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EXCESS USE OF E- DEVICES AND SLEEP QUALITY; CONCURRENT CONCERN IN YOUNG OBESE ADULTS

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ABSTRACT

Background: The relationship between sleep disturbance and excess use of e-devices in obese is key factor in the emerging research which can be further linked with other chronic and metabolic disorders like cardiovascular diseases, diabetes mellitus. **Objectives:** implement the association between BMI and sleep disturbance in young obese adults in attempt to contrive its associative risk factors with excess use of digital devices. **Methods:** 168 volunteer undergraduates both male and female of age 18-25 years. Were divided into three groups according to the BMI (n=56 each group) Group 1: normal weight or control (BMI; 18.5-24.9 kg / m2), Group 2: Overweight (BMI - 25 kg / m2 - 29.9 kg / m2) and Group 3: obese (BMI - 29.9- 34.9kg / m2). Self-reported information about sleep was collected and assessed by using Sleep Quality Questionnaire(contains 9 components) from each participant over period of 1month. Collected information regarding e-devices usage time before bed mainly during night. **Results:** Self reported information from each participant was that, most of the students were indulged in using Online apps, movies and chatting with friends or family. . 7% of students have reported that they have severe sleep dysfunction. 31% of the students have reported about some sleep problems. It indicates negative correlation between sleep quality and obesity (depending upon BMI). **Conclusion:** The study underscores the relation between obesity and sleep quality which predisposes to adverse metabolic complication like diabetes mellitus,cardiovascular diseases and autonomic malfunctions. Mindful lifestyle and regular physical activity can enhance the welbeing of youth generation.

INTRODUCTION

Obesity is now common within the world's population that it is threatening global well being as the most important hand to ill health[1].

The World Health Organization has defined obesity as a disease[2]. Obesity is the result of imbalance between food intake and energy expenditure[3].Obese Individuals with excess fat in the abdominal depots are at risk of adverse health like CHD, Type II diabetes, atherosclerosis and hypertension[4]. Most recently, there is an emerging concern that obesity is associated with decreased sleep duration among younger generation. It is being observed that these young minds are greatly influenced by e-gadgets, like laptops, smart phones, music devices. High frequency Internet and easy availability of these devices have increased dependency and addiction among youth. Excess screen usage and continuous emission of beaming light can cause fatigue, irritability, less sleep. Although, these devices provide wide range of information to the students but popularly replacing traditional method of text books reading. More indulgence is affecting day to day physical activities, increased sedentary life. Late night usage of such devices may affect CNS; less secretion of melatonin which may disturb Sleep/ wake cycle as well as weight maintenance[5]. It is clear fact that adequate sleep is very essential for health of the entire body. Good sleep counts for both quality and quantity. Poor quality may impact on alertness, attentiveness, intellectual ability including memory lead to decline in academic performances. Furthermore, other associated concerns are like sleep disturbances, insomnia, Sleep Apnea and restless leg syndrome may result in decrease in duration and quality of sleep in overweight and obese people[6].

Therefore in the present study we will use anthropometric parameters like BMI, WC to asses overweight and obesity. Among these parameters, BMI reasonably estimates adiposity

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as well as allows classification of overweight and obesity despite of its being crude measure[7].

The relationship between sleep disturbance and excess use of e-devices in obese is key factor in the emerging research which can be further linked with other chronic and metabolic disorders like cardiovascular diseases, diabetes mellitus etc. Hence this study is to implement the association between BMI and sleep disturbance in young obese adults in attempt to contrive its associative risk factors with excess use of digital devices. By understanding this link we may develop some effective interventions or life style modifications for obese having sleep disturbances.

MATERIALS AND METHOD

The present study is cross-sectional study. The study was conducted on 168 volunteer undergraduates both male and female of age 18-25 years. After explaining details of the study, Informed consent was obtained from each of the subject. Ethical clearance was obtained.

Study participants were divided into three groups according to the BMI (n=56 each group) Group 1: normal weight or control (BMI; 18.5-24.9 kg / m2), Group 2: Overweight (BMI - 25 kg / m2 - 29.9 kg / m2) and Group 3: obese (BMI - 29.9- 34.9kg / m2)[8].

a) Inclusion criteria: Apparently healthy students of MBBS first year were included in the study.

b) Exclusion Criteria: Subjects with any type of congenital heart diseases, endocrine disorders, chronic diseases, respiratory tract infection, allergy etc were excluded from the study.

All the parameters were recorded in the departmental laboratory between 8 to 10 am. Anthropometric parameters like height (cm), weight (Kg), WC were recorded. BMI were calculated for each participant (Kg/m^2). Systolic and Diastolic blood pressure were recorded by using Diamond Mercury sphygmomanometer using auscultatory method. Self-reported information about sleep was collected and assessed by using Sleep Quality Questionnaire from each participant over period of 1month.This sleep quality questionnaire comprises 9 components and informs about various aspects about sleep like duration of sleep, Sleep latency,early waking, insufficient sleep, poor concentration,irritation. 9 components scores were added together to rate the quality of sleep. It ranges from 0 to 36 ; in the grades of poor quality, good shape sleep, great shape sleep[9]. Also collected information regarding e-devices usage time before bed mainly during night.

Statistical analysis: SPSS software version 16 was used to analyze the data. The values were displayed in terms of mean±SD. The pearson's correlation was applied to show the correlation between the parameters.

RESULT

The study included around 168 students, all of them were hostel residents. All students were from the Medical college. Almost of them were using the smartphones, laptops or tablets and other e devices over a long period.

The table 1 result depicts the comparison of various anthropometric and physiological parameters in all the three groups. These groups were made according to the BMI of the participants.Group1 (BMI; 18.5-24.9 kg / m2), Group 2: Overweight (BMI - 25 kg / m2 - 29.9 kg / m2) and Group 3: obese (BMI - 29.9- 34.9kg / m2). The values in the group 2 and 3 are higher than the group 1. WC, SBP and DBP have shown higher values in group 2 and 3 than the group 1. However, the sleep quality rate is seen to be decreased in group 3 and 2 participants than the group 1.

Table 1. Anthropometric and physiological parameters of 3 groups

Parameters	Group 1	Group 2	Group 3	T test(p value)
WC cm	81.4 ± 7.16	87.29 ±11.68	93±16.63	**
BMI kg/m^2	21.02 ± 2.24	26.43 ±1.15	32.23±2.73	**
SBP mmHg	116.4 ± 8.48	118 ± 8.68	120±6.72	
DBP mmHg	76.6 ± 6.6	79.2 ± 6.6	80±6.92	
Sleep quality rate	26.3 ± 5.15	24.68 ± 6.1	20±5.5	**

Data presented in mean±SD, p*≤ 0.05

Table 2. Percentage distribution of participants depending upon their gadget usage at bedtime.

Night time usage of gadgets	Occasionally	Frequently	Very frequently
Silencing the phone before sleep	18(48%)	13(35%)	6(16%)
<30mns before sleep	20(22%)	28(32%)	39(44%)
60mns before sleep	9(31%)	5(17%)	15(51%)
>60mns before sleep	17(43%)	11(25%)	15(43%)

Table 2 depicts the percentage distribution of participants depending upon their gadgets usage at bedtime. 48% of students have reported that they keep the phone on silence mode before sleep occasionally. Only 16% students follow this practice which is quite a less number. Majority of the students (44%) of the students reported that they use smart phone or tablets very frequently for 30mins before bed. Most of the students spent time more than 60mins regularly on using e-devices. Self reported information from each participant was that, most of the students were indulged in using online apps, movies and chatting with friends or family.

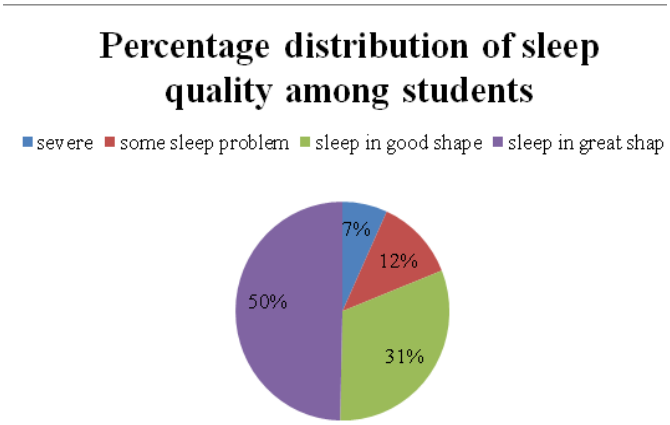

Fig1. Depicts the percentage distribution of sleep quality among students. Self reported information was collected from the sleep quality quesstionaire which comprises 9 components and informs about various aspects about sleep like duration of sleep,sleep latency,early waking, insufficient sleep, poor concentration,irritation. 7% of students have reported that they have severe sleep dysfunction. 31% of the students have reported about some sleep problems. Most of them have a good quality of sleep.

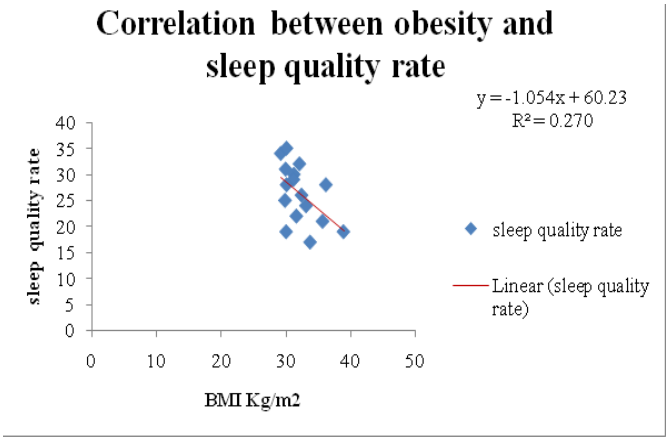

Fig 2. Shows correlation between obesity and sleep quality rate. It indicates negative correlation between sleep quality and obesity (depending upon BMI)

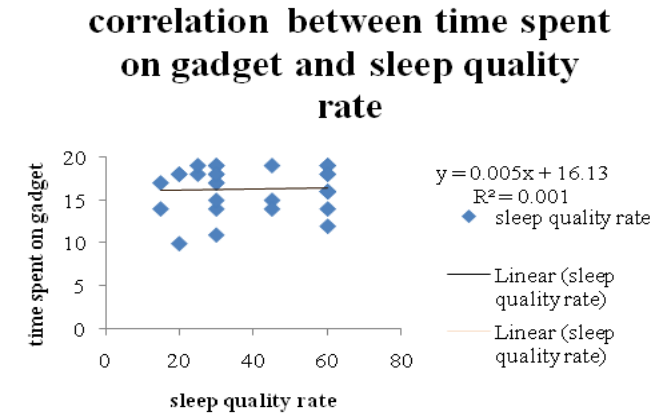

Fig 3. Shows correlation between time spent on gadgets and sleep quality rate. It indicates there is a non significant but positive correlation between time spent on gadgets and sleep quality rate. This indicates that the duration of gadgets usage must have impacted on the sleep quality of the students.

DISCUSSION

The present study mainly emphasize on the concomittant association between sleep quality and quality of life style among young obese. No doubt, results of the study have indicated that sleep quality do get affected with sedentary life style, wakefullness before bedtime. This Association was more significantly observed among obese young adults. The average age of participant was around 21.5± 2.2. This age group students are mainly under the pressure of academic performances, peer pressure, surrounding culture. They easily tend to spend more time by prolonged sitting. This association was more significantly observed among obese young adults. It is because the screen time holds the students to sit prolonged time at one place without doing any physical activity. The basic physiological parameters like WC, SBP and DBP have shown higher values in group 2 and group 3 participants. Whereas sleep quality has depicted decrease in group 3 and group 2 participants. It must be observed as a serious impact on the well-being and health of young generation.

The present study found that 7% of students have severe sleep problem and 31% students have noted that they have a great shape of sleep. 39% of students have reported using of electronic gadgets befor sleep (30mins before sleep) more frequently. Few students have reported that they keep devices more oftenly aside 1 hour before going to bed. 6% of students have mentioned they most frequently switch off the devices before bed. The above information brings to notice that, it is very difficult to manage and control the device usage time, and adequate sleep time. This indicate late night waking and very few hours of disturbed sleep. The study result corroborates with the other study[10].

The study result reports a significant negative correlation between night time gadget use and sleep quality. This must have impacted on sleep-wakefulness cycle of the students. Latenight usage of electronic gadgets like smartphone, laptops affected sleep quality. Student's personal information revealed about lethargy, sluggishness and tiredness due to less sleep or deprived sleep. Student also showed lack of interest in physical activity, or any kind of regular activity. It might have affected their metabolic rate , irregular eating habits. The study result also signifies on the negative correlation between sleep quality and body weight (overweight and obesity). The pathophysiological effect can be that it may affect hypothalamo-pituitary axis and less secretion of melatonin which may disturb Sleep/wake cycle as well as weight maintenance[5]. Sound and adequate sleep is must for the healthy mind and body.

It is difficult to ascertain clearly whether sleep disturbance contributing to obesity or obesity contributing to the sleep disturbance. The study underscores the relation between obesity and sleep quality which predisposes to adverse metabolic complication like diabetes mellitus,cardiovascular diseases and autonomic malfunctions[11]. Sleep quality and obesity in young adults is really a growing concern within the purview of physical and academic aspect. Adopting a physically active lifestyle can be a key intervention for the obesity related sleep disturbance. This can be a cause- effect solution to improve quality of life and reduced risk for the chronic conditions

associated with disturbed sleep in obese.

CONCLUSION

The relationship between sleep disturbance, excessive usage of e-devices and obesity among young adults is key factor in the emerging research which can be further linked with other chronic and metabolic disorders like cardiovascular diseases, diabetes mellitus etc. This challenge must be addressed throught the younger population in terms of their academic and personal growth. Mindful lifestyle and regular physical activity can enhance the wellbeing of youth generation.

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