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Sleep Disturbances, Blood Glucose and Body Mass Index Variations in Overnight Mobile Phone Users

Anumol K, Mary Shalu Jose, Dr. J K Mukkadan
Department Of Physiology
LIMSAR- Under KUHS
Angamaly, India

Abstract:- The usage of mobile phones among the youngsters became a matter of concern in the present era. The mode of usage in a continuous, habitual manner causes them to be detached of real world. They are less concerned about their academics, health and all. The current study was undertaken to compare the sleep pattern disturbances, blood glucose and Body mass Index (BMI) variations in students with overnight mobile phone usage and controlled mobile phone usage. The study groups comprise 30 samples per each group and the samples were examined for four consecutive months. The sleep pattern, Blood glucose and Body Mass Index are were assessed and the data were collected at the end of each month. The data analysis was done by using the SPSS (Version 16.0). Our study results showed that overnight mobile phone users have significant sleep pattern disturbances and most of them became fatty due to lack of activities, majority of the students were having high blood glucose values while comparing with the controlled users. Hence the study gives a valid basis to have an outlook over the probable future health threats such as sleep disorders and related hyperglycemic complications among the youth.

Keywords: *- Mobile Phone usage, Sleep pattern, Blood Glucose, Body Mass Index.*

I. INTRODUCTION

Over use of mobile phones always have the negative impact on health.[1]Now a days youngsters are developing psychological dependency towards mobile phones.[2] Sleep is a crucial aspect for healthy cognitive and physical functioning .[3]It has an indispensable role in different aspects of life and it contributes to our health and well-being.[4] As mentioned, mobile phone usage have a wide connection with sleep disorders.[5] Sleep loss can attributed to several metabolic changes in human body.[6] But the extent to which the usage is incorporated with the adverse effects in terms of sleep pattern and physiological variables like Blood glucose and Body Mass Index are yet unknown. Thus we undertook this study to compare the effects on sleep pattern, Blood glucose and Body Mass Index among students with overnight mobile usage.

II. MATERIALS AND METHODS

This comparative study was conducted in the students of Little Flower Institute of Medical Science and Research, Angamaly. After obtaining the institutional ethical clearance, the student population of about 300 aged between 18 to 25 years were screened using questionnaire (consisting of demographic details, Problematic Mobile Phone Use scale and details regarding pattern of usage; hours, night usage, purpose etc). Based on the scores obtained, the samples were assigned into two different groups randomly; the overnight users and the controlled users. Thus 30 samples per each group have been recruited. After obtaining an informed written consent from the students, the sleep pattern, Body Mass Index and blood glucose variations were assessed for four consecutive months.

- *Assessment of sleep disturbances by Pittsburgh Sleep Quality Index-PSQI*

Pittsburgh sleep quality questionnaire was used as a utilized as a standard instrument to evaluate the sleep quality and sleep duration in students. It is generally used as a 19-item self-rated scale with seven sub-scales estimating subjective experience of quality and patterns of sleep over the earlier month. The seven domains are "subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, daytime dysfunction". Self rated measures from all the domains are consolidating to yield a global score of sleep quality as 21. In each section, the scores changes from 0 to 3 and the absolute score of questionnaire varied as 0 to 21.The client will self report each of these sections. The higher scores demonstrate the worse sleep.[7]

The Body Mass Index (BMI) was assessed by checking anthropometric measurements and Random blood glucose level was measured by using an Electronic Glucometer (SUGARCHEK TD-4207). The data were collected at the end of each month and data analysis was done by using the SPSS (Version 16.0.)

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III. RESULTS

A. Assessment of Sleep Pattern

Both the controlled and overnight mobile phone users were assessed for sleep pattern quality and duration. Results showed significant difference among overnight usage group when compared with control group.

PQSI score was higher in the overnight mobile user group. 83.3% of the controlled mobile users were having good sleep where as almost all the students in the overnight mobile usage group were having poor sleep. The differences among these two groups were showed to be statistically significant with a P value of 0.020 as shown in table 1 and figure 1.

Pittsburgh Sleep Quality Index (PSQI) Scores	Controlled Mobile phone users (N=30)	Overnight mobile phone users (N=30)	Chi square analysis
PSQI (Mean ± S.D)	8.0 ± 2.4	15.6 ± 2.0	P value of 0.020

Table 1:- Comparison of PSQI scores among Students

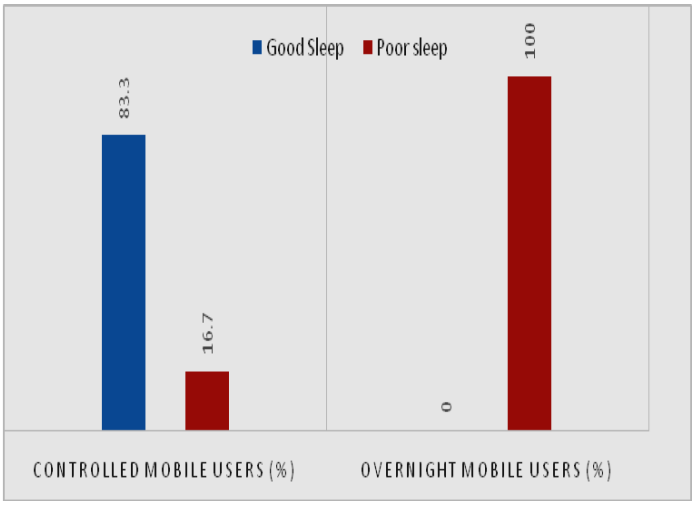

Fig 1:- Comparison of Sleep among controlled and overnight mobile phone users

B. Assessment of Physiological variations

➢ *Body Mass Index*

Anthropometric measurements among the two groups were similar, with BMI being slightly higher in the overnight mobile users group which is not statistically significant (p value 0.611). Overweight and obese were higher in the overnight mobile users group (p value <0.001***)*** compared to the controlled user group as depicted in table 2, 3 and figure 2, 3.

Body Mass Index	Controlled mobile users (N=30)	Overnight mobile users (N=30)	ANOVA test
Height(m) (Mean± S.D)	1.56 ± 0.05	1.56 ± 0.05	p value 1.000
Weight (kg) (Mean ± S.D)	59.6 ± 29.2	62.5 ± 4.9	P value 0.567
BMI (Kg/m^2) (Mean ± S.D)	24.4 ± 12.1	25.5 ± 1.2	P value 0.611

Table 2:- Assessment of Body Mass Index in Students

BMI Classification	N (%)	N (%)	Fischer's Exact test
Normal	28 (93.3)	09 (30.0)	
Overweight	00 (0.0)	20 (66.7)	
Obese	02 (6.7)	01 (3.3)	P value <0.001

Table 3:- Body Mass Index Classification

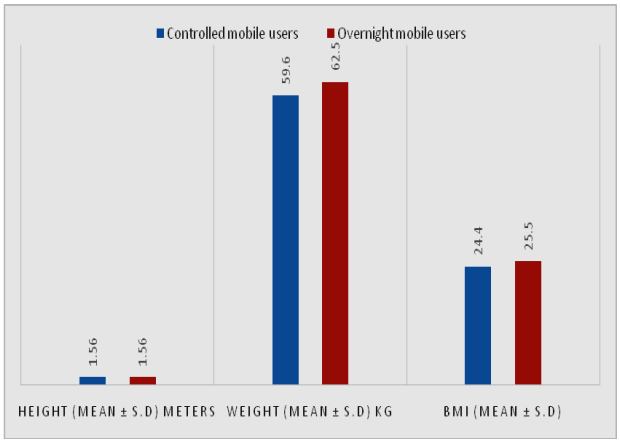

Fig 2:- Assessment of Body mass Index among the students

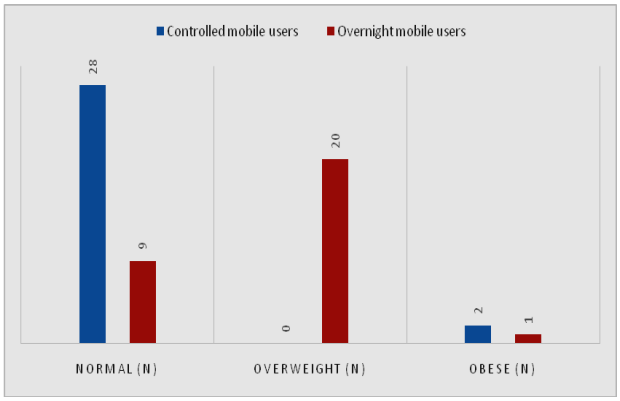

Fig 3:- Body mass Index classification among two groups

➢ *Blood Glucose Level*

Random blood glucose (RBS) levels among students shown to have a comparable difference among the two different groups. The overnight mobile user group shows higher blood glucose level compared to controlled user group (P value<0.001).

Random Blood Glucose (RBS) levels (mg/dl)	Controlled mobile users (N=30)	Overnight mobile users (N=30)	ANOVA test
BG levels (Mean ± S.D)	83.0 ± 9.5	117.8 ± 7.9	P value<0.001

Table 4:- Assessment of Blood Glucose Level in Students

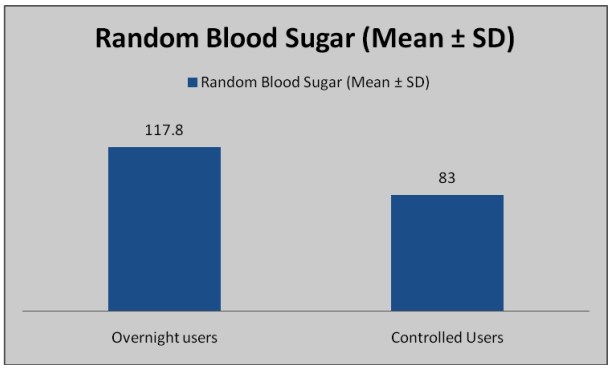

Fig 4:- Assessment of Random blood sugar level among the two groups

IV. DISCUSSION

So far many studies have been conducted on effects of mobile phone usage. But, the need of present study was emerged on a point of view that, the usage rate and dependence are increasing year by year, hence the ill effects too.

In 2015, Shobha and Deepali have conducted a study in a group of medical students to know the effect of mobile usage on sleep quality and day time sleepiness. The results showed that students with mobile phone usage more than two hours shows poor sleep quality and increased day time sleepiness.[1]

Mobile phone usage after lights out shown significant relation with sleep pattern disturbances in a study conducted among Japanese adolescents.[10]

Our study also validated the content that over usage and overnight usage causes much sleep deprivation in students with the help of PSQI tool (P value of 0.020).

No study yet worked on blood glucose level variations among mobile phone users. In our study, the blood glucose levels were found to be high in overnight mobile phone users (P value<0.001) showing a possible threat to have hyperglycemic complications in future.

Thus our study figure out and validate the fact that mobile phone use has detrimental effects on one's own health.

V. CONCLUSION

According to our study findings, the overnight mobile phone users have significant sleep pattern disturbances and related physiological problems while comparing with the controlled users. The students with overnight mobile phone usage were reported of having disturbed and poor sleep quality. Most of them became fatty due to lack of activities, and are tired almost all the time. Majority of them were having high blood glucose levels comparing with controlled users. Thus, the study gives a valid basis for the probable future health threats like sleep disorders, overweight problems, and hyperglycemic complications, among similar youth who uses mobile phone in an uncontrolled manner during the night time.

RECOMMENDATION

The inference of present study findings emphasize and recommend further research on possible health threats of overnight mobile phone usage, so that the people especially teens and youth can be made aware about it with scientific evidence.

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