Original Research

ASSOCIATION BETWEEN SLEEP QUALITY AND ACADEMIC PERFORMANCE AMONG PRIVATE UNIVERSITY STUDENTS DURING COVID-19 ENDEMIC IN CYBERJAYA, MALAYSIA

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ABSTRACT

Introduction: Malaysia was struck by the Covid-19 pandemic in 2020 which left a significant impact on the population. Since then, the aftereffects especially poor sleep quality are still affecting us. Thus, this study aims to assess the sleep quality of students at the University of Cyberjaya (UOC) post-COVID-19 pandemic and its relation to students' academic performance. This study aimed to assess any association between students' sociodemographic factors and sleep quality. This is a cross-sectional study where a convenience sampling technique was used. **Methods:** The study population consisted of 350 students comprised of those aged 18 years and above, and currently a student at the University of Cyberjaya while those that were diagnosed with health issues were excluded. A validated self-rated questionnaire, the Pittsburgh Sleep Quality Index (PSQI) was used to assess students' sleep quality. A global PSQI score holds a diagnostic sensitivity of 89.6% and a specificity of 86.5% to differentiate good and poor sleepers. Sociodemographic background questions of students' and respective semester cumulative grade point average (CGPA) were self-reported. **Results:** Our results revealed that 83.4% (292) of the students had poor sleep quality while 16.6% (58) had good sleep quality. However, there is no meaningful association between sociodemographic factors, sleep quality, and academic performance. Although, those with good academic performance had better sleep quality than those who achieved excellent grades. **Conclusion:** most UOC students reported poor sleep quality, but interestingly this does not affect their academic performance.

Keywords: COVID-19, sleep quality, academic performance, Pittsburgh Sleep Quality Index (PSQI), Malaysia.

Introduction:

Sleep is essential for our physical and mental well-being. Adequate sleep refreshes and rejuvenates us after daily activities, keeping us alert and focused. It plays a critical role in maintaining good health and preventing illnesses. Insufficient or poor-quality sleep can lead to exhaustion, difficulty concentrating, disrupts clear thinking, and memory problems. Most adults need seven to nine hours of sleep each night for optimal well-being (Vorvick, 2022).

In 2020, the outbreak of the COVID-19 pandemic prompted the Malaysian government to implement a Movement Control Order (MCO) (Yusof, 2021). Unfortunately, the pandemic and its measures also brought stress, anxiety, and sleep disturbances to many. Restrictions, social distancing, and limited activities increase the risk of sleep disorders, depression, and social isolation (Wan Mohd Yunus et al., 2021).

Malaysia was not exempt from the pandemic's negative impacts, with around 70% of surveyed individuals experiencing sleep disorders (Marzo et al., 2021). Among the most vulnerable were undergraduate students. The shift to online learning and uncertainties affected their sleep patterns and mental well-being (Marelli et al., 2020). As the pandemic becomes endemic, it is crucial to identify any lingering negative effects on students' sleep quality and its association with academic performance. We would also like to identify any association between sociodemographic characteristics of students and sleep quality. Understanding this can lead to targeted interventions among specific groups of students and curriculum adjustments to support students' well-being and academic success.

Methods

Study design

This cross-sectional study was conducted at the University of Cyberjaya, Selangor, Malaysia to gather data regarding sleep quality during Covid 19 pandemic amongst students and its potential association with academic performance. Data was taken within one year post-pandemic, from 25.6.22 to 9.6.23.

Study participants

The population for this study comprised students at the University of Cyberjaya. The inclusion criteria for participants were 18 years old and above and currently a student at the university. The age criterion ensured that participants were legally competent to provide informed consent.

Participants who had been diagnosed with health issues were excluded from the study. This exclusion criterion aimed to focus on students' sleep patterns and academic performance in the absence of significant underlying health conditions that could independently impact sleep quality.

Sampling Method

A convenience sampling method was used to recruit participants. A Google Form questionnaire was distributed via various social media platforms.

Questionnaire

The questionnaire was divided into three parts:

1. PART A: Sociodemographic data

   Nine sociodemographic factors were asked, which were age, gender, faculty of study, year of study, ethnicity, BMI, place of stay during the academic semester, monthly household income, and smoking status.

   Body Mass Index (BMI) is categorized into four underweight (< 18.5 kg/m^2), normal (18.5-24.9 kg/m^2), overweight (25.0-29.9 kg/m^2), and obese (> 30.0 kg/m^2) (CDC, 2022). Smoking status is classified into three groups which are current smokers, ex-smokers, and non-smokers. A current smoker is a person who currently smokes at least one tobacco product per day over a period of one month or more or a person who currently smokes less than daily. Respondents who are currently a non-smokers but had previously smoked daily is labeled as an ex-smoker and lastly, a non-smoker is a person who does not smoke at all (NHMS, 2015). Monthly Household Income is divided into three strata, the bottom 40% (B40), the middle 40% (M40), and the top 20% (T20). Median monthly household income is less than RM4849 for the B40 group, RM4850- RM10959 for the M40 group, and more than RM10960 for the T20 group (DOSM, 2019).

2. PART B: Sleep Quality

   Pittsburgh Sleep Quality Index (PSQI) is a validated questionnaire consisting of seven components which are subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction. Each component scored from 0 (no difficulty) to 3 (severe difficulty). The sum of these component scores (0-21) results in the global PSQI score, where higher scores indicate poorer sleep quality. Sleep quality outcomes were categorized as poor (PSQI score ≥ 5) or good (PSQI score < 5) (Buysse DJ et al., 1989).

3. PART C: Academic Performance

   Data on participants' academic performance was obtained from their CGPA of their latest examination. Academic performance was categorized into four groups: excellent (CGPA=3.70-4.00), good (CGPA = 3.00-3.69), average (CGPA = 2.50-2.99), and poor (<2.50)(R Jalali et al., 2020)

Data analysis

Data acquired through the questionnaire was analyzed using Jeffrey's Amazing Statistic Program (JASP). Descriptive statistics was used to summarize the sociodemographic factors and status of sleep quality of the respondents. Chi-Square was utilized to determine the association between sociodemographic factors, academic performance, and sleep quality.

Results

A total of 350 University of Cyberjaya students participated in this study. A majority of the respondents were distributed between the ages of 21-30 years old (50.1%), female (71.1%), Malay (45.7%), from faculty of Medicine (33.4%), currently in their 1st year of study (38.9%), never smoked (89.1%), belong to the M40 household income group (35.4%), have a normal BMI (56.6%) and is staying at hostel with a roommate (42.3%).

The prevalence of poor sleep quality among the University of Cyberjaya students was found to be 292 (83.4%) with a global PSQI score of more than 5 as demonstrated in Table 1. Table 2 illustrates poorer sleep quality was observed among the 18-20 age group (84.8%), female (84.1%), Indian (84.7%), from faculty of Occupational Safety and Health (100%), currently in their 1st year of study (84.6%), categorized into obese BMI (88.2%), ex-smoker (95%), staying at hostel without a roommate during the academic semester (91.9%) and belong to the B40 household income group (87.7%). However, no association between sociodemographic factors and sleep quality was found (p>0.05)

Table 1: The distribution of sleep quality status of UOC students

Status of sleep quality	
Good n (%)	Poor n (%)
58 (16.6)	292 (83.4)

Table 2 : The distribution of sleep quality status by sociodemographic variables

Sociodemographic Variables	Status of Sleep Quality			Statistical test	
	Poor n (%)	Good n (%)	Total n (%)	χ2 (df)	P value
Age					
18-20	145(84.8)	26(15.2)	171(100)	0.82 (1)	0.502
21-40	147(82.1)	32(17.9)	179(100)		
Gender					
Male	81(81.8)	18(18.2)	99(100)	0.26 (1)	0.611
Female	211(84.1)	58(16.6)	251(100)		
Ethnicity					
Malay	132(82.5)	28(17.5)	160(100)	0.23 (3)	0.972
Indian	83(84.7)	15(15.3)	98(100)		
Chinese & Bumiputera	50(83.3)	10(16.7)	60(100)		
International	27(84.4)	5(15.6)	32(100)		
Faculty					

Medicine	97 (82.9)	20 (17.1)	117(100)	35.86 (6)	0.439
Pharmacy	63 (82.9)	13 (17.1)	76 (100)		
Psychology	47 (75.8)	15 (24.2)	62 (100)		
Allied Health Sciences	46 (88.5)	6 (11.5)	52 (100)		
Occupational Safety and Health	7 (100)	0 (0)	7 (100)		
Foundation studies	11 (91.7)	1 (8.3)	12 (100)		
Others	21 (87.5)	3 (12.5)	24 (100)		
Smoking Status					
Never Smoked	259(82.7)	54 (17.3)	313(100)	2.06 (2)	0.358
Smoker	14 (82.4)	3 (17.6)	17 (100)		
Ex-smoker	19 (95.0)	1 (5.0)	20 (100)		
Monthly Household income					
B40(<RM 4849)	121(87.7)	17 (12.3)	138(100)	3.55 (2)	0.169
M40(RM 4850-10959)	98 (79.0)	26 (21.0)	124(100)		
T20(>RM10960)	73 (83.0)	15 (17.0)	88 (100)		
BMI					
Underweight	54 (85.7)	9 (14.3)	63 (100)	1.08 (3)	0.781
Normal	163(82.3)	35 (17.7)	198(100)		
Overweight	45 (81.8)	10 (18.2)	55 (100)		
Obese	30 (88.2)	4 (11.8)	34 (100)		
Place of Stay					
Hostel with roommate	122(82.4)	26 (17.6)	148(100)	2.90 (3)	0.407
Hostel without roommate	34 (91.9)	3 (8.1)	37 (100)		
Living with family	82 (84.5)	15 (15.5)	97 (100)		
Living alone	54 (79.4)	14 (20.6)	68 (100)		

Interestingly, students with average academic performance (CGPA (Cumulative Grade Point Average) = 2.5-2.99) were found to have the highest prevalence of poor sleep quality (85.7%) as compared to those with poor grades (81.3%) while those with good academic performance (CGPA = 3.0-3.69) had the highest prevalence of good sleep quality (86.3%) as compared to those who achieved excellent (26.0%) as shown in table 3. However, no significant association was found between the status of sleep quality and academic performance (p>0.05).

Table 3: Association between sleep quality and academic performance

Status of sleep quality	Academic performance				Statistical test
	Poor	Average	Good	Excellent	χ2 (df)
	n (%)	n (%)	n (%)	n (%)	
Poor	13(81.3)	30(85.7)	31 (13.7)	54 (74.0)	6.24 (3)
Good	3 (18.8)	5 (14.3)	195(86.3)	19 (26.0)	
Total	16 (100)	35 (100)	226 (100)	73 (100)	

Discussion

Out of 350 of our respondents, a significant majority of 292 students (83.4%) reported having poor sleep quality. This finding aligns with a study conducted by Romero-Blanco and colleagues, where ninety-five percent of nursing students suffered changes in their sleep patterns during the COVID-19 pandemic (Romero-Blanco et al., 2020). This indicates the pandemic has significantly impacted the sleep patterns of undergraduate students.

Among the 292 students, most of them are in the age group of 18-20, comprising those who recently entered tertiary education and are still adapting to their new academic environment. Similar to a study at Uludag University Faculty of Health Sciences CD of Nursing, where the first-year students were found to have the highest percentage (84.6%) of poor sleep quality due to though curriculum, family attention deprivation, and adaptation towards a new social environment (Yilmaz et al., 2017). This period of adjustment may be the contributing factor to their sleep difficulties.

Sleep quality was poorer among female students (84.1%) compared to male students, similar to a study conducted at the University of Muhammadiyah Malang, Hong Kong University, and Kathmandu Medical College where female students have a higher likelihood of poor sleep quality (71.5%, 65.7% and 48.2% respectively) (Marta et al., 2020; Suen et al., 2008; Sundas et al., 2020).

Although our study denoted those majoring in occupational safety and health (OSH) had the highest prevalence of poor sleep quality, this finding may be inaccurate as the group is underrepresented (n=7). As expected, a high proportion of medical students had poor sleep quality (82.9%). Similar studies conducted in Lithuania concluded that medical students had the highest prevalence of poor sleep quality (59.4%,) (Preišegolavičiūtė et al., 2010) while another similar study done in India showed medical students had a low prevalence of good sleep quality (47.1%) (Palatty et al., 2011) and reported a lower quality of life compared to students in other disciplines (Preišegolavičiūtė et al., 2010; Palatty et al., 2011). The demanding nature of medical studies, which often involve rigorous coursework, long hours of studying, and prominent levels of stress, all of which can significantly impact sleep patterns (Dyrbye et al., 2006).

However, despite conducting a thorough literature review, our study found that none of the sociodemographic factors were significantly associated with poor sleep quality, which contradicts previous research in this area. A study done in China and Korea displayed smokers had significantly poorer sleep than non-smokers (Hwang & Park, 2022; Liao et al., 2019).

Most of the students were from health care backgrounds, where they have been exposed to the disadvantages of smoking from a young age, hence the lower prevalence of smokers compared to other universities.

Similarly, we did not observe a significant correlation between poor sleep quality and its impact on academic performance, which contradicts a systemic clinical review conducted by Curcio Giuseppe et al. This comprehensive review found a close relationship between sleep quality and academic achievement. Poor sleep can impair students' cognitive functioning. For each hour of delay in reported rise time, the predicted GPAs could decrease by 0.13. Higher failure rates among poor sleepers (21%) compared to those with good sleep quality (11%) (Curcio et al., 2006). Interestingly, our findings highlight that a majority of those who attained excellent academic performance did not have good sleep quality (74%) which is consistent with a study done in a private medical college in Saudi Arabia where more than half of the poor sleepers were high achievers (60%) (Al-Khani et al., 2019). High achievers may spend the night studying until late which could contribute to poor sleep.

Conclusion

Despite the majority of UOC students having poor sleep quality, they were still able to excel in their academics. This could be due to students' personal resilience towards studying, effective coping skills, and a supportive academic environment. However, this should not be taken lightly, and targeted interventions and support services must be carried out for vulnerable groups of students to improve sleep hygiene and overall well-being.

It is important to highlight the limitations of this study. First, there was no data on the students' sleep quality before the COVID-19 pandemic. Hence, we could not directly correlate the high percentage of poor sleep quality as a result of the pandemic. Second, the sleep quality assessed was the average sleep pattern of students in the past month. Students' sleep pattern during exam week may not reflect their average sleep pattern.

Recommendations for future research include assessing students' sleep quality during examination week as this is the most stressful period for students and may change their sleeping schedules. Next, find significant causes of poor sleep among UOC students.

Conflicts of Interest

The authors declare no conflicts of interest.

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