

Research Article

Screen Time and Associated Health Problems Among Undergraduates of University of Sri Jayewardenepura, Sri LankaPatterson, N.M.¹, & Warnakulasuriya, S.S.P²¹Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka.²Faculty of Nursing, University of Colombo, Sri Lanka.**Abstract**

Background and Objective: The combined time consumed by undergraduates for television viewing, internet usage and playing video games is considered as screen time. Previous studies provide evidence that screen time is associated with many complaints, such as headache, backache, and sleep problems. This study is aimed to investigate screen time and associated health problems among undergraduates.

Methods: This descriptive cross-sectional study was conducted among conveniently selected 430 undergraduates from four faculties of the University of Sri Jayewardenepura. A pre-tested self-administered questionnaire was used to collect data. Data were analyzed using SPSS version 20. Descriptive and inferential statistics were used.

Results: Results indicated that the mean screen time was 315.8 (SD=256.2) minutes per day during the week and 456.5 (SD=294.3) minutes per day during the weekend. Using the internet was the commonest screen activity among undergraduates rather than other screen time activities. Excessive screen time was significantly associated with headache, higher sleep latency, shoulder pain, hand pain, and pain in the eyes among undergraduates ($p < .05$).

Conclusions: The findings indicated that a higher screen time could lead to health problems among undergraduates. Therefore, the student population need to be informed of the impact and adverse effects of excessive screen time usage and actions should also be taken to minimize modifiable determinants of excessive screen time.

Keywords: screen time, health problems, undergraduates, Sri Lanka

Sri Lankan Journal of Nursing, 2022, 1 (1) : 21 - 32

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Received: 25th June 2021; Accepted: 24th December 2021; Published 12th February 2022

How to cite: Patterson, N.M., & Warnakulasuriya, S.S.P. (2022). Screen time and associated health problems among undergraduates of University of Sri Jayewardenepura, Sri Lanka. *Sri Lankan Journal of Nursing*, 1(1), 21–32.



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Introduction

The availability of screens, easy access to the internet, and the increasing importance of social media in the lives of young people have normalized screen time behaviors worldwide (Boniel-Nissim et al., 2015). Screen time includes the time spent on media devices such as television, computers (desktops and laptops), mobile phones, tablets, hand-held devices, or other visual devices for different screen time activities; viewing television, using internet and playing video games (Busch et al., 2013). With the increasing use of these screen-based media devices, people are most likely to have various health problems such as headache, backache, hand, arm, shoulder and neck pain (Jensen et al., 2002; Torsheim et al., 2010), obesity (Maher et al., 2012), feeling low (Marques et al., 2015) and sleep problems (Parent et al., 2016). Further, physical factors such as repetitive body movements when engaging in screen activities for long hours cause musculoskeletal symptoms (Jensen et al., 2002). Increased use of screen time negatively affects not only the physical well-being of people, but also the daily routine activities and family relationships (Patrikakou, 2016), social behaviors, and social interactions (Sigman, 2012). Therefore, excessive screen time behavior holds the potential to be harmful to one's health.

Some sleep problems such as sleep onset latency, irregular sleep patterns, shorter sleep duration are predicted with longer hours of watching television and using social networking websites (Tavernier & Willoughby, 2014). Regardless of the developmental stage of youth, higher levels of screen time usage by youth were found to be associated with more sleep disturbances (Parent et al., 2016). Using digital media, especially in the hour before going to sleep can contribute to poorer or disrupted sleep, and those are varied by the type of digital media used (Orzech et al., 2014). In addition, bedtime access to and use

of a media device were associated with sleep outcomes such as inadequate sleep quantity, poor sleep quality, and excessive daytime sleepiness (Carter et al., 2016). All the above factors imply that prolonged screen usage and associated problems have become a global concern.

University students represent a particularly vulnerable group for problems associated with screen time due to use of new media such as digital platforms (Akulwar-Tajane et al., 2020). Every student has at least a mobile phone, many of them own desktop or laptop computers and access to computer facilities and internet within the university. Most of the university students use media devices not only for education purposes but also for watching videos, gaming and social media (Sigman, 2012).

Spending excessive time on screen devices can lead to many health problems among undergraduates which would contribute to disturb or distract them from educational activities (Aust et al., 2019). When they are knowledgeable regarding the associated health problems actions could be taken to limit or modify their screen time in order to reduce the harmful health effects and to maintain proper psychosocial status. In addition, students can develop strategies which are helpful to make screen time more meaningful for their academic activities and other purposes thus reducing perceived time wasted on video games, TV viewing, and using the internet. By doing so, university students can enhance their academic performance and well-being. Therefore, this study is aimed to investigate screen time and associated health problems among undergraduates at the University of Sri Jayewardenepura, Sri Lanka.

Methods

This descriptive cross-sectional study was carried out at the University of Sri Jayewardenepura, Nugegoda, Sri Lanka. A sample of 430 third

year undergraduates of the Faculty of Medical Sciences, Faculty of Humanities & Social Sciences, Faculty of Management Studies and Commerce, and Faculty of Applied Sciences were recruited by using the convenience sampling method. Data were collected during January to March 2018. A pre-tested self-administered questionnaire was used to collect data which was developed by investigators. The variables were selected following an extensive review of the literature. The questionnaire consisted of three sections, a) socio-demographic data, b) estimation of screen time, and c) associated health problems such as stress, headache, backache, shoulder pain (Torsheim et al., 2010), and sleep problems (Vallance et al., 2015). Data were analyzed using SPSS software (Version 20). Descriptive statistics were used to determine the frequency of health problems. Chi-square test was used to identify any significant associations and for this purpose, data related to sleep were categorized based on Vallance et al. (2015) criteria and other screen time data were categorized as 'normal' and 'excessive' based on the median values. Participants who responded as 'often' to each health problem were included in the 'often' category and others were included in the 'not often' category. Stress levels were categorized as 'severe' and 'not severe' for the purpose of assessing the associations. Ethical approval was obtained from the Ethics Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura (Ref. No: Nur/10/17). All participants were made aware regarding the study and informed written consent was obtained.

Table 2: Time spent on screen activities (N=430)

Screen Activity	During the Week (Minutes/Day)		Weekend (Minutes/Day)	
	Mean	SD	Mean	SD
Watching TV, offline videos	101.99	107.37	184.34	135.97
Playing videogames	27.76	80.57	40.90	103.17
Using internet	190.28	191.08	239.43	226.27
Total screen time	315.84	256.24	456.49	294.26

Results

Background characteristics

A total of 430 university students (females 71.2%, n=306) participated in this study (Table 1). The mean age of the participants was 23.79 years (SD=1.68) with an overall range between 21 and 36 years. The majority (n=423, 98.4%) used mobile phones, followed by laptop computers (76%, n=327) for their day-to-day activities. Only 39.3% (n=169) used television, followed by 13.5% (n=58) desktop computers and 14.7% (n=63) tablets, respectively. Approximately 85% (n=365) of participants used two or more screen devices.

Table 1: Characteristics of participants (N=430)

Variable	Categories	n (%)
Age	≤24 years	320 (74.4)
	>24 years	110 (25.6)
Gender	Female	306 (71.2)
	Male	124 (28.8)
BMI	Underweight	107 (24.9)
	Normal weight	248 (57.7)
	Overweight	59 (13.7)
	Obese	12 (2.8)

Screen time

The screen time usage is presented in the Table 2 and Table 3. Accordingly, the mean screen time on a week-day and a day during weekend were 315.8 minutes (SD=256.2) and 456.5 minutes (SD=294.3) respectively.

Table 3: Screen time usage among study participants (N=430)

Screen time activity		Weekday n (%)	Weekend /day n (%)
Watching TV, offline videos	< 5 hours	416 (96.7)	376 (87.4)
	5-10 hours	13 (3)	53 (12.3)
	>10 hours	1 (0.2)	1 (0.2)
Playing videogames	<5 hours	423 (98.4)	416 (96.7)
	5-10 hours	6 (1.4)	13 (3.0)
	>10 hours	1(0.2)	1 (0.2)
Using internet	<5 hours	368 (85.6)	344 (80.0)
	5-10 hours	54 (12.6)	72 (16.7)
	>10 hours	8 (1.9)	14 (3.3)
Total screen time	<5 hours	263 (61.2)	166 (38.6)
	5-10 hours	131(30.5)	168 (39.1)
	>10 hours	36 (8.4)	96 (22.3)

Table 4: Health problems among participants

Variable	Category	n (%)
Headache (n=430)	Very often	97 (22.6)
	Sometimes	211 (49.1)
	Rarely	98 (22.8)
	Never	24 (5.6)
Backache (n=429)	Very often	19 (4.4)
	Sometimes	135 (31.5)
	Rarely	166 (38.7)
	Never	109 (25.4)
Neck pain (n=430)	Very often	19 (4.4)
	Sometimes	95 (22.1)
	Rarely	153 (35.6)
	Never	163 (37.9)
Shoulder pain (n=429)	Very often	23 (5.4)
	Sometimes	77 (17.9)
	Rarely	142 (33.1)
	Never	187 (43.6)
Pain in eyes (n=430)	Very often	52 (12.1)
	Sometimes	163 (37.9)
	Rarely	124 (28.8)
	Never	91 (21.2)
Feeling low (n=428)	Very often	57 (13.3)
	Sometimes	182 (42.5)
	Rarely	126 (29.4)
	Never	63 (14.7)

Table 5: Associations of screen time with health problems (Headache, Backache and Feeling low)

	Headache (n=430)					Backache (n=429)					Feeling low (n=428)					
	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI
Viewing TV, videos on a weekday	50 47	Excessive Normal	1.09	0.69-1.72	11 8	202 208	1.41	0.56-3.59	30 27	182 189	1.15	0.66-2.02				
Viewing TV, videos on a day during weekend	40 57	Excessive Normal	1.25	0.78-1.97	10 9	150 260	1.9	0.76-4.85	20 37	138 233	0.91	0.51-1.63				
Playing videogames on a weekday	31 66	Yes No	1.46	0.89-2.40	3 16	109 301	0.52	0.15-1.81	13 44	98 273	0.82	0.42-1.59				
Playing videogames on a day during weekend	28 69	Yes No	1.20	0.73-1.99	4 15	108 302	0.74	0.24-2.30	15 42	96 275	1.02	0.54-1.93				
Using internet on a weekday	50 47	Excessive Normal	1.30	0.83-2.04	11 8	189 221	1.61	0.63-4.08	33 24	166 205	1.70	0.97-2.99				
Using internet on a day during weekend	57 40	Excessive Normal	2.12	1.34-3.35*	12 7	179 231	2.21	0.85-5.73	34 23	157 214	2.02	1.14-3.56*				
Total screen time per weekday	48 49	Excessive Normal	1.06	0.67-1.67	12 7	196 214	1.87	0.72-4.85	33 24	174 197	1.56	0.89-2.74				
Total screen time per day during weekend	52 45	Excessive Normal	1.70	1.08-2.67*	11 8	176 234	1.83	0.72-4.64	27 30	159 212	1.2	0.69-2.10				
Using social media	48 49	Excessive Normal	1.22	0.78-1.93	12 7	184 226	2.11	0.81-5.48	36 21	158 213	2.31	1.30-4.11*				
Using TV	40 57	Yes No	1.11	0.70-1.76	10 9	159 251	1.75	0.70-4.41	24 33	144 227	1.15	0.65-2.02				
Using desktop computers	23 74	Yes No	2.64	1.47-4.73*	1 18	57 352	0.34	0.05-2.62	9 48	49 321	1.23	0.57-2.66				
Using laptop computers	66 31	Yes No	0.58	0.36-0.97	15 4	312 98	1.18	0.38-3.63	40 17	285 86	0.71	0.38-1.32				
Using tablet computers	20 77	Yes No	1.75	0.97-3.15	3 16	60 350	1.09	0.31-3.87	9 48	54 317	1.01	0.51-2.37				
Using mobile phones	97 0	Yes No	0.77	0.73-0.81	19 0	403 7	0.96	0.93-0.98	57 0	364 7	0.87	0.83-0.90				
No. of devices >2	50		1.55	0.98-2.45	11	174	1.86	0.73-4.71	27	157	1.22	0.70-2.14				
No. of devices ≤2	47		1.97		8	235			30	213						

Chi-square statistics *Significant associations (p < .05)

Table 6: Associations of health problems with screen time (Neck pain, Shoulder pain and Hand pain)

	Neck pain (n=430)				Shoulder pain (n=429)				Hand pain (n=430)			
	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI
Viewing TV, videos on a weekday	9 10	205 206	0.90	0.36-2.27	14 9	199 207	1.62	0.68-3.82	17 17	197 199	1.01	0.50-2.03
Viewing TV, videos on a day during weekend	9 10	151 260	1.55	0.62-3.66	9 14	151 255	1.09	0.46-2.44	15 19	154 251	1.38	0.67-2.77
Playing videogames on a weekday	8 11	104 307	2.14	0.84-5.48	8 15	104 302	1.55	0.64-3.76	14 20	98 298	2.13	1.04-4.38*
Playing videogames on a day during weekend	7 12	105 306	1.70	0.65-4.43	7 16	105 301	1.25	0.50-3.13	13 21	99 297	1.86	0.90-3.85
Using internet on a weekday	11 8	189 222	1.62	0.64-4.10	17 6	183 223	3.45	1.33-8.94*	22 12	178 218	2.25	1.08-4.66*
Using internet on a day during weekend	11 8	180 231	1.77	0.70-4.48	13 10	191 238	1.67	0.71-3.89	24 10	167 229	3.29	1.53-7.07*
Total screen time per weekday	10 9	198 213	1.20	0.48-3.00	17 6	191 215	3.19	1.23-8.25*	21 13	187 209	1.81	0.88-3.71
Total screen time per day during weekend	11 8	176 235	1.84	0.72-4.66	14 9	173 233	2.10	0.89-4.95	23 11	164 232	2.96	1.40-6.24*
Using social media	12 7	184 227	2.12	0.82-5.48	16 7	180 226	2.87	1.16-7.13*	25 9	171 225	3.66	1.66-8.03*
Using TV	7 12	162 249	0.89	0.35-2.33	10 13	159 247	1.20	0.51-2.79	15 19	154 242	1.24	0.61-2.51
Using desktop computers	6 13	52 358	3.18	1.16-8.73*	6 17	52 353	2.40	0.90-6.35	7 27	51 344	1.75	0.72-4.22
Using laptop computers	14 5	313 98	0.88	0.31-2.50	17 6	310 96	0.87	0.34-2.29	28 6	299 97	1.51	0.61-3.76
Using tablet computers	6 13	57 354	2.87	1.05-7.85*	7 16	56 350	2.73	1.08-6.95*	6 28	57 339	1.27	0.51-3.22
Using mobile phones	19 0	404 7	0.96	0.94-0.98	22 1	400 6	0.33	0.04-2.86	34 0	389 7	0.92	0.89-0.97
No. of devices	>2 <=2	173 237	2.35	0.91-6.09	15 8	170 235	2.59	1.07-6.25*	20 14	165 230	1.99	0.98-4.06

Chi-square statistics *Significant associations (p < .05)

Table 7: Associations of health problems with screen time (Pain in eyes, Stress level and BMI)

	Pain in eyes (n=430)				Stress level (n=430)				BMI (n=426)			
	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI	Often	Not Often	OR	95%CI
Viewing TV, videos on a weekday	31 21	183 195	1.57	0.87-2.83	71 79	143 137	0.86	0.57-1.28	34 37	179 176	0.90	0.54-1.51
Viewing TV, videos on a day during weekend	24 28	136 242	1.53	0.85-2.74	54 96	106 174	0.92	0.61-1.39	23 48	137 218	0.76	0.44-1.31
Playing videogames on a weekday	18 34	94 284	1.60	0.86-2.97	45 105	67 213	1.36	0.87-2.12	25 46	87 268	1.67	0.97-2.88
Playing videogames on a day during weekend	17 35	95 283	1.45	0.78-2.70	42 108	70 210	1.17	0.75-1.83	26 45	86 269	1.81	1.05-3.10*
Using internet on a weekday	32 20	168 210	2.00	1.10-3.62*	67 83	133 147	0.89	0.60-1.33	33 38	165 190	1.00	0.60-1.67
Using internet on a day during weekend	31 21	160 218	2.01	1.15-3.63*	75 75	116 164	1.41	0.95-2.11	35 36	155 200	1.25	0.75-2.09
Total screen time per weekday	34 18	174 204	2.22	1.21-4.06*	77 73	131 149	1.20	0.81-1.78	33 38	173 182	0.91	0.55-1.52
Total screen time per day during weekend	30 22	157 221	1.92	1.07-3.45*	72 78	115 165	1.32	0.89-1.97	30 41	156 199	0.93	0.56-1.56
Using social media	28 24	168 210	1.46	0.82-2.61	72 78	124 156	1.16	0.78-1.73	33 38	162 193	1.04	0.62-1.73
Using TV	23 29	146 232	1.26	0.70-2.26	61 89	108 172	1.09	0.73-1.64	29 42	139 216	1.07	0.64-1.80
Using desktop computers	9 43	49 328	1.40	0.64-3.05	27 23	31 248	1.76	1.00-3.07*	11 60	46 308	1.23	0.60-2.51
Using laptop computers	39 13	288 90	0.94	0.48-1.83	105 45	222 58	0.61	0.39-0.96	52 19	273 82	0.82	0.46-1.47
Using tablet computers	8 44	55 323	1.07	0.48-2.39	24 126	39 241	1.17	0.68-2.05	17 54	46 309	2.12	1.13-3.96*
Using mobile phones	52 0	371 7	0.88	0.85-0.91	149 1	274 6	3.26	0.39-27.4	71 0	348 7	0.83	0.79-0.87
No. of devices	>2	26	1.37	0.77-2.45	68	117	1.15	0.77-1.71	35	149	1.34	0.80-2.23
	≤2	26			82	162			36	205		

Chi-square statistics *Significant associations (p < .05)

Health problems

Subjective physical health problems were considered for a period of one month. Associations of these health problems with screen time are presented in Tables 5, 6, and 7. The most common health problem that the participants had reported as 'very often' was headache. Of 430 participants, 97 (22.6%) reported that they had headache very often followed by some time (n=211, 49.1%) and rarely (n=98, 22.8%) respectively. Only 24 (5.6%) reported that they never had headaches during the past month.

Only 19 (4.4%) reported that they had backache very often, followed by sometimes (n=135, 31.5%), rarely (n=166, 38.7%) and never (n=109, 25.4%) respectively. Some participants felt low very often (n=57, 13.3%), sometimes (n=182, 42.5%), rarely (n=126, 29.4%) and never (n=63, 14.7%) during the past month. A substantial number of participants never had any musculoskeletal pain such as neck pain and shoulder pain during the past month compared to the categories of very often, sometimes, or rarely (Table 4). Some participants (n=171, 39.8%) had a moderate level of stress during university life while 12.6% (n=54) of them had experienced 'extremely severe' stress, followed by 22.3% (n=96) 'severe', 7.7% (n=33) mild and 17.7% (n=76) 'normal' levels of stress respectively.

Of the 430 participants, more than half (n=256, 59.5%) experienced a sleep duration less than seven hours and only 40.5% (n=174) had seven or more hours of sleep during a night. When considering sleep latency, 44.4% (n=191) of participants had a duration of 30 minutes or more time and 55.6% (n=239) had 'normal' sleep latency lower than 30 minutes.

Excessive usage of the internet both on weekdays (OR=1.78, 95% CI=1.21-2.62) and weekends (OR=1.86, 95% CI=1.26-2.73), excessive total screen time on weekdays (OR=1.61, 95% CI=1.10-2.37), and excessive usage of

social media (OR =1.52, 95% CI=1.03-2.22) were significantly associated with higher sleep latency of more than 30 minutes. Usage of television (OR=1.67, 95% CI=1.19 -2.46), usage of desktop computers (OR=1.93, 95% CI=1.10-3.39), and using of more than two devices (OR=1.51, 95% CI=1.02-2.21) were also significantly associated with higher sleep latency of more than 30 minutes. Usage of tablets was significantly associated with seeking medical advice for sleep disturbances (OR=4.46, 95% CI=1.63-12.2).

Some sleep quality indicators showed associations with 'screen time'. Excessive usage of the internet during weekends was significantly associated with difficulty of falling asleep often (OR=2.76, 95% CI=1.41-5.41). In addition, difficulty of falling asleep often (OR=2.05, 95% CI=1.07-3.92) during a day in the weekend was significantly associated with excessive total screen time too. Excessive usage of the internet during weekdays was significantly associated with often feeling of excessively or overly sleepy during the day (OR=1.56, 95% CI=1.03-2.36).

Discussion

According to the results of the current study, the mean screen time of undergraduates per weekday was 315.8 minutes (~5 hours) and 456.5 minutes per day during a weekend (~7.5 hours). This shows that screen time on a day during weekend was higher than on weekdays and it was consistent with previously published literature (Khouja et al., 2019, Bucksch et al., 2016). The current study further found that university students spent more time on the internet and television rather than playing video games both during weekdays and weekends.

A significant association between headache and the screen time was found in the present study. Further, excessive usage of internet during weekends and excessive total weekend screen time was associated with frequent headache. Similarly, Montagni et al. (2015) reported that

there had been an association between the higher levels of screen time exposure and recurrent headache. Excessive screen time leads to a reduction of free time for leisure activities and also it overloads the visual system which might contribute to trigger headaches (Xavier et al., 2015). Although a study conducted in Pakistan (Fatima et al., 2021) showed associations between higher levels of screen time and backache, the results of the present study showed that there were no such associations.

The present study found that various screen time activities had significant relationships with neck pain and shoulder pain. Similarly, Al-Dubai et al., (2013) found that long hours spent on surfing social media was significantly associated with experiencing musculoskeletal problems such as back pain, shoulder pain, and neck pain. This may be due to the excessive usage of shoulders for operating electronic devices while keeping the upper limbs in a static posture. The current study also showed that using tablet computers had an association with shoulder pain. The reason for this might be the strain on shoulders when using the tablets. Further, a previous study revealed that using tablet computers had caused various musculoskeletal problems than using desktops (Straker et al., 2008). A significant association between the usage of higher number of screen devices and a frequent pain in the shoulders was found in the current study. Similarly, an association was found between the usage of both desktop computers and tablet computers with frequent neck pain (Hakala et al., 2006)

Playing video games was found to be associated with hand pain in the current study. Excessive usage of the internet, social media, and excessive weekend screen time had also shown significant associations with 'often' hand pain. A Danish study by Jensen et al. (2002) also highlighted that long hours of computer usage was associated with musculoskeletal symptoms such as shoulder, neck, and hand/ wrist pain. Further, the authors suggested that it may be due to repetitive

movements of the hand in using the computer in static or awkward postures all the time at work.

An association between the excessive internet usage and the excessive screen time with pain in the eyes was found in the current study, may be due to looking at a screen for a long time leading to eye strain. Previous studies also have provided evidence that screen time behavior causes significant vision complaints (Ranasinghe, et al., 2016; Meo-Al-Drees, 2005).

Playing videogames was significantly associated with being overweight and obese in the current study. Screen time activities including video games generally lead to sedentary behavior which might be a cause for overweight. Similarly, Hammoudi et al. (2021) reported that increased duration of smartphone use was associated with BMI more than 25.

The findings of the present study indicated that excessive screen time, excessive usage of the internet, and excessive usage of social media had an association with a higher sleep latency of more than 30 minutes. Tavernier and Willoughby (2014) also described that spending longer time watching television and engaging in social networking websites lead to sleep problems. Further, screen time was associated with some indicators of sleep quality in the current study. Excessive internet usage on weekdays was associated with feeling excessively or overly sleepy during the day and total screen time and excessive internet usage during weekends were associated with difficulty of falling asleep. This shows that higher screen time can cause sleep problems leading to lower sleep quality as evidenced by previous studies (Parent et al., 2016; Vallance et al., 2015).

Interestingly, the current study found that excessive time on social media was associated with feeling low and higher sleep latency. This result is consistent with Hawi & Samaha (2017) who found that excessive time on social media is directly related to lower self -

esteem. It was evident that when someone is engaged in upward social comparisons and receiving negative feedback through social media, both the mood and self-esteem of that person become low (Vogel et al., 2014). On the other hand, lower feelings of one's own-self among heavy social media users can be due to their poor sleep quality (Woods & Scott, 2016).

However, the findings of this study may still have limitations because the data were collected conveniently without considering the study programs followed by the participants from different faculties of the university where some students engage more in computer usage. Additionally, the descriptive nature of the study and self-report method of data collection might have recall biases especially about physical symptoms in the past months. Despite these limitations, the findings of this study may shed light on the screen time behavior of university students that might be useful for both academics as well as the undergraduates themselves.

Conclusions

The main findings of this study revealed that university students have higher screen time during both weekdays and weekends, while weekend screen time was higher than on weekdays. Majority of them used one or more electronic devices for different purposes and consequently they experienced physical problems related to screen time behavior. Excessive total screen time during weekends and excessive weekend internet use were associated with headaches. Some of the screen time activities have shown associations with pain in shoulder, neck, hand and eyes. Higher levels of screen time had also shown significant associations with higher sleep latency and poor sleep quality. Thus, all these findings indicated that higher screen time can lead to a variety of health problems. Undergraduates should take actions to limit their screen time to prevent such problems. Further studies are required to identify problems related to

screen time and screen time behaviors among undergraduates.

Funding statement

This research received no specific grant from any funding agency.

Conflict of interest

The authors declare that they have no conflict of interests.

References

- Akulwar-Tajane, I., Parmar, K. K., Naik, P. H., & Shah, A. V. (2020). Rethinking screen time during COVID-19: impact on psychological well-being in physiotherapy students. *Int J Clin Exp Med Res*, 4(4), 201-216. <https://doi.org/10.26855/ijce-mr.2020.10.014>
- Aust, L. A., Bockman, S. A., & Hermansen-Kobulnicky, C. J. (2019). One click away: pilot study of the perceived academic impact of screen time among pharmacy students. *Currents in Pharmacy Teaching and Learning*, 11(6), 565-570. <https://doi.org/10.1016/j.cptl.2019.02.019>
- Al-Dubai, S. A. R., Ganasegeran, K., Al-Shagga, M. A. M., Yadav, H., & Arokiasamy, J. T. (2013). Adverse health effects and unhealthy behaviors among medical students using Facebook. *The scientific world journal*, 2013. <https://doi.org/10.1155/2013/465161>
- Boniell-Nissim, M., Lenzi, M., Zsiros, E., de Matos, M. G., Gommans, R., Harel-Fisch, Y., Djalovski, A. & van der Sluijs, W. (2015). International trends in electronic media communication among 11-to 15-year-olds in 30 countries from 2002 to 2010: association with ease of communication with friends of the opposite sex. *The European Journal of Public Health*, 25(suppl_2), 41-45. <https://doi.org/10.1093/eurpub/ckv025>
- Busch, V., Manders, L., A., & de Leeuw, J. R., (2013). Screen time associated with health behaviors and outcomes in adolescents. *American Journal of Health Behavior*, 37(6), 819-830. <https://doi.org/10.5993/AJHB.37.6.11>
- Bucksch, J., Sigmundova, D., Hamrik, Z., Troped, P. J., Melkevik, O., Ahluwalia, N., Borraccino A., Tynjälä j., Kalman M., & Inchley, J. (2016). International trends in adolescent screen-time behaviors from 2002 to 2010. *Journal of Adolescent Health*, 58(4), 417-425. <https://doi.org/10.1016/j.jadohealth.2015.11.014>
- Carter, B., Rees, P., Hale, L., Bhattacharjee, D.,

- & Paradkar, M. S. (2016). Association between portable screen-based media device access or use and sleep outcomes: a systematic review and meta-analysis. *JAMA pediatrics*, 170(12), 1202 - 1208. <https://doi.org/10.1001/jamapediatrics.2016.2341>
- Fatima, A., Ansari, S. K., Waqar, H., & Jameel, A. (2021). Determine augmented risk association between health problems and screen exposure to electronic gadgets in university students, Islamabad during COVID -19 pandemic. *Innovation*, 2(2), 22-26. <https://doi.org/10.11648/j.inov.20210202.11>
- Hakala, P. T., Rimpelä, A. H., Saarni, L. A., & Salminen, J. J. (2006). Frequent computer - related activities increase the risk of neck-shoulder and low back pain in adolescents. *The European Journal of Public Health*, 16(5), 536-541. <https://doi.org/10.1093/eurpub/ckl025>
- Hammoudi, S. F., Mreydem, H. W., Abou Ali, B. T., Saleh, N. O., Chung, S., Hallit, S., & Salameh, P. (2021). Smartphone screen time among university students in Lebanon and its association with insomnia, bedtime procrastination, and body mass index during the COVID-19 pandemic: A cross-sectional study. *Psychiatry Investigation*, 18(9), 871. <https://doi.org/10.30773/pi.2021.0120>
- Hawi, N. S., & Samaha, M. (2017). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review*, 35(5), 576-586. <https://doi.org/10.1177/0894439316660340>
- Jensen, C., Ryholt, C.U., Burr, H., Villadsen, E., & Christensen, H. (2002). Work - related psychosocial, physical and individual factors associated with musculoskeletal symptoms in computer users. *Work & Stress*, 16(2), 107-120. <https://doi.org/10.1080/02678370210140658>
- Khouja, J. N., Munafò, M. R., Tilling, K., Wiles, N. J., Joinson, C., EtcHELLS, P. J., ... & Cornish, R. P. (2019). Is screen time associated with anxiety or depression in young people? Results from a UK birth cohort. *BMC public health*, 19(1), 1-11. <https://doi.org/10.1186/s12889-018-6321-9>
- Maher, C., Olds, T. S., Eisenmann, J. C., & Dollman, J. (2012). Screen time is more strongly associated than physical activity with overweight and obesity in 9 - to 16 - year-old old Australians. *Acta Paediatrica*, 101(11), 1170-1174. <https://doi.org/10.1111/j.1651-2227.2012.02804.x>
- Marques, A., Calmeiro, L., Loureiro, N., Frasilho, D., & de Matos, M. G. (2015). Health complaints among adolescents: Associations with more screen-based behaviours and less physical activity. *Journal of Adolescence*, 44, 150-157. <https://doi.org/10.1016/j.adolescence.2015.07.018>
- Meo, S. A., & Al-Drees, A. M. (2005). Mobile phone related-hazards and subjective hearing and vision symptoms in the Saudi population. *International Journal of Occupational Medicine and Environmental Health*, 18(1), 53-57.
- Montagni, I., Guichard, E., Carpenet, C., Tzourio, C., & Kurth, T. (2015). Screen time exposure and reporting of headaches in young adults: A cross-sectional study. *Cephalalgia*, 36(11), 1020-1027. <https://doi.org/10.1177/0333102415620286>
- Orzech, K. M., Grandner, M. A., Roane, B. M., & Carskadon, M. A. (2016). Digital media use in the 2 h before bedtime is associated with sleep variables in university students. *Computers in Human Behavior*, 55,43-50. <https://doi.org/10.1016/j.chb.2015.08.049>
- Patrikakou, E. N. (2016). Parent involvement, technology, and media: now what?. *School Community Journal*, 26(2), 9-24.
- Parent, J., Sanders, W., & Forehand, R. (2016). Youth screen time and behavioral health problems: The role of sleep duration and disturbances. *Journal of Developmental and Behavioral Pediatrics: JDBP*, 37(4), 277. <https://doi.org/10.1097/DBP.0000000000000272>
- Ranasinghe, P., Wathurapatha, W. S., Perera, Y. S., Lamabadusuriya, D. A., Kulatunga, S., Jayawardana, N., & Katulanda, P. (2016). Computer vision syndrome among computer office workers in a developing country: an evaluation of prevalence and risk factors. *BMC Research Notes*, 9(1), 1-9. <https://doi.org/10.1186/s13104-016-1962-1>
- Sigman, A. (2012). Time for a view on screen time. *Archives of disease in childhood*, 97(11), 935-942. <https://doi.org/10.1136/archdischild-2012-302196>
- Straker, L. M., Coleman, J., Skoss, R., Maslen, B. A., Burgess-Limerick, R., & Pollock, C. M. (2008). A comparison of posture and muscle activity during tablet computer, desktop computer and paper use by young children. *Ergonomics*, 51(4), 540-555. <https://doi.org/10.1080/00140130701711000>
- Tavernier, R., & Willoughby, T. (2014). Sleep problems: predictor or outcome of media use among emerging adults at university?. *Journal of Sleep Research*, 23(4), 389-396. <https://doi.org/10.1111/jsr.12132>
- Torsheim, T., Eriksson, L., Schnohr, C. W., Hansen, F., Bjarnason, T., & Välimaa, R. (2010). Screen-based activities and physical complaints among adolescents from the Nordic countries. *BMC Public Health*, 10(1), 1-8. <https://doi.org/10.1186/1471-2458-10-324>
- Vallance, J. K., Buman, M. P., Stevinson, C., & Lynch, B. M. (2015). Associations of overall seden-

and screen time with sleep outcomes. *American Journal of Health Behavior*, 39(1),62-67.<https://doi.org/10.5993/AJHB.39.1.7>

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture*, 3(4), 206.

Woods, H.C., & Scott, H. (2016). # Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence*, 51, 41-49. <https://doi.org/10.1016/j.adolescence.2016.05.008>

Xavier, M. K. A., Pitangui, A. C. R., Silva, G. R. R., Oliveira, V. M. A. D., Beltrão, N. B., & Araújo, R. C. D. (2015). Prevalence of headache in adolescents and association with use of computer and videogames. *Ciencia & Saude Coletiva*, 20, 3477-3486.<https://doi.org/10.1590/1413-812320152011.19272014>