

Original Research Article

Electronic device use and its adversities among BPH students of Kathmandu valley

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ABSTRACT

Background: Electronic devices here means devices like computer, laptop, smart phones, e-games etc. Recently the ownership, use and time-spent on electronic devices has increased dramatically on all age groups for the purpose of communication, entertainment, education, work, etc. and mostly adults are dependent on these devices.

Methods: A descriptive cross sectional was done among 248 BPH students of Kathmandu valley. Four colleges were selected through lottery method and 62 students of 1st, 2nd and 3rd year were conveniently selected from each college by disproportionate stratified sampling. Semi-structured self-administered questionnaire was used to collect data which was analysed in SPSS version 21.0 and interpreted using bivariate test.

Results: All the respondents owned at least one electronic device. Smart phones were found to be the mostly used electronic device and entertainment was the main purpose for which the devices were used. 10.5% showed range of health adversities in relation to electronic device use with eye symptoms being the most common adversity. 80% were found to use electronic device before going to bed which was associated with the sleep quality of the respondents.

Conclusions: This study concluded that time-spent on electronic device is high and using electronic devices before bed time was significantly associated with the sleep quality. Not just sleep quality but excessive use of these devices for long run had the risk of developing health effects like headache, eye, ear and musculoskeletal symptoms and few had mild health effects.

Keywords: Electronic device dependence, Health adversities, Loneliness, Sleep quality

INTRODUCTION

Electronic Devices (ED) here simply means devices that are run by electricity and includes portable electronic devices (PED) like laptop, tablet, smart phones, e-games etc. and also desktop/PC. Recently the ownership, use and time-spent on electronic devices has increased dramatically among adult groups as well as adolescents as showed by different studies. These devices have many things to offer to people making it popular among all age

groups. It can be used for communication, entertainment, study purpose, office work and many more. However, it has both advantages and disadvantages and one should use it smartly to make it an utility.¹

These days using electronic device has become a necessity for many people. It is also true that these devices have made life easier for many people but now as suggested by many research using these devices continuously for a long time has negative effect on both physical and mental health of people. Some of the

physical symptom that develops due to continuous use of these devices includes Computer Vision Syndrome (CVS), occupational overuse syndrome, neck pain, lower back pain, headache, ear symptoms etc.² The main objective of this study was to determine the ownership, time-spent, use and dependence on electronic devices and hypothesis were set to find out their relation with different adversities like health symptoms, sleep quality and loneliness.

METHODS

Cross sectional descriptive study design was used to conduct this quantitative study among 248 BPH students of Kathmandu valley. Sample size was calculated using formula $n = \frac{z^2 pq}{d^2}$ and taking in consideration 0.8 prevalence of eye strain due to computer use from study "Computer Vision Syndrome Prevalence and associated factors among the medical student in Kist Medical College". 1st, 2nd and 3rd year students were included in the study and 4th year students were excluded.

There were 16 colleges affiliated to different university in Kathmandu valley offering BPH. Through lottery method 4 colleges were selected and through disproportionate stratified sampling, 62 students were conveniently selected from each college. Semi-structured and self-administered questionnaire was used along with some standard tools like PSQI for sleep quality, UCLA for loneliness and technology dependence assessment for dependency, to collect data which was analysed using the SPSS version 21 and interpreted using frequency, percentage, chi-square test. The results of the study were then presented using tables.

Research approval was taken from IRC of Nobel College, Sinamangal and Informed consent was obtained from respondents by clarifying the purposes of the study prior to the data collection.

RESULTS

It was found that among total respondents (248), respondents 77% were female whereas remaining 23% were male. The majority of the respondents were between the age group 16-20 i.e. 57% and. The mean age was 20.7 and standard deviation was 2.044. Majority of respondents were found to be Brahmin 39% and 93% of them followed Hinduism. First year students were more i.e. 93% (Table 1).

Out of 248 respondents, majority of them i.e. 94% and 87% owned smart phone and laptop respectively. Only few respondents i.e. 10% and 6% owned non-smart phones and E-games respectively (Table 2).

Majority of respondents i.e. 68.5% and 44.4% spent more than 1 hour using ED per day for visual and interactive content respectively. While, for audio content majority of the respondents (46%) used ED for less than 30 minutes.

61% of the total respondents used ED for more than 1 hour per day (Table 3).

Table 1: Socio-demographic characteristics.

Characteristics	Number (n=248)	Percentage
Sex		
Male	56	23
Female	192	77
Age (years)		
16-20	142	57
21-25	96	39
26-30	10	4
Ethnicity		
Dalit	7	3
Janajati	58	23
Madhesi	7	3
Brahmin	96	39
Chhetri	62	25
Others	18	7
Religion		
Hindu	231	93
Buddhist	10	4
Others	7	3
Type of family		
Nuclear	196	79
Joint	49	20
Extended	3	1
Education (year is bachelors)		
First year	112	45
Second year	93	38
Third year	43	17
Father's occupation		
Business	82	33
Service	101	40
Farming	29	12
Others	36	15
Mother's occupation		
Business	37	15
Service	56	23
Farming	41	16
Housewife	89	36
Others	25	10

Table 2: Ownership of electronic device.

Characteristics	Number (n=248)	Percentage
Electronic devices owned (multiple response)		
Laptop	215	87
Desktop/PC	41	16
Smart phones	233	94
Non-smart phones	24	10
Tablet	42	17
Audio/media player	80	32
E-games	16	6
Others	3	1

Table 3: Time spent on ED.

Characteristics	Number (n=248)	Percentage
Time spent on ED per day		
Visual content		
Less than 30 minutes	28	11.3
1 hour	50	20.2
More than 1 hour	170	68.5
Audio content		
Less than 30 minutes	114	46
1 hour	67	27
More than 1 hour	67	27
Interactive		
Less than 30 minutes	81	32.7
1 hour	57	23
More than 1 hour	110	44.4
Overall time spent per day on ED		
Less than 30 minutes	29	12
1 hour	68	27
More than 1 hour	151	61

We found that smart phones were the most used ED by the respondents i.e. 204 (82%) and second most used ED was laptop i.e. 36 (14.5%). According to the table Electronic device were found to be mainly used for Entertainment purpose by the respondents. More than half i.e. 59.7% respondents used ED for entertainment followed by social media purpose i.e. 27.8% (Table 4).

Table 4: Use of electronic device.

Characteristics	Number (n=248)	Percentage
Mostly used electronic device		
Laptop	36	14.5
Desktop/PC	2	0.8
Smart phones	204	82
Non-smart phones	5	2
Tablet	1	0.4
Main purpose of use		
Communication	15	6
Study purpose	15	6
Entertainment	148	59.7
Social media	69	27.8
Others	1	0.4

Our study showed eye symptoms to be most common health effects among ED users where 62.5% reported mild effect while 10.9% and 2% reported moderate and severe effect respectively. After eye symptoms, headache was the second most common health effect reported and third most common health effects seen among respondents due to ED use was musculoskeletal symptoms. Ear symptoms were the least common health effects among the respondents were more than half of the respondents reported no effect. 10.5% of the respondents

reported either serious health effect resulting from ED use (Table 5).

Table 5: Health effects in relation to ED use.

Characteristics	Number (n=248)	Percentage
Headache		
No pain	64	25.8
Mild	163	65.7
Moderate	15	6
Severe	6	2.4
Eye symptoms		
No pain	61	24.6
Mild	155	62.5
Moderate	27	10.9
Severe	5	2
Ear symptoms		
No pain	172	69.4
Mild	61	24.6
Moderate	14	5.6
Severe	1	0.4
Musculoskeletal symptoms		
No pain	110	44.4
Mild	111	44.8
Moderate	24	9.7
Severe	3	1.2
Overall serious health effects		
Effect	26	10.5
No effect	222	89.5

We found out that more than 53% of the respondents had poor sleep quality. We also found out that majority of the respondents used ED before bed i.e., 80%. Only 2% of the respondents never used ED before bed. However, more than half of the respondents i.e. 56% were found to have 7 or more than 7 hours of sleep (Table 6).

Table 6: Sleep quality of the respondents.

Characteristics	Number (n=248)	Percentage
Pittsburgh sleep quality index		
Good sleep	117	47
Poor sleep	131	53
Electronic device use before bed		
Always	199	80
Sometimes	45	18
Never	4	2
Slept ≥ 7 hours		
Yes	140	56
No	108	44

Among the respondents. 93.5% of the respondents were dependent on ED and 64% were lonely (Table 7).

Time spent on electronic devices for visual and interactive purpose was found to be associated with musculoskeletal symptoms (Table 8).

Electronic device use before bed was found to be associated with sleep quality of the respondents (Table 9). Age was found to be associated with dependency on electronic device with p-value 0.003 (Table 10).

Table 7: Technology dependence and loneliness assessment.

Characteristics	Number (n=248)	Percentage
Electronic device dependence		
Yes	232	93.5
No	16	6.5
UCLA loneliness assessment		
Loneliness present	158	64
Loneliness absent	90	36

Table 8: Relation between time-spent on ED use and musculoskeletal symptoms.

Time spent on ED	Musculoskeletal symptoms				Total	P value
	No	Yes	No	Yes		
Visual	Number	Percentage	Number	Percentage	Number	
<30 minutes	26	93	2	7	28	0.01
30 min to 1 hour	50	100	0	0	50	
>1 hour	145	85	25	15	170	
Interactive	Number	percentage	Number	Percentage	Number	
<30 minutes	78	96	3	4	81	0.04
30min- 1 hour	49	86	8	14	57	
>1 hour	94	85.5	16	14.5	110	

Table 9: Relationship between ED use before bed and sleep quality.

ED use before bed	Sleep quality				Total	P value
	Poor	Good	Poor	Good		
	Number	Percentage	Number	Percentage	Number	
Yes	114	57	85	43	199	0.005
No	17	35	32	65	49	

Table 10: Relation between age and dependence on electronic device.

Age (years)	Dependence on ED				Total	P value
	Yes	No	Yes	No		
	Number	Percentage	Number	Percentage	Number	
16-20	137	96	5	4	142	0.003
21-25	88	92	8	8	96	
26-30	7	70	3	30	10	

DISCUSSION

We could interpret from result that 77% of the respondents were females and 57% belonged to age group 16-20. Laptops and smart phones were owned by 87% and 94% of the respondents. Smart phones were the mostly used ED and entertainment was the main purpose for which devices were used. 10.5% of the respondents showed moderate to severe health adversities in relation to ED use with eye symptoms being the most common adversity. Also musculoskeletal symptoms were found to be associated with time-spent on ED. 80% of the respondents used electronic device before bed which was associated with the sleep quality of the respondents. 93.5% of the respondents were dependent on electronic

device and 64% were found to be lonely however, these two variables were not associated with one another (p-value=0.23).

Headache, musculoskeletal, eye and ear symptoms

In this study, 74% and 75% of the respondents reported headache and eye symptoms respectively in response to ED use. A study conducted among young medical students also showed results where 16.08% complained of headache. People are spending more hours on screen these days and as shown by a study conducted in Egypt among medical students 86% complained to have more than one type of CVS. Also, in a study conducted in

Nepal 89% reported eye strain and 71% complained of headache.³

A study that not just included students but also office workers found out 44.7% prevalence of musculoskeletal problems and also found out that a significant association was present among musculoskeletal problems and duration of computer use, same as shown by this study where ED use for interactive and visual purposes were found to have statistically significant association with musculoskeletal symptoms.⁴

Ownership, time-spent and purpose of electronic device use

This research showed that 100% respondents owned one or the other type of electronic devices and 94% respondents owned smart phones which is in support with the study done by Iman A. El Kiweri and Najoud A. Al Ghamdi among Saudi Female Nursing students which showed in its study that 92.4% owned electronic device and 95.9% owned mobile phones. This same study also showed that 43.3% of the Saudi Female Nursing students used computer for more than an hour per day and this study showed 61% of the BPH students spent more than an hour on Electronic device per day.⁵

Sleep quality, dependency and loneliness

In this study 53% of the respondents were found to have poor sleep as measured by PSQI similar to another study of Saudi that showed 52% of its respondents had poor sleep quality.⁵ Late night use of electronic devices were found to have adverse effect on sleep quality and from the respondents using electronic devices from 19:00 to 24:00, 73% slept poorly as shown by a study "Quality of sleep among university students: effects of night-time computer and television" which was similar in this study as well where 80% used ED before bed which was found to have statistically significant association with the sleep quality ($p=0.005$).⁶ In this study, more than seven hours sleep duration was reported by 56% of the respondents while another similar study showed much higher percentage i.e. 89.5% Dependency on ED was high in this study i.e. 93.5% and not just in this study but a similar study conducted among Saudi female nursing students showed 77% dependency on electronic devices.⁵

This study has some limitations. Increased screen time and dependence on electronic devices has been found to be a risk factor for different health condition as well as disturbances to the sleep pattern. It would be good if further studies focused on whether sleep disturbances due to ED use could be a risk factor for mental health. Also, future research can be focused on mechanisms relating ED use with health effects and sleep quality to understand it better to develop evidence-based and effective intervention programs. Future research might also be directed to find out ways on how to encourage

respondents from using ED mostly for Entertainment to using ED for other productive activities.

CONCLUSION

This study concluded that using electronic devices before bed time was significantly associated with the sleep quality. Not just sleep quality but excessive use of these devices for longer time had the risk of developing health effects like headache, eye, ear and musculoskeletal symptoms among the users and few of the respondents had already reported moderate to severe health effects in response to the use. Loneliness however was not found to be associated with dependence as per this study, even though the dependent and lonely respondents were high.

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