

Candidate 4 evidence

PSYCHOLOGY ASSIGNMENT

Correlation between screen time and quantity/quality of sleep gained.

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Psychology assignment

Introduction

The area of psychology investigated in this project is sleep. Sleep looks at the correlation between screen time and the hours/quality of sleep gained. Circadian rhythms are our bodies natural process that vary over a 24-hour cycle. Circadian rhythms are controlled by communication between the brain and light/dark cues. Psychologists have identified that homeostasis (internal balance) is maintained by an area of the brain called the hypothalamus, this controls many important functions such as food and water intake and temperature control.

Inside the hypothalamus is an even smaller area, this is called suprachiasmatic nucleus (SCN) this acts as your body's internal pacemaker. Light (also known as "zeitgeber", (German for "time-giver")) powers this internal pacemaker. If light travels into the eye, through the retina, it sends a signal to the SCN that tells us it's time to be awake. If it's dark this triggers the pineal gland to release the hormone melatonin, which makes us feel sleepy.

Devices screens, such as smart phones, laptops and tablets, all give out a blue light. Blue light acts just as natural light does on our circadian rhythms and signals our brain to stop producing melatonin. This suggests that even though the sun goes down and the natural melatonin production should begin, this is delayed by increase in screen time before bed therefore, the longer it takes for sleep cycles to begin the less quantity of sleep gained.

Oswald's restoration theory suggests that the body recovers during NREM sleep and the brain recovers during REM sleep. Sleep occurs in all animals therefore it must have some sort of survival benefit due to natural selection. Suggesting a lack of sleep could cause harm to our bodies and wellbeing.

Hysing et al (2015) studied the theory that electronic media use was expected to be inversely related to sleep duration and sleep deficiency. The adolescents recorded their time spent on electronic devices before bed, ranging from cell phones to TV, to gaming devices. After which their bedtimes, time in bed and awakenings were recorded. It was concluded that the bright light from the devices later at night may interfere sleep and circadian rhythms or indirectly delaying our melatonin production. This shows that there is a relationship between electronic devices and sleep. This gives an indication that a relationship may be found in this current study.

One study in which investigates this is the Owens et al (1999) Television viewing and sleep disturbance. The study examines the relationship between television-viewing habits and sleep disturbances in a group of elementary school children. The sample consisted of 495 children, equally split male and female, the parents recorded the amount of screen time their children had. A CSHQ 45 item parent sleep questionnaire was used to examine the children's sleep. These items consisted of bedtime behaviour, sleep duration, morning awakening and daytime sleepiness. Parents were asked to recall or relate these events to the past week or the average week, with the answers rating on a scale from rarely, to sometimes and to usually. The findings consisted 89.9% of parents claimed that television had minor or no effect on

their child's sleep. The Owens et al (1999) study concluded in the null hypothesis of the study being conducted.

Another study conducted at Oxford University suggests that the amount of time children spend on devices has little effect on how long they sleep. The study relied on data from a study conducted in 2016 US into children's health. Parents of children aged 6 months to 17 years completed two questions about weekly habits of the children in the Oxford University study. The findings show that children who had spent their day away from the electronic devices only slept around half an hour longer than the children whom of which spent majority of their day in front of a device relating to the correlational hypothesis of this study. However, this study relies on the answers of parents, like the Oswald et al (1999) study, therefore it gives the opportunity for the parents to lie and in turn make the results unreliable as they may not want to be viewed as affecting their child's wellbeing.

Aim - To identify the correlation between screen time before sleep and the quantity/quality of sleep.

Correlational hypothesis - The increased hours of screen time intake before sleep will affect the amount of sleep gained.

Null hypothesis - There will be no relation between screen time and the hours/quality of sleep gained.

Method/design

The study was conducted using a correlational method as there was no cause and effect due to no independent or dependant variables. However, there were numerous co-variables, this included hours spent on electronic devices and hours of sleep gained or quality of sleep gained. A survey was created to give the ability to compare and investigate the similarities and outcomes of specific questions regarding the correlation between artificial lights and sleep. This was effective as it was simple to conduct, time effective and gave the researchers all the resources needed to conduct a conclusion to the study. The study was carried out on a small budget as all materials required were cheap and easy to find. However, participants must answer all questions correctly therefore the survey must be easily understood and easy to answer, for example in this study questions were answered numerically or on a scale of one to ten. Questions were straightforward and easy to understand, using closed questions made it easier to analyse as there was no area for further comments. This made it uncomplicated to compare as all answers were numerical.

Extraneous variables could alter the surveys content such as if the participant has any sleep disorders/ taking any medication which affects sleep as the study does not ask this and could alter their answers. Another variable could be the environment in which the participant completed the study, each participant filled the study in their classroom in which majority were different with varying number of students in each one. However, all classrooms are designed produced in the same way therefore no major differences in the environment were present.

Sampling/ participants

For this specific study the target population was senior pupils at a high school, all teenagers around the age of 16-17. Participants were both male and female, 57% male and 43% female, 30 participants in total. Participants were selected through opportunity sampling as it was the quickest and simplest form of sampling, convenient for the study. This was selected as participants had to be no specific age, gender or background. It also ensured all participants were willing to take part therefore answers could be more reliable.

Materials

The materials used were the briefing form (see appendix 1), pens, desks and chairs, the consent form and instructions (see appendix 2). The survey used (see appendix 3) and the debrief form (see appendix 4).

Procedure

Participants were issued with a briefing form. Following this, all participants were given a consent form to fully agree to the study and confirm their signature, date of birth (over the age of 16 only) and the date, the form also included the instructions of the survey they were about to complete. Afterwards the surveys were given out, each survey was numbered to match the consent form given to each individual participant in the instance they wish to withdraw from the study later on. The survey was based off of the Hysing et al (2015) study on sleep and use of electronic devices. It also consisted of 12 questions, multiple choice, a scale of 1-10 and open questions. Following the completion of the survey, participants were

presented with a debriefing form, this revealed the aim of the study. All participants kept their own copy of a debriefing form. Participants were given 20 minutes to complete the task and hand back their surveys.

Ethics

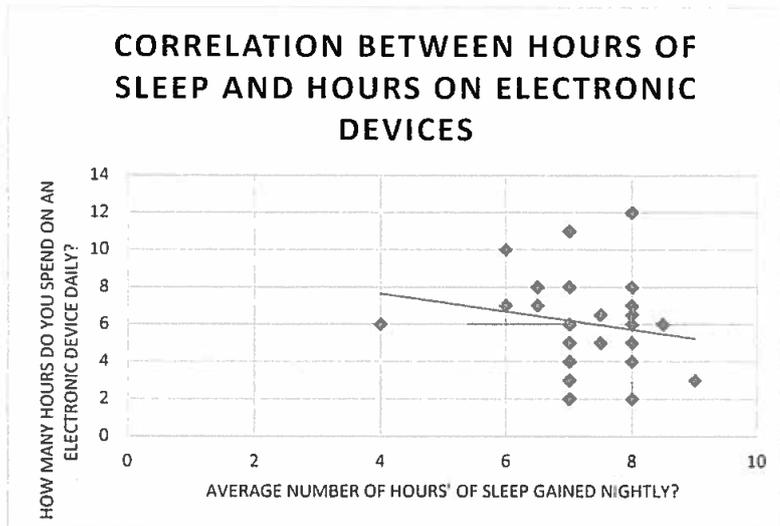
Throughout the study the researchers ensured they followed the British Psychological Society (BPS) ethical guidelines were applied. Anyone under the age of 16 is seen as a child by the BPS, therefore are not allowed to be involved in any study as they cannot consent. As a result, all participants in this study were over the age of 16. However, the participants were misled in the true nature and meaning of the study, this is an act of deception which is against the BPS guidelines as the participant cannot give full consent to the study, they are about to partake in. All files revealing the participants information (name, age etc) were all kept in a filing cabinet and in a locked classroom so ensure confidentiality, only the researchers and class teacher had access to these files. If the participant wishes to withdraw from the study contact details are given before the study, also participants agree that any information about the study is not to be talked about out with the event therefore full confidentiality can be confirmed. Protection of participant was followed as the ethical guidelines state that the risk of physical and psychological harm should be no greater than everyday life. The study took place in classrooms and no questions within the study gave any indication of psychological harm to participants, all participants educated of their rights.

Results

All data was then inserted into a spreadsheet table split up by participants and question (see appendix 5). With the use of a table, it gives a clear visual of participant's answers and gives the ability to easily compare specific questions to conduct a correlation. Although it is time consuming it is most effective as its easily accessible for the researchers and gives a clear vision of the result from the study. All participants answer to questions 2 and 3 are shown below. Question 2, "What's the average number of hours' sleep gained nightly?" and question 3, "How many hours do you spend on an electronic device per day?". Both answers given in hours.

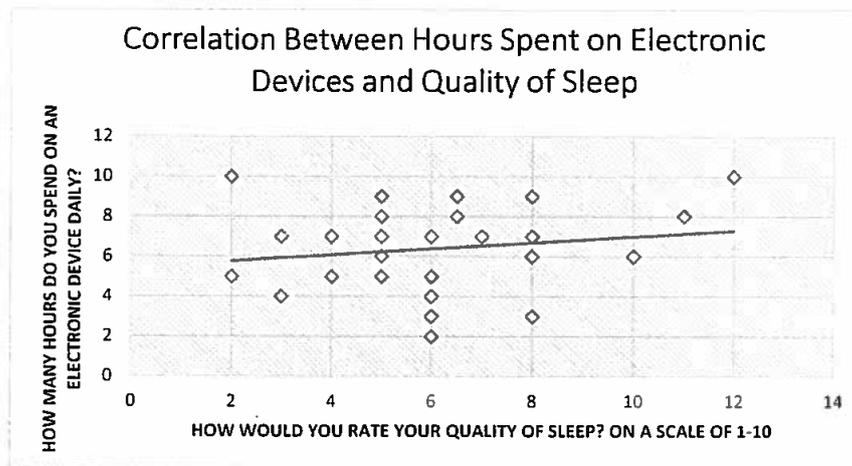
PARTICIPANTS	Q2 – Average hours of sleep gained nightly?	Q3 - how many hours do you spend on an electronic device daily?
1	6	10
2	7	6
3	8	5
4	8	8
5	7.5	5
6	7	4
7	8	5
8	7	6
9	7	3
10	7	2
11	8	12
12	8	2
13	7	4
14	7	8
15	8.5	6
16	8	6.5
17	7	8
18	7.5	6.5
19	8	7
20	6.5	7
21	7	6
22	7	5
23	4	6
24	6	7
25	7.5	5
26	9	3
27	6.5	8
28	7	11
29	8	6
30	8	4

From this, the researchers correlated hours of sleep gained, and the hours of electronic devices and calculated to be placed into a scatter graph shown below. A negative directional hypothesis is shown meaning the hours spent on electronic devices has a negative effect on the hours of sleep gained. This supports the hypothesis that a relationship does exist although at some points on the graph the results lie quite far out of the best fit line. It evidentially shows that when the hours spent on electronic devices rise, the hours of sleep gained is likely to decrease. Thus, the null hypothesis is rejected.



PARTICIPANTS	Q3- how many hours do you spend on an electronic device daily?	Q4 – how would you rate your quality of sleep? On a scale of 1-10?
1	10	6
2	6	3
3	5	9
4	8	6
5	5	7
6	4	5
7	5	6
8	6	4
9	3	4
10	2	5
11	12	10
12	2	10
13	4	7
14	8	3
15	6	5
16	6.5	9
17	8	7
18	6.5	8
19	7	7
20	7	7
21	6	7
22	5	5

23	6	2
24	7	7
25	5	8
26	3	7
27	8	9
28	11	8
29	6	4
30	4	7



To further the study, the researchers looked at the correlation between the hours spent on electronic devices and the quality of sleep gained, questions 3 and 4. This gave a better insight into the relationship between sleep and artificial light from screens. In the scatter graph above it shows a positive directional hypothesis meaning that the higher the hours spent on electronic devices the less likely the participant was to have the most beneficial quality of sleep (quality of sleep shown on a scale of 1-10, 1 meaning the lowest and 10 meaning the highest). Hence the null hypothesis is rejected once more.

Discussion

The results show that there is a correlation between the hours of screen time and the hours/quality of sleep gained. It can be seen from the scatter graphs that directional results are shown therefore favouring the hypothesis of the study.

The research done by Hysing et al (2015) showed that the bright light from the devices later at night may interfere sleep and circadian rhythms or indirectly delaying our melatonin production. Consequently, agreeing with the results of this study where the higher the hours of electronic devices by participants found a deficiency in their hours of sleep or their quality of sleep.

A further study in which relates is the Chahal et al 'Availability and night-time use of electronic entertainment and communication devices are associated with short sleep duration and obesity among Canadian children'. This study consisted of a survey which was completed on 3395 grade 5 Canadian students, the survey included various questions regarding the children's lifestyles and health behaviours and a questionnaire on physical activity, and measurements of heights and weights. They also claim to have used random effect models to assess the associations of night-time access and use of EECds with sleep. It resulted in 64% of children having access to EECds in their bedroom and access to and night-time use of EECds were associated with a shortened sleep duration.

Furthermore, this relates to the study being examined as it is a continuous result of electronic device use before bed affecting the hours of sleep gained negatively and also supports Oswald's restoration theory that your body repairs any deterioration or damaged sustained during the day. This explains why the children also resulted in poorer diets and excess body weight as their bodies were not repairing themselves due to the lack of sleep.

To further this study in the future a wider population should be examined as this particular study only focuses on participants aged 16-17 and all from the same high school, therefore a wider range of population (for example age, culture and sex) could further the findings by generalising them and confirming the correlation. Additionally, it could be studied as an experiment by recording use of electronic device use and sleep, also varying device use time as an independent variable. This limits the ability for participants to carry out participant bias and cause results to be ineffective due to exaggeration and understating.

Throughout this study many strengths and weaknesses of the process arose. One strength of the study is that the participants were 16 males and 14 females, this made it possible to generalise the study to both genders. However, participants were only in a range of ages 16 to 17, this limits the study as it cannot be generalised to younger children or adults. A weakness of the study is the setting in which the survey was carried out, as the researches visited classes throughout the school, and it resulted in all the questionnaires being completed in different classrooms meaning participants didn't all experience the same process and factors in the classrooms could affect their performance such as presence of peers and background noise. Furthermore, a strength of the study was there was a large variety of questions which covered many aspects of sleep and use of devices, this gives the ability to use the research found to create more comparisons.

In conclusion, there is a relationship between screen device time and hours/quality of sleep gained due to the study above. This supports the initial hypothesis of the study to identify the

correlation between screen time before seep and quality/quantity of sleep. The results showed a directional hypothesis on the scatter graphs implying that screen time has a negative effect on our sleep and therefore has a negative an effect on our wellbeing.

References

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McBride, N. (2018) – Hysing et al (2015) class notes

McBride, N. (2018) – Owens et al (1999) class notes

Appendices

Appendix 1

Briefing Form

We are requesting for your participation in carrying out a survey involving questions related to sleep and electronic devices. This research will be used by your fellow [REDACTED] students for a higher psychology assignment. This survey will be carried out in the school and will take approximately 5 - 10 minutes. Your results will be put together and used in a group score.

Appendix 2

Consent form

You may refuse to take part or withdraw from the study at any time during or after it has taken place, therefore it is completely voluntary. If you have any questions on the results of this study, please use contact details provided in the debrief.

Any other enquiries can be accounted for by contacting the Higher Psychology Department within the school by using the provided details below.

To participate in this study, you are required to be the age of 16 or above. All data is protected and all personal details will remain confidential and anonymous.

Thank you for participating in this study.

Signature:

Date:

D.O.B:

Instructions

Step 1 - participant will be given briefing form and consent form if in agreement to take part, they will sign and date this

Step 2 - you will be given the questionnaire to complete within the 5 minutes' given

Step 3 - the participant will then be debriefed on the experiment after all questionnaires are collected after completion

Appendix 3

Survey

1. Circle the electronic devices you own.

* Smartphone

* Television

* Laptop

* Ipad /tablet

* Ipod

2. What's the average number of hours' sleep gained nightly?

.....

3. How many hours do you spend on an electronic device per day?

.....

4. How would you rate your quality of sleep? On a scale of 1-10, 1 being the worst and 10 being the best. Circle your answer.

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

5. How many times on average would you say you wake up during the night?

.....

6. On average what time do you go to sleep?

.....

7. How many electronic devices do you use before bed?

.....

8. How long does it take you to go to sleep? In minutes / hours

.....

9. How well rested do you feel in the morning? On scale of 1-10, 1 being the worst and 10 being the best. Circle your answer.

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

10. On a scale of 1-10 are you satisfied with your sleep? 1 being the worst and 10 being the best. Circle your answer.

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

Appendix 4

DEBRIEF

Thank you for taking part in this study.

The aim of this study was to identify the effects of artificial light in relation to sleep, in other words to see if quality and amount of hour's sleep would change depending on how many hours of artificial light eyes are exposed to before bed.

In relation to other studies it is expected that the more artificial light from electronic devices before bed will lead to less sleep or lower quality sleep.

If any participant feels uncomfortable now knowing the aim of this study, we would like to remind you that anyone can pull out at any time and all results will still remain confidential.

All information from participating students will be grouped and averaged then used in a higher psychology assignment.

If anyone has any questions or require further information about this study please contact [REDACTED], our higher psychology teacher (contact details below).

Also could we request the information about this study not be spread or talked about out with this area as it may alter other people's answers.

Thank you for your participation.

Contact Details

[REDACTED]

Teacher of Psychology

[REDACTED]

Email: [REDACTED]

Appendix 5

raw data											
participants	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Gender
1	ALL OP	6	10	6	1	2	3	60	1	5	F
2	OP 1,2,3	7	6	3	2	2	2	180	2	2	M
3	OP 1,2,4	8	5	9	0	10	1	30	9	10	M
4	ALL OP	8	8	6	3	11	2	20	7	7	F
5	OP 1,2,3,4	7.5	5	7	0	11	1	20	5	6	F
6	OP 1,2,3,4	7	4	5	1	11	1	20	6	6	F
7	OP 1,2,3,4	8	5	6	2	11	3	20	3	5	F
8	OP 1,2,3,4	7	6	4	1	12	2	30	2	2	F
9	OP 1,2,3	7	3	4	2	12	1	15	4	4	M
10	OP 1,2,3	7	2	5	0	12	1	10	5	5	M
11	ALL OP	8	12	10	1	1	2	20	4	2	M
12	OP 1,2,3,4	8	2	10	2	11	3	10	10	10	M
13	ALL OP	7	4	7	0	12	2	20	2	5	M
14	OP 1,2,3,4	7	8	3	2	11	4	5	3	2	M
15	OP 1,2,3,4	8.5	6	5	1	11	1	30	3	3	M
16	OP 1,2	8	6.5	9	0	11	1	3	6	10	F
17	OP 1,2,3	7	8	7	3	1	2	60	1	4	F
18	OP 1,2	7.5	6.5	8	0	11	1	30	7	8	M
19	ALL OP	8	7	7	1	12	2	20	5	5	M
20	OP 1,2,3	6.5	7	7	2	11	2	30	6	6	M
21	OP 1,3	7	6	7	1	12	1	20	3	4	M
22	OP 1,2,3	7	5	5	1	12	2	30	4	5	M
23	OP 1,2	4	6	2	3	2	1	60	1	1	M
24	OP 1,2	6	7	7	1	1.5	2	30	5	8	M
25	OP 1,2,3,4	7.5	5	8	0	10.5	1	15	8	8	M
26	OP 1,2,4	9	3	7	4	11	1	40	3	4	F
27	OP 1,2,3	6.5	8	9	3	1	1	10	8	7	M
28	OP 1,2,3,4	7	11	8	1	12.5	3	20	2	8	F
29	OP 1,2,3,4	8	6	4	3	11	2	30	5	4	M
30	OP 1,2	8	4	7	0	12	2	15	7	8	F