

Impact of Electronic Media Use on Sleep Quality and Fatigue: Comparison between Shift Work Nurses and Nursing Students

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Abstract

Given the extensive use of electronic media in all age-groups globally and lack of research among nurses on its impact on their sleep and fatigue, this study aimed to investigate the electronic media usage on sleep quality and fatigue in shift work nurses by comparing them with nursing students in Japan. Our study findings indicated an extremely high usage of electronic media, especially smartphones and cellphones, in both shift work nurses and nursing students, particularly before going to bed. Nursing students' screen times were significantly longer than that of nurses, and impacted their health levels. Nurses who used cellphones or smartphones for longer durations took significantly longer time to fall asleep than those who used them for shorter durations. Though sleep quality, sleep satisfaction, sleep duration, stress levels, fatigue levels, and health levels were not significantly different between the long duration group and the short duration group for screentime, both nurses and nursing students would benefit from restricting their screentime.

Keywords

Shift Work, Nurses, Nursing Students, Electronic Media, Sleep Quality

1. Background

Presently, electronic media, such as cellphones, smartphones, tablets, and computers are commonly used worldwide, not only by adults, but also by children and adolescents. Electronic media are often used for education and seeking information, but may impact people negatively, particularly by reducing life satisfac-

tion [1], affecting communication with family, quality of life, smoking, physical activity, and health [2]-[6]. Excessive media use has been shown to lead to insomnia in adolescents [7] [8]. American Academy of Pediatrics has proposed total media time for children as not more than 1- 2 hours per day of good quality programs [9]. It reported that to use media among adolescence associated with sleep duration and disturbance on their systematic review [10]. To watch a television in a child or adolescent's bedroom was related to delayed bedtimes [11] [12], shorter total sleep duration [13] [14].

Nurses work in stressful and demanding work environments, looking after patients for long hours and working in shifts [15], leading to higher stress in acuity areas [16]. Stress also decreases their work satisfaction [17]. In addition, shift work is associated the coronary heart diseases [18]-[22], hypertension [23], breast cancer [24] [25] and depression [26]. Humans are usually active in the daytime and sleep at night, following their circadian rhythm. Nurses working in shifts have irregular sleep patterns, and tend to nap before and after their night shifts. Nurses need high-quality sleep to recover from work-related fatigue. In addition, nurses may often use electronic media such as cellphones, smartphones, tablets, and computers that may affect their sleep quality and fatigue during shift work. However, research on the impact of electronic media use on sleep quality and fatigue in nurses are limited. Moreover, investigating these relationships is even more meaningful in nursing students, who will become future nurses. Therefore, this study aimed to investigate the effect of electronic media usage on the sleep quality and fatigue by drawing comparisons between nurses working in shifts and nursing students.

2. Methods

2.1. Design

This study used a descriptive correlation design employing self-administered surveys with nurses working in shifts and nursing students in Japan.

2.2. Participants and Setting

The first survey included 653 nurses working two shifts in a university hospital with approximately 900 beds and 26 nursing units including 700 full-time nurses, in Japan. From April 2014 to March 2015, this hospital delivered in-patient services to approximately 306,000 people and out-patient services to nearly 500,000 people. We excluded head nurses because they usually work in usual shifts. In addition, we excluded nurses regularly taking sleeping medicines as this would have impacted one of our measurements, sleep quality. The second survey included 323 nursing students from a university in Japan. The study was conducted between July and December, 2014.

2.3. Procedure

This study was approved to by the Institutional Review Board, Graduate School

of Health Sciences, Kobe University (approval number: 307). Questionnaires to nurses working in shifts were distributed via their respective head nurses/nurse managers, and were collected within the following two weeks.

Similarly, nursing students were distributed survey questionnaires via a researcher, and were collected within the following two weeks. Participation was voluntary and consent to participate was implied when completed surveys were submitted in sealed envelopes in designated collection bags.

2.4. Instruments

2.4.1. Circumstances of Using Electronic Media

We investigated circumstances of using electronic media during the day and two hours before going to bed. The circumstances of a cellphone or a smartphone were qualified to use watching the screen of them except to use as a telephone.

2.4.2. Sleep Quality

Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI) [27] Japanese version (PSQI-J). The PSQI is a self-administered questionnaire to ascertain sleep quality and quantity during the previous month. The PSQI has seven component scores: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, and daytime dysfunction. Each item is rated on a 0 - 3 scale. Total score ranges from 0 to 21 points where higher score means worse sleep quality. PSQI-J with cut-off points 5.5 was developed by Doi *et al.* in 1998 [28]. Cronbach's alpha of PSQI-J is 0.77, and its validity and reliability have already been verified [29].

2.4.3. Sleep Satisfaction

Sleep satisfaction of shift work nurses was investigated with visual analog scale (VAS). VAS consists of 10 cm (100 mm) horizontal direct line with one end indicating "extremely satisfied" and the other end showing "not satisfied at all". Participants indicated their present level of sleep satisfaction. VAS is widely used as a mental health measurement for anxiety, and can measure subjective mental state quantitatively and easily [30].

2.4.4. Stress, Fatigue, Health Levels

Current stress, fatigue, and health levels were investigated using a VAS similar to that measuring sleep satisfaction.

2.5. Statistical Analysis

Survey results were analyzed using IBM Statistics SPSS 25.0. An independent samples t-test, chi-square test, and Fisher's test were used to compare the basic characteristics of nurses and nursing students, as well as the presence or absence of electronic media viewing and time. In addition, an unpaired t-test was used to compare the long and short electronic media viewing time groups. The significance level was set at less than 0.05.

3. Results

In all, 435 nurses out of 653 responded to the questionnaire with a response rate of 66.4%. Thirty nurses were excluded because they reported using sleep inducing medicines. Finally, responses of 405 nurses were analyzed in this study. For nursing students, 260 out of 323 responded to the survey with a response rate of 80.5%. Eleven nursing students who regularly took sleep medication were excluded for not meeting the inclusion criteria. Therefore, data for 249 nursing students were analyzed in this study.

3.1. Characteristics, Lifestyle, and Sleep Quality among Shift Work Nurses and Nursing Students

Nurses' mean age was 29.3 ± 6.8 (mean \pm SD) years, while nursing students' mean age was 21.0 ± 2.6 ($t = 22.085$, $p = 0.000$). In terms of gender, 91.5% of the nurses and 94.7% of the nursing students were women ($\chi^2 = 2.324$, $p = 0.127$). In addition, 70.3% of the nurses and 59.3% of the nursing students were living alone ($\chi^2 = 14.048$, $p = 0.000$). In terms of their health, 22.1% of the nurses and 32.7% of the nursing students exercised regularly ($\chi^2 = 8.805$, $p = 0.003$) and 6.5% of the nurses and 1.9% of the nursing students had a body mass index (BMI) of more than 25 ($p = 0.008$) (Table 1).

Table 1. Characteristics shift work nurses and nursing students.

	Shift work nurses (N = 405)	Nursing students (N = 249)	T/ χ^2	p-value	
Age, y, median [QI; quartile range]	29.3 ± 6.8	21.0 ± 2.6	22.085	0.000***	
Sex, no. (%)	Male	34 (8.5)	13 (5.3)	2.324	0.127
	Female	368 (91.5)	234 (94.7)		
Living with someone, no. (%) ^{††}	Living with someone	118 (29.5)	100 (40.7)	14.048	0.000***
	Living alone	277 (70.3)	146 (59.3)		
Usual exercising, no. (%) [†]	Exercise	88 (22.1)	81 (32.7)	8.805	0.003**
	Don't exercise	310 (77.9)	167 (67.3)		
Alcohol, no. (%) ^{††}	Drink	178 (44.2)	112 (51.4)	2.952	0.086
	Not drink	225 (55.8)	106 (48.6)		
Smoking, no. (%) ^{††}	Smoke	20 (5.0)	6 (2.5)	2.363	0.124
	Not smoke	384 (95.0)	235 (97.5)		
Body-mass index (kg/m ²), mean \pm SD [†]		20.5 ± 2.6	20.0 ± 1.9	2.656	0.008**
	≥ 25.0 , no. (%) ^{†††}	23 (6.5)	4 (1.9)		0.008**
	< 25.0 , no. (%)	329 (93.5)	207 (98.1)		

Continued

Present stress situation, VAS, mean \pm SD [†]	68.8 \pm 21.8	53.3 \pm 22.9	8.609	0.000***
Present fatigue situation, VAS, mean \pm SD [†]	71.5 \pm 19.8	58.1 \pm 22.3	7.702	0.000***
Present Health level, VAS, mean \pm SD [†]	52.8 \pm 21.5	59.7 \pm 23.1	-3.866	0.000***
Usual Times on sleep at night, minutes, mean \pm SD [†]	363.1 \pm 62.7	333.6 \pm 84.1	4.736	0.000***
Times to get to sleep at night, minutes, mean \pm SD [†]	25.6 \pm 21.0	17.3 \pm 18.9	5.022	0.000***
Satisfactory in a sleep usually, VAS, mean \pm SD [†]	47.3 \pm 23.5	51.5 \pm 23.6	-2.224	0.026*
PSQI score, mean \pm SD [†]	6.2 \pm 2.4	6.1 \pm 2.6	0.206	0.837
≤ 5.5 associated with good sleep quality, no. (%) ^{††}	142 (38.7)	98 (41.2)	0.372	0.542
> 5.5 associated with bad sleep quality	225 (61.3)	140 (58.8)		

VAS: Visual analog scale (mm); [†]: Independent samples T test; ^{††}: Chi-square test, ^{†††}: Fisher's exact test; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Nurses' present stress levels, as measured by VAS, were significantly higher than those of nursing students (68.8 \pm 21.8 vs 53.3 \pm 22.9) ($t = 8.609$, $p = 0.000$). Present fatigue level of nurses was higher than those of nursing students (71.5 \pm 19.8 vs 58.1 \pm 22.3) ($t = 7.702$, $p = 0.000$).

Further, nurses' sleep times were significantly longer than those of nursing students (363.1 \pm 62.7 min (6.1 \pm 1.0 h) vs 333.6 \pm 84.1 min (5.6 \pm 1.4 h)) ($t = 4.736$, $p = 0.000$). However, nurses' time to get to sleep (25.6 \pm 21.0 min) was significantly longer than that of the nursing students (17.3 \pm 18.9 min) ($t = 5.022$, $p = 0.000$). In addition, sleep satisfaction of nurses (47.3 \pm 23.5) was lower than that of nursing students (51.5 \pm 23.6) ($t = -2.224$, $p = 0.026$).

For sleep quality, the scores of the PSQI-J between nurses (6.2 \pm 2.4) and nursing students (6.1 \pm 2.6) did not show any significant differences ($t = 0.206$, $p = 0.837$). Cut-off score of 5.5 on PSQI between both the groups also did not show any significant difference ($\chi^2 = 0.372$, $p = 0.542$).

3.2. Electronic Media Use among Shift Work Nurses and Nursing Students

Overall, 97.7% nurses and 100% nursing students routinely used electronic media ($p = 0.013$) (Table 2). Moreover, 92.7% nurses and 94.8% nursing students used electronic media, primarily, the cellphone, two hours before going to bed ($\chi^2 = 1.051$, $p = 0.305$). The electronic media usage was the longest on the cellphone or a smartphone in both groups. The average usage time of cellphone or a smartphone

in nursing students (216.8 ± 155.5 min (3.6 ± 2.6 h)) was significantly higher than that in nurses (142.9 ± 102.1 min (2.4 ± 1.7 h)) ($t = -6.589$, $p = 0.000$). The mean of times using a cellphone or smartphone, two hours before going to bed in nurses (55.1 ± 39.3 minutes) was significantly longer than the times (46.6 ± 27.6 minutes) in nursing students ($t = 3.097$, $p = 0.002$).

Table 2. Comparison shift work nurses and nursing students on using medias.

	Shift work nurses (N = 405)	Nursing students (N = 249)	T/ χ^2	p-value
Using media usually ^{†††}				
Use electronic media usually	390 (97.7)	247 (100.0)		0.013**
Not use electronic media usually	9 (2.3)	0 (0.0)		
Use Electronic Media before go to sleep at night ^{††}				
Use electronic media before go to sleep at night	369 (92.7)	235 (94.8)	1.051	0.305
Not use electronic media before go to sleep at night	29 (7.3)	13 (5.2)		
Using media usually				
Cellphone or smartphone, minutes, mean \pm SD [†]	142.9 ± 102.1	216.8 ± 155.5	-6.589	0.000***
Tablet, minutes, mean \pm SD [†]	5.6 ± 30.6	3.9 ± 19.9	0.802	0.423
Computer, minutes, mean \pm SD [†]	49.7 ± 104.7	32.9 ± 71.6	2.394	0.017*
Game machine, minutes, mean \pm SD [†]	2.3 ± 15.3	1.3 ± 10.1	0.947	0.344
TV, minutes, mean \pm SD [†]	97.7 ± 114.1	56.8 ± 73.4	5.488	0.000***
Using media within 2 hours before go to bed				
Cellphone or smartphone, minutes, mean \pm SD [†]	55.1 ± 39.3	46.6 ± 27.6	3.097	0.002**
Tablet, minutes, mean \pm SD [†]	1.7 ± 11.7	1.4 ± 10.4	0.369	0.712
Computer, minutes, mean \pm SD [†]	4.9 ± 21.5	7.3 ± 24.2	-1.195	0.233
Game machine, minutes, mean \pm SD [†]	1.2 ± 9.5	0.8 ± 8.7	0.592	0.002**
TV, minutes, mean \pm SD [†]	27.3 ± 45.5	17.1 ± 35.0	3.090	0.002**

VAS: Visual analog scale (mm); [†]: Independent samples T test; ^{††}: Qui-square test, ^{†††}: Fisher's exact test; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.3. The Association of Screen Time on Smartphone with Sleep Quality and Fatigue among Nurses and Nursing Students

We compared the long screentime duration group (above the median time, all day) with the short duration group (under the median time) in nurses (Table 3). We also compared both the groups for two hours before going to bed. The long duration group (27.8 ± 22.7 min), who used a cellphone or a smartphone all day, took significantly longer time to fall asleep than the short duration group ($22.5 \pm$

17.6 min) ($t = -2.386$, $p = 0.018$). No significant differences were found in sleep quality, sleep satisfaction, sleep time, stress level, fatigue level, and health level between the long and short duration groups in nurses (**Table 3**).

Table 3. Association between length using cellphone and sleep quality on shift work nurses.

a) Comparison Sleep Quality with Length Using Cellphone for a Day					
		N	Mean \pm SD	T	p-value
PSQI score, mean \pm SD	short	126	6.1 \pm 2.3	-0.533	0.595
	long	228	6.2 \pm 2.4		
sleep satisfactory night, VAS, mean \pm SD	short	136	50.2 \pm 24.2	1.499	0.135
	long	246	46.5 \pm 23.1		
sleep satisfactory nap, VAS, mean \pm SD	short	135	48.6 \pm 24.8	0.243	0.808
	long	246	48.0 \pm 24.3		
stress level, VAS, mean \pm SD	short	136	69.1 \pm 20.4	0.167	0.867
	long	247	68.8 \pm 22.3		
fatigue level, VAS, mean \pm SD	short	136	71.4 \pm 20.9	-0.005	0.996
	long	247	71.4 \pm 19.2		
night fatigue, VAS, mean \pm SD	short	135	77.9 \pm 18.6	-0.007	0.995
	long	245	77.9 \pm 19.6		
healthy level, VAS, mean \pm SD	short	136	53.5 \pm 23.0	0.501	0.617
	long	247	52.3 \pm 20.4		
get to sleep time, minutes, mean \pm SD	short	135	22.5 \pm 17.6	-2.386	0.018*
	long	246	27.8 \pm 22.7		
sleep duration, minutes, mean \pm SD	short	136	364.3 \pm 58.9	0.218	0.828
	long	243	362.8 \pm 65.0		

Independent Samples T test; * $p < 0.05$.

b) Comparison Sleep Quality with Length Using Cellphone within 2 Hours before Going to Bed					
		N	Mean \pm SD	T	p
PSQI score, mean \pm SD	short	144	5.9 \pm 2.2	-1.265	0.207
	long	190	6.3 \pm 2.5		
sleep satisfactory night, VAS, mean \pm SD	short	154	49.0 \pm 23.6	1.289	0.198
	long	206	45.8 \pm 23.0		
sleep satisfactory nap, VAS, mean \pm SD	short	152	47.8 \pm 24.2	0.016	0.988
	long	207	47.8 \pm 24.2		

Continued

stress level, VAS, mean ± SD	short	154	68.3 ± 22.0	-0.571	0.568
	long	207	69.6 ± 21.3		
fatigue level, VAS, mean ± SD	short	154	72.0 ± 19.9	0.356	0.722
	long	207	71.3 ± 19.4		
night fatigue, VAS, mean ± SD	short	151	76.9 ± 19.6	-0.367	0.714
	long	207	77.7 ± 19.8		
healthy level, VAS, mean ± SD	short	154	52.1 ± 22.0	-0.437	0.663
	long	207	53.1 ± 20.6		
get to sleep time, minutes, mean ± SD	short	154	23.2 ± 18.3	-1.955	0.051
	long	206	27.6 ± 23.1		
sleep duration, minutes, mean ± SD	short	154	368.2 ± 60.3	1.229	0.220
	long	203	359.8 ± 66.3		

VAS: visual analog scale (mm); Independent Samples T test; The long duration group who used a cellphone or a smartphone for above the median time all day, the short duration group who used it for under the median time among nurses.

Similar comparisons were drawn for nursing students (**Table 4**). The long duration group scored significantly lower on health levels (57.3 ± 23.0) than the short duration group (64.3 ± 22.7) ($t = 2.292$, $p = 0.023$). Sleep quality, sleep satisfaction, sleep duration, stress level, fatigue level, and health level did show any significant differences between the long and short duration groups among nursing students.

Table 4. Association between length using cellphone and sleep quality on nursing students.

a) Comparison Sleep Quality with Length Using Cellphone for a Day					
		N	Mean ± SD	T	p-value
PSQI score, mean ± SD	short	88	5.9 ± 2.8	-0.766	0.445
	long	147	6.2 ± 2.4		
sleep satisfactory night, VAS, mean ± SD	short	93	52.9 ± 24.0	0.832	0.406
	long	150	50.3 ± 23.3		
stress level, VAS, mean ± SD	short	93	51.3 ± 25.0	-1.033	0.303
	long	150	54.4 ± 21.7		
fatigue level, VAS, mean ± SD	short	91	55.9 ± 23.4	-1.150	0.251
	long	150	59.3 ± 21.9		
healthy level, VAS, mean ± SD	short	91	64.3 ± 22.7	2.292	0.023*
	long	150	57.3 ± 23.0		

Continued

get to sleep time, minutes, mean \pm SD	short	91	17.9 \pm 19.7	0.442	0.659
	long	150	16.8 \pm 18.3		
sleep duration, minutes, mean \pm SD	short	91	336.9 \pm 78.2	0.458	0.647
	long	151	331.7 \pm 88.2		
Independent Samples T test; *p < 0.05.					
b) Comparison Sleep Quality with Length Using Cellphone within 2 Hours before Going to Bed					
		N	Mean \pm SD	T	P
PSQI score, mean \pm SD	short	111	6.1 \pm 2.6	-0.590	0.556
	long	113	6.3 \pm 2.5		
sleep satisfactory night, VAS, mean \pm SD	short	115	52.7 \pm 24.0	0.755	0.451
	long	115	50.3 \pm 23.2		
stress level, VAS, mean \pm SD	short	115	53.1 \pm 23.8	-0.407	0.685
	long	115	54.3 \pm 22.6		
fatigue level, VAS, mean \pm SD	short	115	58.6 \pm 21.9	0.202	0.840
	long	113	58.0 \pm 22.8		
healthy level, VAS, mean \pm SD	short	115	61.7 \pm 22.8	1.472	0.142
	long	113	57.1 \pm 23.7		
get to sleep time, minutes, mean \pm SD	short	114	16.6 \pm 19.9	-0.779	0.437
	long	115	18.6 \pm 18.7		
sleep duration, minutes, mean \pm SD	short	114	329.0 \pm 84.5	-0.505	0.614
	long	116	334.7 \pm 85.6		

VAS: visual analog scale (mm); Independent Samples T test; The long duration group who used a cellphone or a smartphone for above the median time all day, the short duration group who used it for under the median time among nurses.

4. Discussion

This study was conducted to clarify the effects of electronic media use on sleep quality and fatigue of shift work nurses and nursing students.

4.1. Sleep Quality and Fatigue among Nurses and Nursing Students

Nurses showed a significantly longer sleep time, but nursing students fell asleep earlier than nurses. There was no significant difference between the two groups in sleep quality but sleep satisfaction was higher in nursing students. Night shifts have been shown to affect sleep quality and fatigue in nurses, and nurses who work irregular shifts are more likely to fall asleep and have lower sleep quality than nursing students, who have a more regular life [31]. In addition, the quality of

sleep declines with age [32], and nursing students were younger than the nurses.

Nurses tend to adjust their sleep cycles so that they can secure around six hours of sleep daily despite their shifts. Contrarily, nursing students spend less time sleeping because they need to spend more time studying for university classes, and doing club activities or part-time jobs. However, in our study, compared to the nurses, nursing students slept faster and had a higher degree of sleep satisfaction, suggesting that despite shorter duration of sleep, they are getting a good night's sleep more than the nurses.

Nurses reported higher fatigue levels than nursing students. Nurses who work in hospitals experience more stress, primarily related to their patients' lives and mistakes that may directly affect their patients. Nurses also tend to have an irregular life, and hence experience high levels of stress and fatigue, owing to the demanding physical and mental aspects of their work. Despite sleeping longer than nursing students, they felt higher levels of fatigue in our study. Alertness and performance in nurses are impaired at nights compared to day shifts [33], and their fatigue may not be overcome by sleep alone. Apart from sufficient sleeping hours, nurses also need good sleep quality and relief from mental fatigue.

4.2. Electronic Media Use among Nurses and Nursing Students

Electronic media usage in both nurses and nursing students was extremely high, particularly before going to bed. Nursing students used cellphones or smartphones for more than 3.5 h, longer than that of nurses, and more often during the day, except during their classes, jobs, or activities, which might affect their sleep duration. Contrarily, nurses used cellphones or smartphones within two hours before going to bed, owing to their work. The long duration group, who used a cellphone or a smartphone all day, took significantly longer time to fall asleep than the short duration group among nurses; this might lead to their taking longer time to fall asleep than nursing students. Thus, nurses need to exercise moderation in screen time to improve the quality and quantity of their sleep. We need to verify that shift work nurses might use a cellphone or smartphone for shorter time before going to bed.

Mireku *et al.* showed that adolescents screen time at night was associated with their falling asleep later, waking up later, and sleeping for less time. It has been pointed out that light exposure from electronic media such as smartphones at night emits short wavelength (blue) light, which inhibits melatonin synthesis [34]. Lemola *et al.* showed that electronic media use was associated with sleep duration, sleep difficulties, and depression in adolescents [35]. In adults as well as adolescents, smartphone use has been reported to affect sleep quality and mental health, including depression and anxiety. Karas *et al.* also showed the association between smartphone addiction and depressive symptoms, anxiety, and poor sleep quality in older adults [36]. Thus, the use of electronic media such as smartphones can have an impact on people of all ages.

In addition, the long duration group scored significantly lower on health level

than the short duration group among nursing students, though there were not significant differences in sleep quality, sleep duration, fatigue, and stress. Moreover, nursing students tended to use cellphones or smartphones for more than 3.5 h a day, mostly in their free time, other than their classes, club activities, or part-time jobs. Excessive electronic media consumption can interfere with social interactions and activities and affect physical and mental health. They may thus benefit from restricting cellphone or smartphone usage to a shorter time.

In all, our findings showed that if nurses spend a long time watching mobile phones or smartphones before going to bed, it may affect the time it takes them to fall asleep. As a nurse's job involves the lives of patients, it is important to improve the quality of sleep and get sufficient rest. Nurses need to avoid excessive screentime before going to bed, as it may affect their ability to fall asleep. In shift work that involves night shifts, it is important to improve the quality of rest and sleep before and after work, recover from fatigue, and ensure that it does not affect the next shift. Hospitals should inform nurses about the importance of sleep and rest, and the appropriate use of electronic media. On the other hand, when university students become highly dependent on smartphones, their sleep quality deteriorates, and this impacts their academic performance [37]. Even among nursing students, increased reliance on electronic media such as smartphones has an undeniable impact on their academic performance. It may affect their concentration and work efficiency as nurses in future.

5. Conclusion

Our study findings indicated an extremely high usage of electronic media, especially smartphones and cellphones, in both shift work for nurses and nursing students, particularly before going to bed. Nursing students' screen times were significantly longer than that of nurses, and impacted their health levels. Nurses who used a cellphone or a smartphone all day (longer duration), took significantly longer time to fall asleep than those who used them for shorter durations. Though, sleep quality, sleep satisfaction, sleep duration, stress levels, fatigue levels, and health levels were not significantly different between the long and short duration groups, nurses must restrict their cellphone or smartphone use to shorter durations to improve their sleep patterns and quality. The same holds true for nursing students as they will be future nurses.

Limitations

This study has some limitations that must be considered. First, we investigated sleep quality only via PSQI scores; sleep duration, sleep satisfaction and could not investigate the usual sleep pattern. Additionally, this survey of sleep quality and electronic media watching time was self-reported, which limits the objective accuracy of the responses. Second, nursing students have a regular life pattern and usually sleep at night, unlike shift work nurses. Sleep pattern of shift work nurses, apart from screen time, might also affect their sleep quality. This correlation in

nurses must be investigated in future research. Third, participants of this study belonged to a single university and hospital; hence, generalization of our findings must be applied with caution. Furthermore, it is necessary to carefully consider confounding factors such as age, health status, and sleep disorders.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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