

## The Impact of the Use of Electronic and Digital Devices before Bedtime on Sleep Sufficiency among Iraqi Young People

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### ABSTRACT

**Introduction:** Young people often rely on electronic and digital media devices to accomplish many of their daily tasks, which may interfere with their daily physical activities. This study aims to find out the relationship between the use of electronic and digital devices before bedtime and sleep sufficiency among Iraqi young people.

**Methods:** This was an analytical, cross-sectional study that was conducted on 383 young adults aged 18-25 years attending in Al-Tahrir Primary Health Care Center for immunization through purposive sampling technique from September 15, 2019 to January 10, 2020. The tool was a researcher-made questionnaire. The SPSS 20 was used for statistical analysis, where the t-test was used to find a possible relationship between the variables. The descriptive statistics included frequency, percentage, means and standard deviation, independent sample T-test was used to find a possible relationship between the variables. All statistical analysis was conducted in SPSS software version 20 with considering significant level of 5%.

**Results:** Mean (SD) use of electronic or digital devices at night in terms of watching television, using play station, using computer, using cell phone for gaming, and using mobile for the Internet [2.8 (3.48), 1.20 (2.0), 2.13 (3.16), 5.37 (5.0) and 10.90 (6.08)] respectively. As a result, there was a significant difference regarding the use of the cell phone for games (P-value= 0.011) and for social media (P-value= 0.000). The mean use of cell phone per night was statistically higher (20.38 minutes) than those who reported having sufficient hours of sleep (10.38 minutes) (P-value=0.040). The study also observed that the mean number of cell phone calls (5.16) was statistically associated with inadequate sleep hours per night (P-value=0.022).

**Conclusions:** This study found that most participants reported adequate sleep hours after electronic or digital devices were turned off. This is because the increase in the mean number of calls and the minutes during calls before going to sleep was significantly associated with a lack of sleep.

**Keywords:** Sleep Insufficiency, Calls Duration, Electronic Devices, Digital Devices.

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## Introduction

Young adults often rely on electronic and digital devices to for their daily tasks. This may reduce their daily physical activities (1). Recent studies in Japan, Turkey and Iran have shown that sitting in front of digital device screens, including cell phones, affects sleep quality (2). Sleep is one of the basic needs of a person in his/her life because it constitutes one third of an individual's day. This is due to the fact that sleep tries to regenerate the cells of the body and brain (2). Experts recommend that young adults should get 7-9 hours of sleep per night to enjoy good health (3). Since it is not known how many hours the youngest people spend on the screen of available digital devices, parents should restrict their use to 30 minutes a day, followed by a reduction of 5 minutes a day during the month. Thus, the overall daily use of digital devices would not exceed 90 minutes per day (4). The number of households accessing computers doubled from 1998 to 2008. This number increased by five in households accessing mobile phones during the same period (5). It allows access to many actions that require the use of the Internet, social media and playing games. Accordingly, the likelihood of exposure to negative health effects such as headaches would increase (6). Nowadays, in line with the modern world, parents and educators face educational challenges as a teenager transitions into adulthood. They include elements such as being under the control of many choices and decisions (7). Many studies have demonstrated that overuse of digital devices and making it a daily activity has been associated with sleep disorders. Moreover, some of these studies have shown that addiction to Facebook causes poor sleep quality (8). We don't forget the impact of watching TV on sleep quality, as scientific evidence has shown that over-watching TV programs or surfing the Internet often causes impaired sleep quality. This may be because the radial effect of these electronic devices influences the process of social transformation, causing disruption to the daily routine of life (9). Many young people spend more than half their time on social media sites such as Facebook, either by cell

phone, computer or other devices. These devices negatively affect natural sleep stimuli and create the stimuli that keep people awake, causing a disturbance in sleep (10). This study aims to find out the relationship between the use of electronic and digital devices before bedtime and sleep sufficiency among a sample of young people, and to determine any significant relationship when using digital devices before going to sleep with regard to the duration and number of mobile phone calls per night.

## Methods

This was an analytical cross-sectional study. It was based on the collection of self-reported data from 383 young adults between the ages of 18-25 attending Al-Tahrir Primary Health Care Centers in Baquba City for immunization. This included three primary health care centers from the September 15<sup>th</sup>, 2019 to January 10<sup>th</sup>, 2020. All healthy young people were included in the study, while sick people and those under the age of 18 and over 25 were excluded. The sample size was based on the total population of people behaving the sample (11). The level of confidence was 95% and margin of error was 5%, depending on the following formula:

$$\text{Unlimited population: } n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2}$$

$$\text{Finite population: } n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2 N}}$$

where

$z$  is the z score

$\epsilon$  is the margin of error

$N$  is the population size

$\hat{p}$  is the population proportion

A simple questionnaire was developed based on a good deal of literature on the impact of the use of different electronic and digital devices on the sufficiency of sleep. They included television, play station, computer and cell phone. The approach was to apply ethical considerations regarding an informed consent, voluntary participation, non-exposure to harm, and a complete confidentiality with no mention of the participant's name.

### Research tool

The questionnaire was the main tool in this study. The validity of the questionnaire was carried out by introducing it to 5 experts to confirm the internal validity of the information. Some modifications were made. We conducted a pilot test on 10 volunteers who were not included in the study by test-retest reliability. Through this and the results of reliability coefficients (inter examiners 96.2% and intra examiner 94.4%), the reliability was evaluated, and the reliability coefficients of the studied questionnaire were 0.86 based on Alpha (Cronbach), 0.75 based on Spearman Brown.

The questionnaire consisted of several parts. Age and sex were within the first part. The second part contained a set of questions related to the time spent on electronic or digital devices. The third part contained two questions related to the use of mobile phone, of which first related to the duration of the call, and the second one related to the number of phone calls. In addition to questioning the respondent about the number of hours of sleep the night preceding his/her participation in the study. 7-9 hours of sleep per night was considered being normal (3). Gender data were displayed in the form of frequencies and percentages. Questions related to the time spent on electronic devices and the duration and number of calls on phones were displayed according to their relationship to the means and the standard deviations of the number of hours of sleep during the previous night.

### Statistical Analysis

In this study, the SPSS program, version 20 was used for statistical analysis of all the descriptive and inferential data studied. T-test was

used to find a possible relationship between the variables, and the value below 0.05 was taken into consideration as a level of significance.

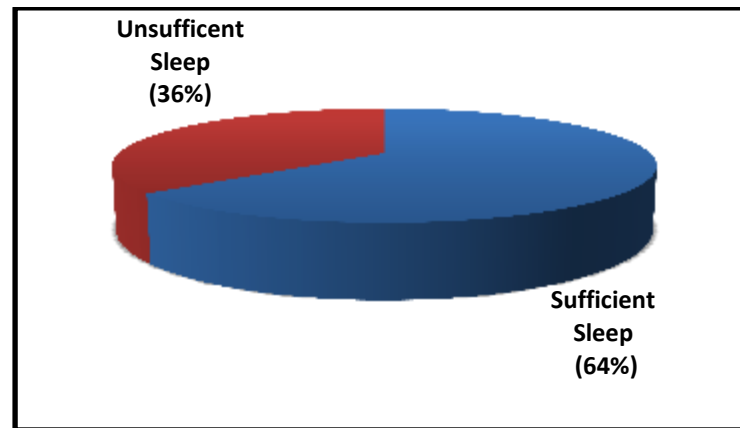
### Results

Based on the current study, most of the respondents (64%) reported that the number of hours they slept was sufficient after they turned off the digital devices. The rest of them (36%) have not been reported to have enough sleep, as shown in the diagram (1).

The mean of hours of bedtime after electronic or digital devices were turned off was higher among males ( $7.21 \pm 1.964$  hours) than females ( $6.93 \pm 1.837$  hours), with no significant relationship.

Table.1 shows an increase in the mean of hours of use regarding digital and electronic devices at night. They included watching television screen; using play station, computer screen for different reasons, cell phone for gaming, and the Internet (2.8, 1.20, 2.13, 5.37, and 10.90 hours) respectively, which in turn affects the sufficiency of normal sleep among the participants. The results of the study indicated a significant statistical relationship only between the high mean of hours regarding cell phone use for gaming and the Internet, and insufficient sleep, as shown in the Table.1.

In Table 2, we found that, for people who reported not enjoying sufficient sleep during the night, the mean duration of cell phone call per night was statistically higher (13.36 minutes) than those who reported having sufficient sleep (10.38 minutes). This study also suggested that the mean high number of mobile phone calls (5.16) were significantly associated with inadequate sleep hours per night, as shown in the Table. 2.



**Figure 1.** Distribution of Respondents with Regard to Sleep Sufficiency

**Table 1.** The Mean of Pre-bedtime Device Use in Correlation with Sleep Sufficiency

Type of Electronic or Digital Device	Sleep Status		Statistics
	Sufficient 7-9 hours	Insufficient < 7 hours	
Television	2.01±3.529	2.87±3.480	t-test = -1.634, p-value=0.104
Play station	1.05±2.126	1.20±2.003	t-test = -0.479, p-value= 0.633
Computer for different uses	1.48±2.620	2.13±3.163	t-test = -1.472, p-value= 0.143
Cell phone for gaming	3.46±4.966	5.37±5.004	t-test = -2.570, p-value= 0.011
Cell phone for social media	6.24±5.423	10.90±6.086	t-test = -5.630, p-value= 0.000

**Table 2.** The Mean of Pre-bedtime Cell Phone Use in Correlation with Sleep Sufficiency

Cell phone use for calling before going to bed	Sleep Status		Statistics
	Sufficient 7-9 hours	Insufficient < 7 hours	
Phone call duration per night/min	13.36±16.051	20.38±27.164	t-test= -2.072 =, p- value=0.040
The number of phone calls per night	4.05±3.488	5.16±2.928	t-test = -2.318, p-value=0.022

## Discussion

Although most of the respondents were found to be normal sleepers, one third of them remaining had reported fewer hours of sleep than normal. This may be the result of using these devices. Comparably, more than 30 percent of American adults did not get enough hours of sleep according to the Centers for Disease Control and Prevention (CDC). This study revealed that the proportion of females who used technological devices before bedtime reported that they enjoyed more hours of sleep than males did. Accordingly, many experimental studies in different countries like Britain have shown that females experience more sleep problems (12). Another study conducted on a

large population in South Brisbane demonstrated that the prevalence of low sleep quality in females was more than males (13). Although the quality of sleep in men was better than those women, we did not find a significant relationship between sleep sufficiency and gender. Similarly, this was found in other Brazilian (9) and Turkish studies as well (10).

According to the findings, insufficient sleep in adults occurs as a result of an increase in the mean hours of watching TV, playing with play station, using a cell phone for gaming or the Internet, and sitting behind the computer screen before going to sleep. Respondents in an Italian study reported that their sleep problems increase with the increase of

their activities on the Internet, cell phones, and social media websites (5). A study in Hordaland found a close negative relationship between the use of electronic devices available to adolescents during the day and night, and poor sleep condition. It recommended restriction by health media on the use of these devices (14).

This research demonstrated that the time of phone call was longer among Iraqi young adults who reported insufficient sleep hours before bedtime. A Belgian study showed that most adolescents used cell phones after turning off the lights. There was no safe time to use phones for calling or sending messages (15). Another Saudi study revealed that nine out of ten smartphone owners use their phones at bedtime (16). Munezawa et al. in Japan found that calling with a smartphone after going to bed is associated with poor sleep periods (17).

Cell phones can be easily carried and taken to bed and then used in many facilities, including calling others (18). Young people in the sample significantly reported their use of mobile phones through calling, Viber, and WhatsApp with an average of five times before going to sleep. A Belgian study revealed that there is no safe dose and proper time to use the phone after turning off the lights and going to bed (15). It should be determined that when young people go to bed every night and when they wake up every morning on a daily basis as part of a lifestyle change. This will greatly help them get the healthy and adequate sleep they need (11). This is due to the fact that

many studies indicated a relationship between the duration of time a person spends online using various digital devices, especially with regard to delayed onset of sleep and poor sleep quality (19).

## Conclusion

The study found that most participants reported adequate sleep after electronic or digital devices were turned off. This research also suggested a significant relationship between the mean number of hours using phone for social networking and playing games at night and the lack of sleep. This happens as the increase in the mean number and duration of calls before sleep was significantly associated with lack of sleep.

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## Author's contribution

The author contributed in conducting all the research requirements and aspects of the manuscript, except for the stage of statistical analysis and the method of calculating the sample size, also he contributes in making all the corrections and modifications sent by the journal.

## Conflict of interest

The author declared not conflict of interest

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