

## ROLE OF ENVIRONMENTAL FACTORS ON SLEEP PATTERNS OF DIFFERENT AGE GROUPS: A SURVEY-BASED STUDY

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### ABSTRACT

**Objective:** The objective of the study is to determine the effect of various environmental factors associated with modern lifestyle on sleep patterns of three different age groups through a survey-based study.

**Methods:** This was a survey-based cross sectional study. A questionnaire which included questions about their lifestyle habits such as caffeine consumption, electronic media or gadget usage, bedtime, and wake up time was distributed to people of different ages who were grouped into three age groups. The data collected were then analyzed statistically.

**Results:** Most of the habits of today's sedentary lifestyle such as excessive stimulant consumption and extensive late night usage of electronic media and gadgets have a negative impact on both quality and quantity of sleep. People with such habits tend to have a very short and disturbed sleep. From the current study, it is clearly evident that the group which is most affected are the adolescents.

**Conclusion:** Awareness regarding the ill effects of these modern day lifestyle factors would help everyone to minimize the adverse effects of these factors on sleep and aid in adopting a healthy lifestyle.

**Keywords:** Sleep patterns, Factors, Environmental factors, Caffeine consumption, Electronic media.

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### INTRODUCTION

Sleep is quintessential in our lives. Sleep promotes a healthy brain functioning and emotional well-being. Sleep, in general have numerous functions in the body such as enhancing safety and alertness when performing different tasks, maintains healthy balance of hormones, plays a crucial role in fertility and puberty, improves the immune system. Sleep deprivation will have adverse effects on all these functions and lead to an unhealthy life.

According to medical study, newborns should sleep for 16-18 hrs each day; preschool-and school-aged children should sleep for 11-12 hrs and 10 hrs per day, respectively. Adolescents should spend 9-10 hrs a day sleeping and adults should sleep for 7-8 hrs every day [1]. However, in the modern day scenario with increased attractive social and media distractors available all day long, majority of them are sleep deprived [2].

Some of the major reasons of sleep deprivation would be excessive stimulant or caffeine consumption, stressful lifestyle, extensive usage of gadgets and electronic media, which results in either late bedtime or disturbed sleep.

This study aims at exploring how the environmental factors commonly associated with modern lifestyle (electronic media use and stimulant consumption) affect the sleep patterns of different age groups.

### METHODS

This was a survey-based cross-sectional study. The survey questionnaire was prepared with references from the sleep habits survey questionnaire. The questionnaire was then distributed to three different age groups (Group 1 - 15-30 years, Group 2 - 30-45 years, Group 3 - 45-60 years) to evaluate their sleep patterns.

The survey basically consisted of questions that enquired them about their wake up and bedtime, hours of sleep, time taken for them to sleep, caffeine consumption, and the activities in which they get involved before going to sleep. The study was conducted with a sample size of 60 with 20 in each age group, in order to gather sufficient information regarding their sleep patterns. The data collected was then analyzed statistically.

### RESULTS

The data collected from the surveyed were then statistically analyzed and have been presented in the form of tables and graphs.

The mean bed time and wake up time of all three groups have been clearly presented in Table 1.

From the data, it can be interpreted that Group 1 tend to have a late bedtime, both on weekends as well as weekdays which may be due to various reasons such as late night usage of electronic media (television, technically advanced mobile phones, and gaming consoles).

From the mean values, it can also be calculated that they have the least number of hours of sleep. The mean bedtime of Group 3 is 21.10 hrs, 21.32 hrs on weekdays and weekends, respectively, which is quite early when compared to the other two groups, but however their wake up time is also early on both weekends and weekdays. When it comes to mean wake up time, the wake up time of Group 1 population is quite early due to various commitments such as extra classes. However, the wake up time of Group 1 population is quite late on weekends when compared to the other two groups.

The average number of hours of sleep each group is clearly outlined in Fig. 1. From the graph, it is clear that the people of Group 1 (15-30), have the least amount of sleep every day. The population of Group 1 receives only 5.95 hrs of sleep, whereas they require about 9 hrs of

sleep to function at his or her best. Group 2 and Group 3 receives 7.025 and 7.475 hrs of sleep every day, respectively, whereas they require about 8 hrs of sleep to lead a healthy lifestyle. All the three population lack the sufficient quantity of sleep with Group 1 lagging behind poorly.

Fig. 2 clearly explains the various activities they get involved in just before half an hour before they go to sleep. The graph shows that 80% of the Group 1 population spent their time on phone and gaming just before going to sleep and the rest 20% watched television.

Majority (50%) of the Groups 2 and 3 population were found to watch television just before going to sleep. Group 1 population who were found to spend most of their time on mobiles, gaming, and television were the ones who had the least number of hours of sleep.

Caffeine consumption pattern of different groups have been clearly explained in Table 2. The maximum amount of caffeine consumption is among Group 2 which may be due to their working lifestyle and the stress involved in the work, whereas the caffeine consumption of Group 3 is less which maybe associated to various health disorders and their restricted diet. There is no clear majority in Group 1 regarding caffeine consumption, as their preferences and habits are variable. Even though there is a huge difference in the caffeine consumption pattern, it is found to have a major impact on sleep patterns of the individuals.

From Table 3, it is clearly evident that majority of the people in the age group 15-30 and 30-45 feel that their sleep quality is fairly bad, whereas majority of the people in age group 45-60 believe that their sleep quality is fairly good while only 10% among the entire group feel that their sleep is completely disturbed but this may be due to various disorders of old age and their health condition and may not be associated with the effect of external lifestyle factors.

**DISCUSSION**

Sleep plays a very vital role in an individual's life and is a major constituent of a healthy lifestyle. With globalization spreading rapidly in all directions, with the introduction of technology and the stressful life which people are combating every day, the importance of sleep has been ignored.

In this study, we have examined the role of modern day lifestyle factors on sleep patterns and quality of different age groups. We report two

key findings. First, similar to the previous researches, people of all age groups receive less than recommended hours of sleep. Second, stimulant consumption and usage of electronic media such as television, mobile phones, tablets, tend to have negative impact on sleep quality irrespective of the age groups, but the most affected population were the adolescents as they were predominant users of electronic media among the other age groups.

The population of Group 1 receives only 5.95 hrs of sleep, Groups 2 and 3 receives 7.025 and 7.475 hrs of sleep every day, respectively, which is very much below the sufficient number of hours. These findings are in line with the previous reports of an increasing sleep debt problem in adolescents (Wolfson and Carskadon, 1998) [2,3].

We examined various lifestyle factors of modern day people, which affected their sleep quality and quantity in a negative manner.

The introduction of television sets, mobile phones, laptops, and tablets into the bedroom found to have a major negative impact on the sleep patterns and is considered as a vital cause for sleep debt observed in all age groups. For instance, Adam *et al.* (2007) reported that excessive media consumption before bedtime leads to delayed sleep onset [4]. Similarly, Dworak *et al.* (2007) reported that television and video use before bed negatively impacts on sleep quality [2,5].

Our current study also shows a very similar result as Group 1 population who were found to spend most of their time on mobiles, gaming and television were the ones who had the least number of hours of sleep and later bedtimes. This finding is in line with previous study done by Shochat

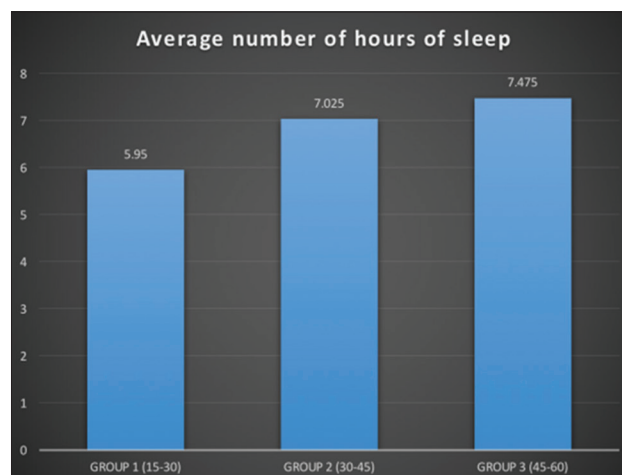


Fig. 1: Average number of hours of sleep

Table 1: Mean of sleep measures of different groups

	Mean Group 1 (hrs)	Mean Group 2 (hrs)	Mean Group 3 (hrs)
Bed time weekdays	23.08	22.02	21.10
Wake up weekdays	5.29	6.34	5.54
Bed time weekends	23.46	22.44	21.32
Wake up weekends	7.43	7.2	6.27

Table 2: Caffeine consumption

Caffeine consumption	Group 1 (%)	Group 2 (%)	Group 3 (%)
Yes	55	65	60
No	45	35	40

Table 3: Quality of sleep

Quality of sleep	Group 1 (15-30) (%)	Group 2 (30-45) (%)	Group 3 (45-60) (%)
Very good	5	5	20
Fairly good	40	40	50
Fairly bad	55	50	20
Very bad	0	5	10

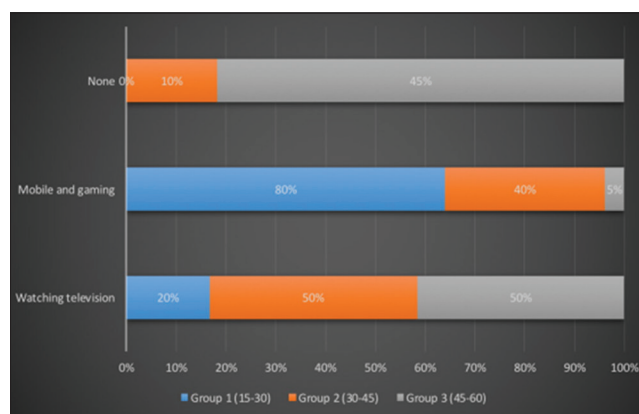


Fig. 2: Activities people do before going to sleep

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*et al.*, 2010 which suggest that the extensive usage of electronic media has a negative effect on adolescent sleep patterns [2,6]. Higuchi *et al.*, 2005, Wood *et al.*, 2006 also reported that the bright light emitted from mobile and television screens, the electromagnetic radiation from tablets and more advanced mobile telephones, may serve to suppress melatonin levels, the hormone responsible for readying the body for sleep [2,7,8].

The consumption of stimulants, such as caffeine, has also been associated with reduced quality and quantity of sleep (Johnson *et al.*, 2006; Lohsoonthorn *et al.*, 2013) [9,10]. Similarly, Wright *et al.*, 1997, reported that people who consume higher quantities of caffeinated drinks are twice as likely to experience sleep problems, both in terms of quality and quantity [2,11]. Similar results have been obtained in this research, where people who consumed stimulants before sleep, tend to have later bedtime and disturbed sleep, irrespective of the age group.

Finally when enquired about the quality of sleep, majority of adolescents and people in their twenties report that they have a very disturbed sleep when compared to the other age groups, this may be due to the extensive usage of electronic media, stimulant consumption, and their stressful lifestyle. Even though some of them have reported that they experience very disturbed sleep in Group 3, it may be primarily due to their health issues rather than due to the effect of lifestyle factors.

### CONCLUSION

Most of the habits of today's sedentary lifestyle such as excessive stimulant consumption and extensive usage of electronic media and gadgets have a negative impact on both quality and quantity of sleep.

In conclusion, we suggest that awareness about the negative effects of stimulant consumption and late night electronic media usage on sleep quality is crucial in today's fast moving world. Knowing the ill effects of these modern day lifestyle factors would help everyone to minimize the adverse effects of these factors on sleep and aid in adopting a healthy lifestyle.

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