Relationship Between Bad Habits and Insomnia among Students at University Tun Hussein Onn Malaysia (UTHM), Pagoh)

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ABSTRACT

Insomnia is the difficulty in falling asleep despite having the opportunity to sleep and it is associated with poor habits during both day and night. University students are a group that often experiences insomnia due to stress and fatigue which can negatively impact their performance. Factors influencing insomnia include bad habits such as prolonged gadget use, lack of physical activity, irregular eating and sleeping schedules, smoking, and others. Therefore, this study aims to identify the relationship between bad habits and insomnia among students at Universiti Tun Hussein Onn Malaysia (UTHM) Pagoh. A total of 300 respondents participated in this study which employed a quantitative approach and distributed online questionnaires (via Google Forms) to collect data from respondents. Data related to bad habits and insomnia were gathered for analysis to achieve the study's objectives. The findings showed that smoking, heavy meals before bedtime, excessive daytime naps, feeling overly full before sleeping, and waking up too late were significantly associated with insomnia among UTHM Pagoh students. In contrast, factors such as gadget use, lack of exercise, coffee intake, and inconsistent nighttime sleeping schedules showed no significant effect. By understanding the relationship between daily habits and insomnia along with its adverse effects students can take proactive steps to improve sleep quality for their overall well-being. The results of this study provide important implications for students' sleep management by promoting healthy daily habits to reduce the risk of insomnia. The study also recommends the inclusion of a formal conclusion with practical campus-based recommendations, as well as the addition of a limitations section. Furthermore, stratified reporting by demographic variables is encouraged to support more targeted interventions.

Keywords: Insomnia, Bad Habits, UTHM, Pagoh, Malaysia

INTRODUCTION

Habits refer to actions performed repeatedly and consistently until they become practices adopted by society (Mulyasa, 2012). Morrison (2012) explains that a habit is something done repeatedly without requiring deep thought or something that has become ingrained in a person. In short, habits are formed unconsciously because they have blended into one's being and become a routine. According to Budi Pramono (2020), habits are repetitive behaviors that form certain patterns or norms, while Putri (2023) states that habits are practices commonly performed repeatedly by certain groups. Insomnia, on the other hand is a subjective problem in which an individual feels a lack of sleep or dissatisfaction despite having sufficient opportunity to sleep (Ministry of

Health Malaysia, 2023). Generally, insomnia is a symptom of difficulty falling asleep, staying asleep or achieving good sleep quality which often affects daily activities (Roth & Roehrs, 2003). Studies have found that approximately 30% of adults in various countries experience insomnia symptoms such as difficulty initiating sleep, frequent awakenings, early awakenings or poor-quality sleep (Ancoli & Roth, 1999). Insomnia occurs more frequently among adults, women and individuals with physical or mental health problems. However, not only adults but also university students are at risk of experiencing insomnia. A study by Haile, Alemu and Habtewold (2017) found that 61.6% of 388 university students met the criteria for insomnia, indicating that three out of five students face this sleep disorder. Research by Abdalqader et al. (2018) also found that 69% of university students suffered from insomnia. This sleep disorder is closely linked to a decline in students' academic performance. Therefore, university students must pay serious attention to sleep disturbances as they may affect their future career opportunities.

In today's modern era, lifestyle changes demand that we remain highly focused and committed, sometimes even beyond our own capabilities. For instance, overworking without rest and inadequate sleep increases the risk of health problems such as insomnia. According to the Asia Pacific Journal of Public Health the rate of insomnia in Malaysia is 54%, with 12.2% experiencing chronic insomnia (Iwan Shu Aswad, 2019). Before the Covid-19 pandemic, Dr. Hazli Zakaria of Alaminda Healthcare Berhad reported that around 35% of Malaysians and 53% of their workforce slept less than seven hours per day. In addition, nine out of ten Malaysians experienced sleep problems although individuals aged 18 to 60 are advised to sleep at least seven hours daily to reduce the risk of insomnia (Bernama, 2023). Insomnia is indeed common in Malaysia, such as the case of a private worker who experienced insomnia for three consecutive nights with symptoms such as dark circles under the eyes and only being able to sleep a few hours each night (Halina Muhammad Noor, 2017). An operations manager at a bakery also had to resign due to insomnia affecting work performance often experiencing headaches and blurred vision from sleeping only after 4 or 5 a.m. since college (Bernama, 2023). Furthermore, a student at Nanyang Technological University suffered from insomnia since his first year due to academic pressure and had to seek medical help after natural remedies failed (Nur Afrina Ahmad Anis, 2018). Sleep is not merely for rest, it provides numerous benefits to the body. Poor sleep quality can lead to problems such as difficulty managing stress and making rational decisions. Severe insomnia also disrupts daily life, making it difficult for individuals to interact and focus especially among university students. If untreated, insomnia can increase the risk of stroke, seizures and hypertension. This sleep disorder may occur in the short term or persist as chronic insomnia, often caused by habits such as drinking coffee, tea or energy drinks in the evening, as well as late-night meals causing discomfort during sleep. Lifestyle also influences sleep quality and contributes to insomnia including smoking, lack of exercise, irregular sleep schedules and excessive gadget use. The "blue light" emitted by gadgets reduces melatonin production, thereby decreasing drowsiness. Based on this issue, the author aims to examine the relationship between bad habits and insomnia among students at Universiti Tun Hussein Onn Malaysia (UTHM), Pagoh.

LITERATURE REVIEW

Insomnia is a condition in which a person feels insufficient sleep or dissatisfaction despite having sufficient opportunity to rest. Insomnia not only reduces energy and emotional stability but also increases the risk of diseases such as heart problems and hypertension. From a mental health perspective, insomnia can cause depression and emotional disorders (Nur Afrina Ahmad Anis, 2018). Several subtypes of insomnia are widely recognized, namely difficulty initiating sleep (DIS), difficulty maintaining sleep (DMS) and early morning awakening (EMA) (Ohayon, 2002). External factors, such as environmental noise or transportation can affect one's sleep (Kim SJ et al., 2014). Ohayon (2002) also states that gender, age, socioeconomic status and psychiatric comorbidity are important factors in the prevalence of insomnia. In addition, short sleep duration and poor sleep quality are also major contributors. A survey across six European countries found that most individuals with insomnia experienced shortened sleep duration either voluntarily or involuntarily (Ohayon & Roth, 2001). Women are also often associated with a higher risk of insomnia. Epidemiological studies show that women are more likely to experience insomnia symptoms and report dissatisfaction with their sleep quality (Li R et al., 2002; Cao X-L et al., 2017). Lukman (2022) emphasized that humans need sufficient sleep as it is one of the most essential components of daily life. Sleep is a vital process for human beings. During sleep, recovery processes take place that restore the body from fatigue. Interrupted recovery processes can result in the body not functioning optimally, leading to decreased concentration and focus (Aziz, 2012). According to the National

Sleep Foundation (2020) on their website, the global incidence of insomnia reached approximately 67% among 1,508 people in Southeast Asia, with 7.3% of cases recorded among students. Insomnia can be categorized as a disorder in daily life, associated with negative consequences not as a natural outcome of the condition but as a psychological response. In this discussion, insomnia is not only due to lack of sleep but also other contributing factors including daily bad habits such as prolonged social media use (Thomas, 2007). The effects of these bad habits can lead to insomnia, headaches, impaired brain function, increased daytime sleepiness and loss of concentration the next day (Purnawinadi & Salii, 2020). Several previous studies have examined this issue. Narwasti Rambu (2023), in her research, showed that insomnia remains a problem among students. Students often have irregular sleep patterns with short sleep during school days and late sleep on weekends causing daytime sleepiness and insomnia. Insomnia is also a common complaint among elderly women, those with low education, low income and chronic illnesses (Gera et al., 2019). In Nengah Sumirta's (2015) study, insomnia was most prevalent among the elderly (46.7%), especially women, those with low education, the unemployed and those with habits such as drinking coffee and smoking. Furthermore, addiction to online gaming is also a cause of insomnia. Firda Intan Nursyifa (2020) stated that excessive online gaming addiction leads to sleep problems that affect players' health. This is supported by Arwansyah Kirin's (2023) study, which found that many students suffer from insomnia due to the influence of social media including online games. Staying up late at night using smartphones reduces students' sleep quality and ultimately affects their academic performance (Jaka Sarfriyanda, 2015). According to Dr. Hazli Zakaria, Founder of Alaminda Healthcare Berhad adequate sleep is important not only for rest but also for leading a healthy life and effective interaction. Quality sleep provides the energy needed to carry out daily activities (Bernama, 2023). Previous studies mainly focused on the risks and factors of insomnia, particularly among the elderly. However, studies on students' daily bad habits related to insomnia remain limited. Many studies emphasize the short-term effects of insomnia, such as academic performance and emotional state but the long-term effects of insomnia on quality of life, social relationships and productivity remain poorly understood. Therefore, the author seeks to address this gap with serious attention to help reduce cases of insomnia among students.

METHODOLOGY

This study employed a quantitative approach using *Descriptive Correlation* and *Chi-Square* analysis. This analysis identifies the presence of any relationship between two or more variables as well as the nature of the relationship, whether positive or negative particularly concerning bad habits and insomnia among UTHM Pagoh students. Quantitative research was used to measure statistical quantities involving more than 10 study samples for variable measurement in each investigated case (Norsyamimi & Mujaheed, 2019). The chosen method was a questionnaire, as it is the most practical and effective way to obtain information (Najmul Hasan & Bao Yukun, 2020). The research design employed was a survey to examine the relationship between bad habits and insomnia symptoms among UTHM Pagoh students. The sample consisted of 300 students, 105 males and 195 females. UTHM Pagoh students were selected as the sample because insomnia is prevalent among adolescents, particularly students. Students face high risks of insomnia due to assignments, electronic devices and deadlines. These factors prevent them from having sufficient sleep leading to sleep disorders such as insomnia.

The sampling method was simple random sampling, where every sample in the population had an equal chance of being selected as a respondent (Norma Jusof & Mohd Isa Hamzah, 2020). The questionnaire consisted of two sections: Part 1 and Part 2. Part 1 contained respondents' information, while Part 2 covered the relationship between students' bad habits and insomnia. The study employed a "yes" and "no" scale. Part 1 (Respondents' Demographics) involved questions about background information such as age (18 years and above), gender (male and female), ethnicity (Malay, Chinese, Indian and others such as Iban, Kadazan, Bidayuh, etc.), religion (Islam, Christianity, Buddhism, Hinduism, and others), faculty (limited to FTK, FAST, and PPD) and level of study. Part 2 (Students' Habits and Insomnia) was divided into Section A (insomnia symptoms) and Section B (students' habits related to insomnia). The questionnaires were distributed online via communication platforms, specifically WhatsApp and Telegram. These platforms were chosen because the researcher had access to several group chats with other university students. This facilitated distribution and allowed respondents to forward it to peers. Given the large population the required sample size was considerable. Therefore, data collection via online questionnaires lasted approximately four months before the survey was closed. This ensured the researcher could reach the ideal number of respondents. Upon completion of data collection, data analysis was conducted using Statistical Package for the Social Sciences version 25 (SPSS ver. 25). Analysis was carried out over about a

month based on the study's objectives. The primary objective was to identify the relationship between habits and insomnia symptoms among UTHM Pagoh students.

FINDINGS AND DISCUSSION

Respondents' Demographics

Table 1 presents the demographic information of respondents including gender, age, ethnicity, religion, faculty and level of study. From the sample, females outnumbered males, with 195 respondents (65.0%) compared to 105 males (35.0%). The largest age group was 19–23 years (n=213, 71.0%), while the smallest was 24 years and above (n=29, 9.7%). The majority of respondents were Chinese, comprising 144 students (48.0%). Only two respondents selected "others" for ethnicity, representing 0.7% of the sample. Additionally, the majority were Buddhists (115 respondents, 38.3%). The lowest was "other religions" at 0.7% (n=2). Most students in this study came from the Faculty of Applied Sciences and Technology (FAST), totaling 150 students (50.0%) while the lowest was from the Diploma Studies Centre (PPD) with 59 students (19.7%). The majority of respondents were Bachelor's degree students (210 respondents, 70.0%), while the lowest group was PhD students with only 8 respondents (2.7%). The table below provides further details.

Table 1: Respondents' Demographic Information

Students Background	Information	Frequency	Percentage (%)
Gender	Male	105	35.0
	Female	195	65.0
Age	18 and below	58	19.3
	19 – 23 years	213	71.0
	24 years and above	29	9.7
Ethnicity	Malay	106	35.3
	Chinese	144	48.0
	Indian	48	16.0
	Orhers	2	0.7
Religion	Islam	108	36.0
	Buddhism	115	38.3
	Hinduism	38	12.7
	Christianity	37	12.3
	Others	2	0.7
Level of Education	Diploma	62	20.7
	Bachelor's of Degree	210	70.0
	Master's Degree	20	6.7
	Phd	8	2.7
Faculty	Faculty of Applied Sciences & Technology	150	50.0
	Fakulty of Engineering Technology	91	30.3
	Centre of Diploma Studies	59	19.7

The Relationship Between UTHM Pagoh Students' Bad Habits and Insomnia

Insomnia Symptoms

Based on Table 2 below, the majority of UTHM Pagoh students experienced insomnia symptoms, with 213 students (71.0%), while 87 students (29.0%) did not experience insomnia.

Table 2: Insomnia Symptoms

Insomnia Symptoms	Yes		No		Total	
	N	%	N	%	N	%
Insomnia	213	71.0	87	29.0	300	100

The Relationship Between Students' Bad Habits and Insomnia

Insomnia symptoms are interrelated with students' habits, as shown in the table below:

Table 3: The Relationship Between Students' Bad Habits and Insomnia

Students' Habits		Insomnia				Total		P Value	OR
		Yes		**No**					
		N	%	N	%	N	%		
	1. Smoking habit								
Yes		110	36.7	11	3.7	121	100.0	0.00001	7.3786
No		103	34.3	76	25.3	179	100.0		
Total		213	71	87	29	300	100.0		
	2. Lack of exercise								
Yes		141	47.0	60	20.0	201	100.0	0.64360	0.8813
No		72	24.0	27	9.0	99	100.0		
Total		213	71	87	29	300	100.0		
	3. Prolonged gadget use								
Yes		174	58.0	67	22.3	241	100.0	0.35490	1.3318
No		39	13.0	20	6.7	59	100.0		
Total		213	71	87	29	300	100.0		
	4. Coffee consumption								
Yes		140	46.7	57	19.0	197	100.0	0.97220	1.0094
No		73	24.3	30	10.0	103	100.0		
Total		213	71	87	29	300	100.0		
	5. Eating heavy meals before bed								
Yes		126	42.0	29	9.7	155	100.0	0.00005	2.8966
No		87	29.0	58	19.3	145	100.0		
Total		213	71	87	29	300	100.0		
	6. Inconsistent night sleep schedule								
Yes		150	50.0	56	18.7	206	100.0	0.30494	1.3180
No		63	21.0	31	10.3	94	100.0		
Total		213	71	87	29	300	100.0		
	7. Excessive afternoon naps								
Yes		150	50.0	36	12.0	186	100.0	0.00001	3.3730
No		63	21.0	51	17.0	114	100.0		
Total		213	71	87	29	300	100.0		
	8. Overeating before bed								
Yes		143	47.7	35	11.7	178	100.0	0.00002	3.0351
No		70	23.3	52	17.3	122	100.0		
Total		213	71	87	29	300	100.0		
	9. Waking up too late								
Yes		170	56.7	57	19.0	227	100.0	0.00884	2.0808
No		43	14.3	30	10.0	73	100.0		
Total		213	71	87	29	300	100.0		

Based on Table 3, the findings show that students who had a smoking habit were 110 people (36.7%) compared to 103 people (34.3%) who did not smoke. Statistical testing showed a p-value = 0.00001 ($p < 0.05$), which proves that there is a significant relationship between smoking habits and insomnia symptoms, with an odds ratio (OR) of 7.3786. This means that the probability of students experiencing insomnia due to smoking is 7.4% compared to other causes. This finding is consistent with what was presented by Annahri Mushoffa (2013) that one of the causes of insomnia is smoking. This is reinforced by Prasadja's (2006) theory which states that smoking increases blood pressure, accelerates heart rate, and enhances brain activity making smokers have difficulty sleeping due to the stimulant effects of nicotine. Nicotine, which is present in amounts of 8–20 mg in each puff is delivered to the brain through the bloodstream, stimulating the mesolimbic system and increasing the release of the hormone dopamine. Dopamine provides sensations of pleasure, improves mood and reduces drowsiness. The increase in this hormone also enhances concentration, thinking ability and memory. However, when dopamine is excessively stimulated, it can cause tension in the sympathetic and parasympathetic nerves depending on the dosage of stimulation received. In addition, stimulants such as caffeine and amphetamines also contribute to attention disorders and anxiety which ultimately make it difficult for someone to sleep and lead to sleep deprivation (Nugraha, 2016). According to Markou (2011), smokers become dependent on nicotine which causes them to continue smoking and eventually leads to illnesses, one of which is insomnia. However, not all smokers will experience sleep disturbances or insomnia because tolerance to nicotine can vary. Individuals accustomed to high levels of nicotine may not experience significant sleep disturbances and their bodies may have adapted to nicotine's effects so that it does not directly interfere with their sleep (Nihaal Singh et al., 2023). For some individuals, smoking helps them feel calmer, reduce stress and relieve anxiety which in turn may help them sleep better. In such cases, some smokers may consider smoking as a way to achieve a relaxed state before sleep, although this effect is only temporary it can influence sleep quality in the long term (Olga Preski et al., 2022).

The findings also show that students who exercised less amounted to 141 people (47.0%), while those who were active in sports totaled 72 people (24.0%). Statistical testing showed $p = 0.64360$ ($p < 0.05$), indicating no significant relationship between exercise habits and insomnia with an OR of 0.8813, which shows that the probability of insomnia due to sports is low. Lack of exercise is one habit that can cause insomnia. Insufficient physical activity can disrupt the sleep cycle. Exercise plays an important role in reducing anxiety, balancing hormones and making the body feel tired which in turn helps achieve deeper sleep. Without sufficient physical activity the accumulated energy in the body cannot be released, eventually causing tension and difficulty relaxing at night. Research shows that individuals who do not exercise tend to experience sleep disorders and have poorer sleep quality compared to those who are active in sports (Driver & Taylor, 2000; Reid et al., 2010). Studies have shown that regular physical activity can improve sleep quality and duration (Yi Xie et al., 2021). Research has found that adults who exercise for at least 30 minutes a day can sleep 15 minutes longer than those who do not (Kelly Glazer Baron et al., 2013). Physical activity also helps reduce sleep disorders such as insomnia, daytime sleepiness and sleep apnea (Sachiko Inoue et al., 2013). In addition, moderate-intensity exercise has been proven to improve sleep quality among insomnia patients. Moderate-intensity aerobic exercise also helps increase sleep in insomnia patients (Passos et al., 2010).

The results of this study provide evidence that there is a relationship between physical activity and a person's sleep quality and disturbances. However, there are also many students who are active in sports but still experience insomnia, stress and excessive fear this may be influenced by other causes such as academic pressure, concerns about the future and busy daily schedules. These factors may be stronger causes of insomnia compared to physical activity (David A. Kalmbach et al., 2018). The quality and quantity of exercise also play an important role in its effects on sleep. Not all physical activities have the same effect on sleep. For example, light exercise may not have a significant impact on sleep compared to heavier or more intensive exercise. If the physical activity performed by students is moderate or not done consistently it may not be sufficient to provide positive effects on their sleep quality (Majid Alnawwar et al., 2023). The habit of prolonged gadget use was also observed, with 174 people (58.0%) using gadgets compared to 39 people (13.0%) who did not. The p-value = 0.35490 ($p < 0.05$) shows no significant relationship with insomnia and OR 1.3318 shows that the probability of insomnia due to prolonged gadget use is low. This is consistent with the study conducted by Sultan Qanash et al. (2021), which stated that some individuals may be more sensitive to the effects of blue light and mental stimulation, while others can easily fall asleep even after using gadgets. This view suggests that not everyone will experience insomnia just because they use gadgets, and there are also individuals who are not significantly

affected by blue light or stimulation from gadgets. Hue Thi Pham et al. (2021) further stated that gadget use at times far from bedtime for example several hours before sleep may not have the same negative effects on sleep. Therefore, as long as gadget use does not occur immediately before sleep it may not directly affect sleep quality. However, it cannot be denied that many students suffer from insomnia due to prolonged gadget use. Gadget addiction, also known as nomophobia is the main cause of excessive gadget use. Activities involving gadgets such as surfing the internet or playing video games stimulate the brain and make it difficult for individuals to relax and sleep. Gadget use increases mental and emotional stimulation, making it harder for individuals to release tension and prepare for sleep. In addition, light emitted by gadget screens inhibits the production of melatonin a hormone crucial for regulating sleep (Danang Nur Adiwibawa et al., 2023). The findings also revealed that 140 students (46.7%) had a coffee-drinking habit, compared to 73 students (24.3%) who did not. Statistical testing showed $p = 0.97220$ ($p < 0.05$), indicating no significant relationship between coffee consumption and insomnia with OR 1.0094, showing that the probability of insomnia due to coffee consumption is low. These findings show that many students who drink coffee do not experience insomnia symptoms possibly because tolerance to caffeine varies among individuals, making them less affected by insomnia (Frances O'Callaghan et al., 2018). If coffee is consumed in the morning or afternoon, caffeine may have been completely eliminated from the body before bedtime, making it less influential on sleep quality. This means that as long as students control the timing of their coffee consumption the risk of insomnia due to caffeine is low. However, in general the habit of drinking coffee can cause insomnia because coffee contains caffeine, which acts as a stimulant in the central nervous system. Caffeine blocks adenosine, a chemical that helps us feel drowsy and increases the production of adrenaline and cortisol causing increased alertness and difficulty sleeping. Studies have shown that caffeine consumption, especially in large amounts or close to bedtime can reduce total sleep time and disrupt sleep quality resulting in frequent awakenings during the night (Drake et al., 2013).

The habit of eating heavy meals before bed was high, with 126 people (42.0%) involved compared to 87 people (29.0%) who did not. Statistical testing showed $p = 0.00005$ ($p < 0.05$), which indicates a significant relationship between this habit and insomnia, with OR 2.8966, meaning the probability of insomnia due to heavy meals before bed is 2.3%. Consuming heavy meals before bed can also cause insomnia. Overeating results in discomfort and constipation which make sleeping difficult. Fatty or spicy foods require more energy to digest causing the body to remain active when it should be preparing for sleep (Suni & Debanto, 2023). However, some individuals may not experience sleep disturbances even if they eat heavy meals before bed, especially if their bodies are accustomed to the habit. For those with good digestive metabolism heavy meals may not disrupt their sleep (Rogers et al., 2023). Moreover, not all heavy meals have the same effect on sleep. For instance, protein-rich foods such as lean meat may not disrupt sleep in the same way as very spicy or fatty foods. In addition, moderate food intake may not have a significant impact on an individual's sleep. A total of 150 students (50.0%) had inconsistent night sleep schedules compared to 63 students (21.0%) who were consistent. Statistical testing showed $p = 0.30494$ ($p < 0.05$), indicating no significant relationship with insomnia and OR 1.3180 shows that the probability of insomnia due to inconsistent sleep schedules is low. This is because some individuals are accustomed to changing sleep schedules, such as those working shifts or students with busy academic schedules. These individuals may have adapted their bodies to irregular sleep patterns and do not experience sleep problems even when their schedules change. However, it is commonly known that inconsistent sleep schedules disrupt the sleep process. When sleep schedules are irregular, the body struggles to adjust to changes which can cause difficulty falling asleep. According to Rizal Fadli (2020), the body adapts to sleep cycles when consistent sleep times are maintained. The findings also show that 150 students (50.0%) took long daytime naps compared to 63 students (21.0%) who did not. Statistical testing showed $p = 0.00001$ ($p < 0.05$), indicating a significant relationship with insomnia, with OR 3.3730, showing that the probability of insomnia due to excessive daytime naps is 3.4%. Excessive daytime napping also affects the quality of nighttime sleep. Long daytime naps can interfere with daytime productivity and encourage individuals to sleep during the day. Afternoon nap times are recommended to be limited to 10 to 30 minutes (Rizal Fadli, 2020). Disturbances to the body's circadian rhythm or biological clock regulate natural sleep-wake cycles. Excessive daytime napping, especially in the evening can disrupt this rhythm and delay nighttime sleep. This results in difficulty falling asleep at night eventually leading to insomnia (Fung, C.H. et al., 2016). However, some experts argue that factors such as stress, work pressure and lifestyle have a greater impact on sleep disturbances compared to excessive daytime naps (Nesha Guruvasagam et al., 2023). For some individuals, disturbed sleep patterns are more influenced by these factors rather than long daytime naps (Xuexue Deng et al., 2020).

The habit of overeating before bed was found among 143 students (47.7%), compared to 70 students (23.3%) who did not. Statistical testing showed $p = 0.00002$ ($p < 0.05$), indicating a significant relationship with insomnia, with OR 3.0351 meaning the probability of insomnia due to overeating before sleep is 3.0%. Overeating before bed can cause discomfort when lying down, making it difficult for individuals to sleep. Many people experience heartburn and acid reflux after meals which may cause awakenings. Studies show that overeating before sleep is associated with difficulty sleeping, poor sleep quality, stomach discomfort, acid reflux and other digestive disorders (Kinsey & Ormsbee, 2015). There are also views suggesting that not all foods eaten before bed have negative effects. Healthy, low-fat snacks such as yogurt or fruit may not disrupt sleep and may even help stabilize blood sugar during sleep providing the energy needed for a better night's rest (Sora Kim et al., 2021). Finally, the findings show that 170 students (56.7%) woke up late compared to 43 students (14.3%) who woke up early. Statistical testing showed $p = 0.00884$ ($p < 0.05$), indicating a significant relationship between waking up late and insomnia, with OR 2.0808 meaning the probability of insomnia due to waking up late is 2.1%. Waking up late can also cause insomnia. Poor sleep quality resulting from late waking affects the sleep schedule. Late waking reduces exposure to daylight preventing individuals from aligning their schedules with the environment. Research shows that late waking is associated with lower sleep quality and increased sleep problems including insomnia (Lovato & Gradisar, 2014).

CONCLUSION

The study concludes that smoking, eating heavy meals before bedtime and excessive daytime napping are strongly associated with insomnia among UTHM Pagoh students, whereas factors such as gadget use and coffee consumption did not show significant effects. Therefore, students need to be aware of their daily activities and strive to eliminate unhealthy habits that may contribute to insomnia. This awareness is crucial because bad habits bring more negative effects than benefits to health and performance. Universities should also implement awareness programs on proper sleep management, provide physical activities and sports facilities to reduce stress and encourage controlled gadget use at night. In addition, consistent sleep schedules and healthy pre-sleep dietary practices should be emphasized through education and counseling sessions to help students overcome sleep problems and improve their quality of life. Overall, the findings confirm that several daily habits particularly smoking, consuming heavy or overly large meals before bedtime, excessive daytime napping and waking up too late are significantly associated with insomnia symptoms among UTHM Pagoh students. Accordingly, we recommend immediately implementable, campus-based actions: (1) health education campaigns and sleep-hygiene initiatives emphasizing appropriate dinner timing, limits on daytime naps (10–30 minutes) and consistent wake times; (2) stress and time management workshops (e.g., breathing techniques, progressive relaxation and weekly task planning) to reduce psychological triggers of insomnia; (3) smoking-cessation initiatives that integrate counselling and referral pathways to primary care and (4) collaboration with residential colleges to monitor night-time routines, provide lighter late-evening snack options and minimize environmental disturbances during sleep hours. This layered approach is expected to enhance sleep quality, student well-being and academic performance. In addition, stratified reporting by key demographics (gender, age, faculty/level of study) is encouraged to target interventions toward higher-risk groups for example, designing cessation modules for cohorts with the highest odds ratios or nutrition-literacy programs for those most affected by late-night eating habits.

Study Limitations

This study has several limitations that warrant acknowledgment. First, the sampling method and online distribution of questionnaires (via WhatsApp/Telegram groups) may have introduced selection bias, such as the overrepresentation of students who are more active in such groups, thereby limiting the generalizability of the findings to the wider population. Second, all variables were assessed through self-reported measures which are subject to recall bias and social desirability bias. Third, insomnia was measured using a dichotomous "yes/no" item, which restricts the granularity of symptom assessment future research should employ validated instruments such as the Insomnia Severity Index (ISI) or the Pittsburgh Sleep Quality Index (PSQI) to enhance reliability, sensitivity to change and cross-study comparability. Fourth, the cross-sectional design precludes causal inference and unmeasured confounders (e.g., academic stress, mental health status, or medical conditions) may have influenced the observed associations. Fifth, cultural influences and campus routines (such as late-night eating habits, academic schedules and extracurricular activities) may shape both sleep and dietary patterns, thus limiting

the transferability of these findings to other institutional contexts. Future methodological improvements should include: (i) longitudinal or intervention-based designs to evaluate changes in sleep quality following health education or stress-management programs; (ii) the use of objective sleep measures (e.g., actigraphy) to triangulate self-reported data and (iii) stratified or multilevel analyses by demographic subgroups to identify at-risk populations and support more targeted interventions.

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