

Materials and methods:

This cross sectional study was conducted in a private medical college and 2 schools of Tamilnadu. Duration of the study is between June 2015 - Sep 2015. A total of 580 medical college students (16-20 yrs) and 300 school children (8-15 years) were our study subjects. Informed consent was obtained from the students and school children. Confidentiality of the details was maintained. Institutional ethical committee clearance and scientific research committee clearance was obtained. A detailed questionnaire was given to the students involved in the study. Questionnaire was containing all the items needed for the study along with socioeconomic conditions. Height and weight of the students was also measured to calculate BMI. Formula for calculating BMI is $\text{Weight} / (\text{Height in Metre})^2$. Using BMI, Prevalence of obesity was calculated. All the results were analysed statistically using SPSS Version 18 package to know their

significance. Chi square test was used to check the significance of their association.

Observation and Results:

98.2% of college students and 50.5 % of school students were using cellular phones [Table 1]. They use it for various purposes like communication (46%), socialization (22%), learning & gaining knowledge about recent advances (15%), playing games (10%) and entertainment (5%) [Table 2]. They use it on the average of 4-5 hrs/day. Students who belong to high socioeconomic status and single child of family use mobiles often excessively and abuse it.

69.5% of our study subjects complained of health problems. Following health complaints were lodged by the students associating to the chronic mobile use. Musculoskeletal pain (42.3%), phantom ringing (10%) decrease in concentration ability (6.0%), psychological effects & addiction (2.4%), (1.0%), head ache (9.2%), visual strain (3.5%), stress (14.5%) sleep disturbances (5.4%), accidents (1.0%), decreased academic performance (5.2%) and no adverse effects by 30.5% of the study population [Table 3]. We found that there is a significant association between chronic mobile use and health hazards ($p < 0.001$). Almost all the youth were aware of the radiation hazards of electronic devices.

We measured height and weight of students involved in our study. Then we calculated body mass index by using the formula: $\text{BMI} = \text{Weight} / (\text{Height in Metre})^2$. BMI values < 25 - Normal; BMI 25 - 29.9 - Overweight; BMI > 30 - Obese. Children with BMI equal to or exceeding age gender specific 95th percentile are defined as obese. We found that 10.8% of college students and 5.2% of school students were obese ($p < 0.001$) and they use portable electronic devices extensively. About 20.5% of college students and 16.7% of school students were overweight [Table 4].

Discussion:

Use of electronic devices has been unavoidable and indispensable. In this modern era, most of our youth spend their valuable time using the smart phones, I pads, tablets, laptops, television and computer. Youth is our power and future. They use smart phones for learning, updating themselves about recent advances and also for

entertainment & socialization.^[2] But some students who are addicted to mobiles misuse it excessively. So their health and academic performance deteriorates automatically. Since there are many controversies regarding the health hazards of mobile use. Literature is very less regarding the adverse health effects of mobile, so we have conducted this study among the college and school students of Kancheepuram district of Tamilnadu. This study was undertaken to find out to find the prevalence of usage of electronic devices and occurrence of health hazards. We also calculated the BMI of the study subjects to find the prevalence of obesity among our study population.

American association of pediatrics recommended the children aged 6-18 yrs to use electronic devices only 2 hrs per day. But our study subjects use it 3-4 times the recommended time limit. This habit increased their stress, unhealthy snacking habits and gradually become alcoholic. Chronic mobile use by college students cause a negative effect in well being and cause anxious stressful life. Many researchers have observed that mobile use can cause head ache, impaired concentration, decreased memory, easy fatiguability, eye strain and other health hazards related to sedentary life style and obesity. Khan MM et al., in 2008 observed in their study that 44.4% of chronic mobile users complained of health effects.^[3] In our study 69.5% of our study subjects complained of health effects. In our study adults commonly complain of musculoskeletal pain than the children. Excessive use definitely affect the psychological health causing depression, suicidal tendencies, Sleep deprivation, anxiety, attention deficit, psychotic behavior, aggression, violence, decreased memory and addictions.^{[4],[5]} Thomee S et al., in 2012 found that sleep disturbance and mental health symptoms are more commonly reported by chronic users.^[6]

Al Khalaiwi et al. conducted a similar study and observed that majority of the subjects complained of head ache, sleep disturbance, fatigue and dizziness. He concluded that chronic use is risk and longterm use should be avoided by health promotion activities like group discussion, public presentations and through media.^[7] SH Subba et al., in 2013 observed that 34.6% of chronic mobile users had ringxiety, phantom ringing with a nervousness and irritability.^[8] In our study also 10% complained of phantom ringing. Some people are hypersensitive to mobiles complaining of redness, irritation, itching and headache.^[9]

Of all the complaints, stress is important because it is a contributing factor for obesity, depression, irregular dietary habits, sedentary life style and suicidal tendency. Huesmann RL., et al in 2007 observed that the recent increase in the use of mobile phones can be a venue for aggression and victimizes the youth.^[10] 14.5% of our study population complained of stress. It is a serious public health threat. Stress increases the risk of obesity by stimulating adipocytes. Neuropeptide Y is released during chronic stress. It stimulates the receptors of adipocytes causing proliferation and hypertrophy thus causing obesity. The other mechanism is by secretion of cortisol. Cortisol increases gluconeogenesis, glycogenolysis and alteration in lipid metabolism resulting in insulin resistance and obesity.

Few researchers considered excessive mobile use as a threat to human life and environment. They said that effects of electromagnetic field can be carcinogenic. But it is controversial, as there are no data available to support it. Long time studies and further research is needed to validate this concept. Salama OE et al., in 2004 observed in their study that prevalence of mobile usage was 68%. Health manifestations was reported by 72.5% of the study population.^[11] He concluded that the health consequences of long term mobile phone use was non specific.

Electro magnetic field (non ionizing radiation) produce thermal effects to the organ which is in close contact. They do not cause DNA damage. Schetz J et al in 2006 studied the association between mobile phone and glioma and meningioma.^[12] One study reported a acoustic neuroma in association with electronic device use.^[13] There is a

increasing risk of head tumors induced by long term mobile phone use of atleast 10 years especially gliomas and acoustic neuroma. WHO (IARC) says that exposure to Electro magnetic field (EMF) as possibly carcinogenic but there is only limited evidence in human studies. Therotically speaking, children have the greater risk of brain cancer than adults when chronically exposed to EMF. Shorter conversatio and hands free devices can be used to avoid side effects. Risky behavior with cell phone usage includes use on driving, and talking while charging. Using mobiles during driving will definitely decrease concentrating ability and cause major accidents.

School children has been addicted to playing video games and also have been noted with behavioral changes. Their sedentary life style may cause health problems like coronary heart diseases, type 2 diabetes and obesity in the long run. We found that 51% of school students own mobile phones showing a high prevalence. But the level of usage of electronic device usage is less when compared with college students. Sedentary children who habitually consume snacks while watching television are at higher risk for obesity than who do not. Progressive increase in frequency and duration of outdoor playtime significantly reduced excess weight in obese children by nearly three times than those who do not play.

Gupta S et al in 2009 reported in his study that 17.5% of the UG medical students were overweight and 3.4% of students were obese.^[14] In our study 10.8% of college students and 5.2% of school students were obese. About 20.5% of college students and 16.7% of school students were overweight [Table 4]. Socio economic trends in childhood obesity in India are also emerging. Childhood obesity is a serious public health threat. The major reason for childhood obesity is excessive use of electronic devices and lack of exercise.

Prevalence of obesity among the school children of developing countries is on the rise and is mainly due to electronic devices and sedentary life style. Later they may develop diabetes, early stroke, myocardial infarction, polycystic ovarian disease, decreased life expectancy. In schools mobile should not be allowed during class hours but can be used during free periods and intermissions. Teaching material can be in digital formats for students and made available in their mobiles to improve their performance.

Portable electronic devices can be used to deliver health care services and in promotion of personal health. Since electronic devices has become a vital accessory, it should be used constructively. Scientific society should use these powerful devices in the field of medicine and public health.^[15]

Conclusion:

We conclude that excessive use of electronic devices is strongly associated with obesity (16%) and increased stress (14%). Children spend their time with electronic devices and lead a sedentary life. Many of the chronic users complained of detrimental health effects even to the level of obsession and addiction. A holistic approach from parents, teachers and society is needed to control the use of electronic devices. All the school students and common public should be educated and counselled regarding the adverse effects of excessive use of electronic devices through mass media programmes, by conducting debates, essay competitions, poem writing and skits etc. Youth should be motivated to indulge in regular exercise, sports and yoga. We report this study to create an awareness about the health hazards of excessive use of electronic devices among the public and emphasize its association with stress and obesity.

CONFLICT OF INTEREST - NIL

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TABLES:

Table 1: Prevalence of electronic device usage among college and school students.

s.no	Electronic device usage	College students %	School children %
1	Mobile phones	98.2	50.5
2	Laptops	68.5	10.5
3	I pads	50	5.4

Table 2: Purpose of Usage and its Percentage.

s.no	Major Purpose	Percentage
1	Communication	46%
2	Socialization	22%
3	Learning	15%
4	News	2%
5	Games	10%
6	Entertainment	5%

Table 3: Detrimental effects of chronic electronic device usage.

s.no	Health hazards	% of study population complained
1	Stress	14.5
2	Musculoskeletal pain	42.3
3	Head ache	9.2
4	Phantom Ringing	10
5	Impaired concentration/carelessness	6.0
6	Sleep disturbance	5.6
7	Decreased academic performance	6.0
8	Visual strain	3.5
9	Psychological effects/addiction	2.4

Table 4: Prevalence of obesity among our study subjects.

s.no	Body mass index range BMI = WT/(HT in metre) ²	Grading	Percentage in College students	Percentage in School children
1	<25	Normal	68.7	78.1
2	25.1-29.9	Over weight	20.5	16.7
3	>30	Obese	10.8	5.2
		P VALUE	P<0.001	P<0.001

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