ORIGINAL ARTICLE

A Cross-sectional Study on Association of Smoking Habits and Insomnia Among University Students in Cyberjaya

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ABSTRACT

Introduction: Cigarette smoking has been particularly common among university students. Aside from that, there also has been a rise in prevalence of insomnia worldwide. This study aims to determine the prevalence and the association of cigarette smoking and insomnia among university students in Cyberjaya. **Methods:** A cross-sectional study was conducted to undergraduate students of University of Cyberjaya and Multimedia University in Cyberjaya, Selangor, which were selected via 3 different types of sampling methods. Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI) questionnaires were conducted via online survey. **Results:** 256 students from University of Cyberjaya (67.6%) and Multimedia University (32.4%) participated in the study with 40.2% being male and 59.8% female. Prevalence of smoking was 10.1% (N = 26). The ISI score reveals that 138 (53.9%) of the participants have insomnia. The global PSQI score revealed 85% (N = 215) have poor sleep quality. Among the smokers, 80.8% were identified to have insomnia, while based on PSQI, 100% of them have poor sleep quality. Significance associations were found between smoking and insomnia (p value = 0.004) along with association between smoking and sleep disturbance (p value = 0.019). **Conclusion:** Prevalence of poor sleep quality and insomnia is high among university students in Cyberjaya. Besides, the study also found significance in both association between smoking habits and sleep quality as well as association between smoking habits and insomnia.

Keywords: Sleep pattern, Insomnia, Smoking, University Students

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INTRODUCTION

Cigarette smoking is the major preventable killer in most countries and the number of smokers is still increasing (1). Global Adult Tobacco Survey (GATS) 2011 conducted in Malaysia has found that an adult Malaysian smoked 14 cigarettes per day on average (1). In cigarettes, there is nicotine which is an addictive stimulant that can cause nightly withdrawal symptoms related to poor sleep or even insomnia (2). Insomnia is characterized by "difficulty initiating or maintaining sleep, or nonrestorative sleep, and is associated with impairments of daytime functioning" (3).

Smoking-related sleep problems are linked to long-term smoking relapse (4). A study conducted in 2012 has reported that current smokers were more likely to experience insomnia symptoms (difficulties initiating and maintaining sleep) (5). This study rationalised the prevalence of insufficient sleep among current smokers with 17.8%, which are higher than those who have never smoked and former smokers with only 9.4% and 10% respectively (6). The aim of this study is to determine the prevalence and the association between cigarette smoking and insomnia among the students of two universities in Cyberjaya which are University of Cyberjaya (UoC) and Multimedia University (MMU).

MATERIALS AND METHODS

A cross-sectional study was conducted among the university students of two private universities in Cyberjaya, Selangor. The universities that we focused on were University of Cyberjaya (UoC) and Multimedia University (MMU). Data collection was conducted online via Google Forms for 5 days from 20 August 2020 until 14 August 2020. Two faculties from each university were involved in this study. They are Faculty of Medicine and Faculty of Pharmacy

of University of Cyberjaya, Faculty of Engineering and Faculty of Creative Multimedia of Multimedia University. Students in education level of foundation/diploma, undergraduates and postgraduates were randomly selected.

Inclusion criteria:
a) Students of University of Cyberjaya (UoC) and Multimedia University (MMU)
b) Aged 18 and above.

A sample size of 344 was calculated using one proportion formula: without finite population correction, based on the expected prevalence of insomnia among university students, 33.8%, and 95% level of confidence. Three types of sampling methods were used; stratified random sampling on both universities, systematic random sampling for 2 faculties from each university and simple random sampling of the students from those selected faculties.

Official letters were sent to both universities requesting for ethical approval before the online surveys will be conducted. The approval and ethical clearance from the University of Cyberjaya Research Ethics Review Committee (CRERC) and Multimedia University were granted upon commencement of this research project. [CRERC Reference Number: UOC/CRERC/ER/236.]. The confidentiality of the personal and other information of the respondents were ensured and not shared the obtained information to others and strictly for the study purpose only. Informed consent explaining the study purpose was filled by the respondent before participating in the survey.

Validated questionnaires were used in the study. We used;
i) Sociodemographic and smoking questionnaire (Pre-tested)
ii) Pittsburgh Sleep Quality Index (PSQI)
iii) Insomnia Severity Index (ISI)

Pre-test of the questionnaire was done using an online survey with the same method on 20 students of University of Cyberjaya. Those who have taken the pre-test were not included in the study.

Descriptive analysis was used to describe the sociodemographic factors of the respondents. Independent T-test was conducted to compare the means of the variables. For inferential analysis, Chi-square and multiple logistic regression were used to determine the association between insomnia and smoking habits of the students. All the statistical analysis were carried out by using SPSS version 23.

RESULTS

Sociodemographic factors
The highest age group respondents are 18-21 with 53.1%, followed by 46.5% for 22-25. The prevalence of females is higher with 59.8% whereas 40.2% for male. Malay has the highest prevalence with 78.5%. Malaysians are the majority of the respondents with 96.5% and Islam is the highest prevalence with 82.4%. The respondents of University of Cyberjaya students are 67.6% whereas the Multimedia University students are 32.4% and Faculty of Medicine had the highest prevalence with 51.2% (Table I).

Prevalence of smoking
Table II shows the prevalence of non-smokers is higher in UOC with 60.5% compared to MMU with 22.7%. MMU prevalence of current smokers is 6.6% slightly higher compared to UOC with 3.5%. The prevalence of ex-smokers is nearly the same for both universities as UOC with 3.5% and MMU with 3.1%.

Insomnia Severity Index (ISI) score
Table III portrays the majority of the respondents' absence in insomnia with 46.1%, 32.8% has subthreshold insomnia. 19.1% respondents have moderate insomnia and 2% have severe insomnia.

PSQI components
The highest prevalence in fairly good sleep quality with 44.1%. The sleep latency ≤ 15 min has the highest prevalence with 45.33%, followed by 16-30 min with 36.7%. 35.2% participants have sleep duration of 6 - 7 hours which shows the highest prevalence. Majority of the respondents have ≥ 85% sleep efficiency with 90.6%. 69.5% have mild sleep disturbances for the past month. The highest prevalence, 89.1% of the respondents do not take sleeping medication during the past months. 46.1% respondents experienced daytime dysfunction of less than once a week and the global PSQI score shows a third quarter of the participants have poor sleep quality (Table IV).

Association between smoking and sleep quality
Table V portrays the prevalence of smokers that have poor sleep are 100% while prevalence of non-smokers that have poor sleep is 83.0%. The data p-value is 0.019. There is a significant association between smoking and sleep quality.

Association between smoking and insomnia
The prevalence of the smokers that have insomnia is 19.2%. The p-value is 0.004. There is a significant and positive association between smokers and non-smokers with insomnia (Table VI).

Table I : Shows sociodemographic factors

Sociodemographic factor	Frequency, n	Percentage, %
Age group		
18-21	136	53.1
22-25	119	46.5
26-29	1	0.4
Total	256	100.0
Gender		
Male	103	40.2
Female	153	59.8
Total	256	100.0
Ethnicity		
Malay	201	78.5
Chinese	26	10.2
Indian	18	7.0
Others	11	4.3
Total	256	100.0
Citizenship		
Malaysian	247	96.5
Non-Malaysian	9	3.5
Total	256	100.0
Religion		
Islam	211	82.4
Hindu	17	6.6
Buddhist	16	6.3
Christian	11	4.3
Others	1	0.4
Total	256	100.0
University		
University of Cyberjaya	173	67.6
Multimedia University	83	32.4
Total	256	100.0
Faculty		
Faculty of Medicine	131	51.2
Faculty of Pharmacy	42	16.4
Faculty of Engineering	33	12.9
Faculty of Creative Multimedia	50	19.5
Total	256	100.0

Table II : Shows prevalence of smoking

Type of smokers	Frequency, n	Percentage, %
Non- smoker		
UOC	155	60.5
MMU	58	22.7
Total	213	83.2
Current smoker		
UOC	9	3.5
MMU	17	6.6
Total	26	10.1
Ex- smoker		
UOC	9	3.5
MMU	8	3.1
Total	17	6.6
Total	256	100.0

Table III : Shows Insomnia severity index (ISI) score

ISI score	Frequency, n	Percentage, %
Absence in insomnia	118	46.1
Subthreshold insomnia	84	32.8
Moderate insomnia	49	19.1
Severe insomnia	5	2.0
Total	256	100.0

DISCUSSION

Prevalence of smoking among students in two universities in this study is 10.1%, which is lower than the percentage obtained by the study conducted by Al-Naggar et al. (2011) in Malaysia, with 29% (7). A study involving 416 students in six universities in Sylhet division, Bangladesh has discovered that prevalence of tobacco smoking was 37.0% (8). Another study in Jazan, Saudi Arabia shows that the prevalence of ever smoking among students was 21.0% (9).

Our study found that the prevalence of insomnia among undergraduate students in Cyberjaya is 54.9%,

Table IV : Shows PSQI components

PSQI components	Frequency, n	Percentage, %
Subjective sleep quality		
Very good	58	22.7
Fairly good	113	44.1
Fairly bad	74	28.9
Very bad	11	4.
Total	256	100.0
Sleep latency		
≤ 15 min	116	45.33
16-30 min	94	36.7
31-60 min	39	15.2
> 60 min	7	2.7
Total	256	100.0
Sleep duration		
> 7 hours	80	31.3
6 – 7 hours	90	35.2
5 – 6 hours	51	19.9
<5 hours	35	13.7
Total	256	100.0
Sleep efficiency		
≥ 85%	232	90.6
75 – 84%	21	8.2
65 – 74%	3	1.2
< 65%	0	0
Total	256	100.0
Sleep Disturbance		
0 (none)	37	14.5
1-9 (mild)	178	69.5
10-18 (moderate)	39	15.2
19-27 (severe)	2	0.8
Total	256	100.0
Take sleeping medication		
Not during the past months	228	89.1
Less than once a week	15	5.9
Once or twice a week	10	3.9
Three or more times a week	3	1.2
Total	256	100.0
Daytime dysfunction		
Not during the past months	64	25.0
Less than once a week	118	46.1
Once or twice a week	65	25.4
Three or more times a week	9	3.5
Total	256	100.0
Global PSQI score		
Good sleep quality (0 - 5)	41	15.0
Poor sleep quality (> 5)	215	85.0
Total	256	100.0

Table V : Shows association between smoking and sleep quality

Smoking	Sleep quality		Total n (%)	p-value
	Good, n (%)	Poor, n (%)		
Yes	0 (0.0)	26 (100.0)	26 (100)	
				0.019
No	39 (17.0)	191 (83.0)	230 (100)	

Table VI : Shows association between smoking and insomnia

Smoking	Insomnia		Total n (%)	p-value
	Yes, n (%)	No, n (%)		
Yes	5 (19.2)	21 (80.8)	26 (100)	
				0.004
No	113 (49.1)	117 (50.9)	230 (100)	

which shows a lower percentage of insomnia among undergraduate university students than the study done in Debre Berhan University, Ethiopia by Haile et al. with the prevalence of 61.6% (11). Our findings in this study may be different due to different faculties being focused for each study as well as different instruments were used in those studies where Haile et al. used PSQI whereas our study used Insomnia Severity Index in determine the prevalence of insomnia among university students, which may have different methods of evaluations in determining the prevalence. Among 256 respondents, 118 (46.1%) have no insomnia, 84 (32.8%) have subthreshold insomnia, 49 (19.1%) have moderate insomnia and 5 (2.0%) have severe insomnia. These findings also show higher percentages compared to the study done by Choueiry et al. in 2016 (12) in Saint-Joseph University, Lebanon. They have found that 27.9% had no insomnia (ISI 0–7), 61.5% had subthreshold insomnia (ISI 8–14) and 10.6% had clinically significant insomnia (ISI > 14) (12). The difference in terms of result may be due to different faculties being taken as subjects of the study. Choueiry et al. only focused on students who were in medicine-related faculties from one university only. Whereas our study involved 4 faculties in both medicine-related faculties and non-medicine related faculties from 2 different universities.

Twenty-five percent of students have reported on getting less than 6.5 hours of sleep a night, and only 29.4% of students reported getting 8 or more hours of total sleep time per night, the average amount required for young adults (13) compared to this study, 35.2% students sleep for 6 to 7 hours and the highest prevalence and followed by sleep more than 7 hours with 31.3%. The study also portrays 69.5% of the respondents have mild sleep disturbance, 15.2% and 0.8% have moderate

and severe sleep disturbance respectively. A study in 2019 noted that 53.9% of respondents had sleeping difficulties due to frequent use of electronic media and gadgets like cell phone, laptop and television (14). This finding is parallel to a study done among junior college students in China which concluded that higher interaction levels for online interpersonal relationships causes poorer sleep quality (15).

Another cross-sectional study conducted in public medical university of Karachi, Pakistan involving undergraduate students noted that 64.24% of the students have poor sleep quality (16). A study in the United Kingdom on student-athletes shows 67% (n = 49) of the population were identified as "poor sleepers" (17). Meanwhile, this study which was participated by science students shows a third quarter of them have poor sleep quality based on the Global PSQI score.

Based on the study we have conducted, we found that there is a significant association between insomnia and cigarette smoking with p-value of 0.004. This finding is consistent with the study done in Fortaleza, Brazil involving 662 undergraduate students, which identified that there is a positive and statistically significant association between poor quality of sleep and daily smoking (18). A more recent study in 2020 also found that smoking was associated with increasing insomnia severity, with p-value of <0.001 (19).

Our study also revealed that 50.9% of non-smokers are having insomnia. This may be due to being stressed over assignment workloads in their respective universities or personal issues as well as having mental health problems, such as depression and anxiety. This statement is supported by a study carried out in Michigan, United States of America, which found that stress exposure was significantly associated with insomnia (20). Another research in Tarnobrzeg, Poland showed that many patients begin insomnia as a result of a stressful situation related to family problems, professional, school, health, or as a result of lifestyle changes (21).

CONCLUSION

It was concluded that the prevalence of poor sleep quality and insomnia is high among university students in Cyberjaya. Not only that, there is significance for association of smoking habits and sleep quality as well as association of smoking habits and insomnia. It is important to note that our study does not reflect all university students due to small sample size. Hopefully, there will be more further studies conducted which could include an exploration of other possible psychosocial factors that affect sleep patterns among university students using standardized tools.

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