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Article

Engineering Students' Lifestyle in a Malaysian Public University during the COVID-19 Pandemic

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Abstract: Unhealthy lifestyle among university students is an apparent issue in their quality of life. The criticality of this issue is supplemented by reports that students' lifestyle was severely impacted due to the pandemic and abrupt shift to online learning. This cross-sectional study aims to investigate the lifestyle of engineering students at a Malaysian public university. This paper also seeks to determine gender differences in students' lifestyles. Questionnaires were distributed to respondents via Google Forms to uncover their eating habits, physical activity, and sleeping habits. Data were collected for three months from four engineering programmes. Simple random sampling was employed, and 120 responses were obtained. The findings revealed that the students have been practising a moderately unhealthy lifestyle; possess average eating habits; are physically inactive, and do not attain sufficient sleep. This study also observed no significant differences between male and female students' eating and sleeping habits. In contrast, a significant difference was reported between male and female students' physical activities. The results also determined a moderate correlation between eating habits and sleeping habits and also between eating habits and physical activity. The findings recommend universities implement precautionary measures such as constructing relevant courses and health programmes to raise students' awareness of the importance of a holistic lifestyle.

Keywords: Lifestyle; eating habits; sleeping habits; physical activity; COVID-19 pandemic

Introduction

The period known as youth spent in higher learning institutions is a critical transition period between adolescence into adulthood (Navarro-Prado et al., 2018). This phase is viewed as the most vulnerable period for young adults as they are exposed to the freedom and responsibility of determining their own lifestyle decisions. This stage is also the period during which health behaviours are developed and solidified (Du et al., 2021). However, the COVID-19 pandemic has uprooted this period from the university, thus impacting many university students' lifestyle habits. The pandemic has resulted in the implementation of the movement control order (MCO) in Malaysia for approximately two years which severely impacted university students' lifestyle (Alghamdi, 2021) due to the change in method of learning and the inaccessibility to the facilities offered in universities such as libraries, studios, and laboratories (Dhawan, 2020). An impact of the movement control order is the lower quality of life exhibited among Malaysian university students compared to the pre-pandemic period as students' psychological and social life lessened (Cheah et al., 2021; Leong et al., 2021). Lifestyle refers to the characteristics of a population at a specific place and time. The behaviour that is done daily, such as the job, activities, fun and diet by an individual is also referred to as a lifestyle (Farhud, 2015). The lifestyle

led by an individual influences 60% of the individual's health and life quality (Lupi, 2015; Morgan & Ziglio, 2007).

University students in Malaysia were found to exhibit unhealthy lifestyles which are plausibly attributed to the students' minimal awareness of the impact of their lifestyle decisions on their health (Naggar et al., 2013). In a different study, Gadi et al. (2022) explained that more than half of participants changed their diet, exercised less, and experienced a reduction in their sleeping hours during the pandemic which has contributed to a change in appetite which portrays a link among these lifestyle aspects. These studies have lent support to the conclusion that students' lifestyle declined during the pandemic (Deasy et al., 2014; Lupi et al., 2015; Martínez-de-Quel et al., 2020). They further elaborated that the lifestyles practised among students in higher education are problematic which is attributable to the poor decisions made by the students. This issue underscores the necessity of this research, as evidence on Malaysian university students' lifestyle is inconclusive and minimal. Furthermore, the research focus of this study is engineering students as the lifestyle adopted by this particular group has been scarcely examined, as underlined by Rafique et al. (2020) and Thomée et al. (2007). Engineering students were also reported to demonstrate poor learning engagement and a lack of focus during their online classes (Asgari et al., 2021). Along with the criticality of this issue, research on the lifestyle of Malaysian university students is notably lacking in the literature which warrants this research. Therefore, this study is guided by the following research objectives:

i. To examine the eating habits, sleeping habits, and level of physical activity of engineering students in a public university in Malaysia.
ii. To determine if there is a significant mean difference in the eating habits, sleeping habits, and level of physical activity scores between male and female engineering students in a public university in Malaysia.

Literature Review

This study focuses on three lifestyle aspects since the current literature has reported contributors toward students' unbalanced lifestyle were poor eating habits (Tanton et al., 2015), low physical activity (Greene et al., 2011), and lack of sleep (Adriansen et al., 2017). Eating habits refer to the response to social and cultural influences that result in conscious, collective, and repetitive behaviours that lead people to decide, consume, and use certain foods and practice a certain diet (Rivera Medina et al., 2020). A common impact of poor eating habits is the lack of sleep due to the positive relationship between the two variables as investigated by Du et al. (2021) who concluded that students who demonstrated declined sleep quality possess higher dietary risk scores which is a concerning issue. Previous studies such as Castelao-Naval et al. (2019) have also examined the connection between poor-quality sleep and type of food such as the consumption of caffeinated beverages and high-fat food. Studies have also shown a clear difference in eating habits between male and female students whereby the most apparent difference is protein intake (Castelao-Naval et al., 2019; Horgan et al., 2019).

The second lifestyle aspect is physical activity which is defined as the bodily movements by the skeletal muscles that result in the usage of energy (Caspersen et al., 1985). Despite the significance of exercise in increasing the fitness of physical and mental health, studies such as Bertrand et al. (2021) and Rivera et al. (2021) indicated a decline in physical activity and an increase in the sedentary lifestyle among university students, especially during the pandemic. Despite knowing the importance of attaining adequate sleep, most university students are notorious for their erratic sleep schedule, which leads to their inadequate amount of sleep (Castelao-Naval et al., 2019). Huang et al. (2014) discovered that the reasons for students struggling with daytime sleepiness are a result of sleep disturbance, poor sleep quality, and consumption of unhealthy snacks before sleeping. The importance of adopting good sleep hygiene to facilitate students in obtaining high-quality sleep such as not participating in mind-arousing activities and consuming sugary or alcohol before sleeping was depicted in Thomée et al. (2007) and Todd and Mullan (2013). A high correlation between the reduction in physical activity and the quality of sleep was also observed by Brand et al. (2010). Participants with high perceived physical activity showed lower insomnia scores and were less inclined to ruminate about unresolved problems. Almutairi et al. (2018) and Rajappan et al. (2015) highlighted that a gap between

engagement in physical activity based on gender exists; the males were found to be more active compared to females as both had different motivations when engaging in physical activity.

Unhealthy lifestyles such as reduced physical activity, decreased hours of rest, and poor diet, which have become a norm for university students, have been linked to various illnesses. Students are also noted to have spent more time doing study-related sedentary activities such as sitting in class, studying, and conducting computer-related activities for academic purposes, which worsens their lifestyle habits. Although the effects of health risk factors among students can be avoided by identifying and changing behaviour at the early stage, many students find such change to be challenging as the habit is incorporated into their lifestyle. The unhealthy lifestyle adopted today has contributed to the rapid rise of diseases, such as cardiovascular diseases, diabetes, and obesity, hence the rising number of deaths. Such underlines the criticality of the current study to investigate university students' lifestyles because their habits during these years will shape and impact their quality of life later on.

Methodology

1. Research Design and Sample

This study employed a cross-sectional design to fulfil the stipulated research objectives. Engineering students were selected as the target population of this study as the lifestyle adopted by engineering students has not been extensively studied due to the skewed focus on health science students such as medical students (see for instance Rafique et al., 2020; Thomée et al., 2007) and nursing students such as Gallego-Gómez et al. (2020) and Heidari (2017). This inference is complemented by Asgari et al. (2021) as they highlighted that there is a shallow literature that examined the challenges experienced by engineering university students amidst the pandemic. Thus, the findings of this study would shed light on the lifestyle practised by engineering students during the pandemic as engineering courses are recognised as one of the most challenging courses internationally as it is conventionally content-centered and action-oriented. Therefore, engineering students were more affected by the transition towards online learning as they were unable to conduct experiments or technical tasks.

2. Research Instrument

This study utilised a closed-ended structured questionnaire that consisted of four sections (A, B C and D) with a total of 16 items. A questionnaire was selected as the research strategy since surveys efficiently provide a huge amount of data in a short period of time (Jones et al., 2013). A 10-point interval scale was utilised in the questionnaire to ensure that the data were more independent and provided a higher degree of freedom whereby the scale applied ranged from 1 (strongly disagree) to 10 (strongly agree) (Rothman et al., 2007). A brief explanation of the study's objectives and assurance of confidentiality was also provided on the first page of the questionnaire. Section A explored the demographic profile of the respondents which included gender, types of engineering courses and their current semester. Section B consisted of five items related to eating habits which were obtained from the Dietary Habits and Nutrition Beliefs Questionnaire by Jeżewska-Zychowicz et al. (2018). The original monthly measurement scales used for Section B might be a difficult range to use as it requires respondents to recall their eating habits in a month. Therefore, in this survey, a weekly measurement was used in Section B to assist the respondents in providing more honest responses. Section C's items were adapted from the College Lifestyle and Attitudinal National (CLAN) Survey by Hope et al. (2004) to gauge the respondents' physical activity level. Section D consisted of five items regarding sleeping habits and they were adapted from Adriansen et al. (2017) to determine the sleeping habits and their perception of its effects.

3. Sampling and Data Collection Procedures

The questionnaire was piloted to a group of 30 engineering students to ensure that the items in the questionnaire were not negatively worded and did not contain ambiguity. Minor amendments were made to one item in Section B (eating habits) and two items in Section C (physical activity) to improve clarity and two

spelling mistakes were corrected. A list of the engineering classes was obtained from the faculty whereby stratified random sampling was employed in the selection of classes from each engineering programme. Subsequently, a simple random sampling technique was utilised in the selection of respondents using the RAND function in Microsoft Excel. The questionnaires were distributed to 200 engineering students (10 classes) from four different engineering programmes (civil, chemical, electrical and mechanical engineering) in a public university in Selangor, Malaysia. A link to the online questionnaire in Google Forms was emailed to the selected students. Follow-up emails were also initiated to increase the response rate. The data collection was conducted between December 2020 to February 2021 for approximately three months. This study obtained a total of 122 returned responses, which accounted for a response rate of 81%. Table 1 presents the demographic profile of the respondents in this study. The results in Table 1 demonstrate that the respondents were predominantly from the chemical engineering course (68.3%) while more than half of the respondents were Year 2 undergraduates (57.5%).

Table 1. Demographic profile of respondents

Demographic Characteristics	**Categories**	**Frequency (n)**	**Percentage (%)**
Gender	Male	63	52.5
	Female	57	47.5
Year of Study	Year 1	3	2.5
	Year 2	69	57.5
	Year 3	40	33.4
	Year 4	8	6.7
Engineering Course	Civil	19	15.8
	Chemical	82	68.3
	Electrical	5	4.2
	Mechanical	14	11.7

3. Data Analysis Procedures

The collected data were checked for any blanks and outliers in Microsoft Excel. No blanks were detected but two outliers were deleted from the data. Therefore, the final number of responses in this study was 120. Next, each response was allocated a specific ID and was transferred to SPSS. The data underwent reliability analysis in SPSS and were then subjected to descriptive analysis to answer the first research objective which aims to identify engineering students' eating habits, physical activity and sleeping habits. Prior to the t-test, the scores for each variable (eating habits; sleeping habits; physical activity) were computed. Following the summation, an independent sample t-test was conducted to fulfil the second research objective which was to determine if there is a significant mean difference between male and female engineering students' eating habits, physical activity and sleeping habits. Finally, Pearson product-moment correlation was conducted to determine the correlation among eating habits, sleeping habits, and physical activity.

The Findings

1. Descriptive Analysis of Eating Habits, Sleeping Habits and Physical Activity

The first research objective seeks to investigate engineering students' eating habits during the COVID-19 pandemic. Five items were incorporated to measure the students' eating habits during the pandemic. Reliability analysis of the scale resulted in a Cronbach's alpha value of 0.603, which exceeds the minimum acceptable value of 0.60 (Pallant, 2018). Table 2 demonstrates that the item *I always eat at regular times in a week* received the highest agreement (M=6.46, SD=2.57) while the item *I always consume red meat in a week* attained the lowest agreement from the respondents (M=3.95, SD=2.13). This finding indicates that most of the students eat at regular times in a week, and a few reported consuming meat less weekly. This finding contradicts Lupi et al. (2015), who concluded that the food consumed most was meat (5.73 servings per week).

However, the finding of the current study corroborates Davitt et al. (2021) who clarified that about 30 percent of university students were attempting to consume less red meat by opting for plant-based alternatives that are beneficial for the environment. Another 20 percent to 25 percent of the respondents articulated reasons such as health, animal welfare, and cost (Davitt et al., 2021). The students acknowledged that they view red meat as an expensive food item which is a determining factor in eating habits practised by them (Al-Aklabi et al., 2016).

Table 2. Descriptive analysis of eating habits

	Item	**Mean**	**Standard Deviation**
EH1	I always eat at regular times in a week.	6.46	2.57
EH2	I always consume fruits and vegetables in a week.	5.67	2.46
EH3	I always drink sugary beverages in a week.	4.73	2.62
EH4	I always consume fast and/or instant food in a week.	4.53	2.49
EH5	I always consume red meat in a week.	3.95	2.13

The second part of the first research objective seeks to analyse engineering students' sleeping habits during the Covid-19 pandemic. A total of five items were adapted to measure the students' sleeping habits during the pandemic. A reliability analysis conducted on this scale rendered a Cronbach's alpha value of 0.651, which exceeded the minimum acceptable value of 0.60 (Pallant, 2018). Table 3 shows that the item *I use an electronic device when lying in bed to go to sleep* obtained the highest mean (M=8.04, SD=2.50) while the lowest mean was attained by the item, *I have to take medications to go to sleep* (M=1.97, SD=2.02). The item *I always sleep at inconsistent time* received significant (M=7.43, SD=2.75) and *I always feel that my quality of sleep is unsatisfactory* (M=6.19, SD=3.08) also received significant agreement from the respondents. The results of the study are aligned with Rafique et al. (2020) who found that 88.7 percent of their respondents used mobile phones for at least 30 minutes after the lights were turned off for sleeping. The result is further strengthened by Thomée et al. (2007) who explained that the use of mobile phones at bedtime exposes the brain to stimulating contents and will result in mobile phone overuse and phone addiction, which contribute to poor sleep quality and consequently daytime sleepiness. The findings of these studies suggest a link between the items *I use an electronic device when lying in bed to go to sleep* (SH2) and *I feel that the quality of my sleep is unsatisfactory* (SH5).

Table 3. Descriptive analysis of sleeping habits

	Item	**Mean**	**Standard Deviation**
SH2	I always use electronic devices right before going to bed	8.04	2.50
SH1	I always sleep at inconsistent time.	7.43	2.75
SH5	I always feel that my quality of sleep is unsatisfactory.	6.19	3.08
SH3	I always experience trouble going back to sleep.	4.88	3.02
SH4	I always consume medication to go to sleep.	1.97	2.02

The third part of the first research objective seeks to determine the level of physical activity among engineering students during the COVID-19 pandemic. Three items were incorporated to measure the students' level of physical activity during the pandemic. A reliability assessment was performed on this scale and rendered a Cronbach's alpha value of 0.865. This value ascertains that the scale is reliable as it surpassed the threshold value of 0.60 (Pallant, 2018). As indicated in Table 4, the item *I engage in at least 20 minutes of moderate exercise at least 3 times a week* achieved the highest mean (M=4.42, SD=3.03). In contrast, the item *I engage in 20 minutes of high-intensity exercise at least 3 times per week* achieved the lowest agreement (M=4.06, SD=2.92). This implies that the students participate less in 20 minutes of high-intensity activities, such as sprinting and boxing, which can cause a large increase in breathing or heart rate. Rajappan et al. (2015) note that excessive workload and lack of free time for students to participate in any form of activity available

at the universities are the factors contributing to their poor physical activity. Correspondingly, Bray and Born (2004) explain that the transition from high school to university life may influence students' physical activity as they are exposed to a combination of several factors, such as (i) academic, physical, emotional, and social changes, and (ii) changes in independence and living situations.

Table 4. Descriptive analysis of physical activity

	Item	**Mean**	**Standard Deviation**
PA2	I engage in at least 20 minutes of moderate-intensity exercise at least 3 times per week.	4.42	3.03
PA3	I engage in at least 20 minutes of low-intensity exercise at least 3 times per week.	4.32	2.90
PA1	I engage in at least 20 minutes of high-intensity exercise at least 3 times per week.	4.06	2.92

2. Independent Samples t-test Analysis of Eating Habits, Sleeping Habits, and Physical Activity

The second research objective intends to determine whether there is a significant mean difference in eating habits, physical activity, and sleeping habits between male and female engineering students in Malaysia. Therefore, an independent sample t-test was carried out to compare the mean scores of males and females. Subsequently, the benchmarks by Cohen (1988) in interpreting effect size were used as small (d=0.2), medium (d=0.5), and large (d=0.8). Results for both the independent samples t-test and Cohen's effect size are presented in Table 5.

The results in Table 5 report that no significant difference was observed, $t(120)=1.15$, $p>0.05$, in the eating habits scores for males (M=26.12, SD=6.65) and females (M=24.63, SD=7.44). Further analysis revealed that the magnitude of the difference in the means was very small (eta squared = 0.21) This result contradicts Alkazemi (2018), Castelao-Naval et al. (2019), and Lombardo et al. (2019) who proved that male and female possess different eating habits. Their studies portrayed a consensus in which women prefer to consume salty food and sugary beverages while men prefer to consume protein-packed meals.

Table 5. Independent samples t-test analysis

		Levene's test for Equality of Variances		**t-test for Equality of Means**		**Effect size**
		F	**Sig.**	**t**	**Sig (2-tailed)**	**Cohen's d**
Eating Habits	Equal variances assumed	0.18	0.68	1.15	0.25	0.21
	Equal variances not assumed			1.16	0.25	
Sleeping Habits	Equal variances assumed	0.03	0.86	-1.21	0.23	-0.22
	Equal variances not assumed			-1.21	116.71	
Physical Activity	Equal variances assumed	2.18	0.14	3.91	0.00	0.72
	Equal variances not assumed			3.87	0.00	

Table 5 underlines that there is no significant difference in sleeping habits between males (M=27.49, SD=8.82) and females (M=29.44, SD=8.78) as $t(120)=-1.21$, $p>0.05$. However, a more detailed look into the results highlighted a very small magnitude in the mean difference (eta squared=0.22). Prior research has provided mixed results in confirming whether gender influences students' sleeping habits. Studies such as Vallat et al. (2018) have advocated that gender affects sleeping habits yet scholars such as Marta et al. (2020) reported contradictory findings.

Table 5 also showed a notable finding that there is a significant mean difference in physical activity scores between males (M=15.58, SD=8.17) and females (M=10.27, SD=6.68), $t(120)=3.91$, $p<0.01$. Next, the effect size was determined and reported to be 0.72 as shown in Table 5. Therefore, the effect size is deduced as quite large based on the benchmarks listed by Cohen (1988). This result is in alignment with evidence from the current body of literature which infers there is an apparent gap in physical activity engagement whereby males are more active compared to females (Almutairi et al., 2018; Clemente et al., 2016; Rajappan et al., 2015).

3. Correlation Analysis among Eating Habits, Sleeping Habits and Physical Activity

The third research objective intends to determine how eating habits, physical activity, and sleeping habits in this study correlate. Three hypotheses were formulated to fulfil this research objective as listed in Table 6. Correlation analysis using Pearson product moment correlation coefficient (r) was conducted to describe the strength and direction of the correlations among these three variables. The correlation between eating habits and sleeping habits (Hypothesis 1) demonstrated that there is a moderate positive correlation ($r=0.32$, $p<0.001$). Next, the correlation between eating habits and physical activity (Hypothesis 2) was assessed. Table 6 reported that there is a moderate positive correlation between eating habits and physical activity ($r=0.36$, $p<0.001$). Thus, positive eating habits are correlated with higher levels of physical activity. The correlation between sleeping habits and physical activity (Hypothesis 3) was also determined and the results in Table 6 underlined that although these two variables have very weak correlation ($r=0.05$), the correlation is deemed not significant ($p>0.05$).

Table 6. Pearson Correlation Coefficient Results

	Constructs	**Pearson correlation coefficient (r)**	**Sig (p)**
H1	There is a correlation between eating habits and sleeping habits.	0.320	0.000
H2	There is a correlation between eating habits and physical activity.	0.360	0.000
H3	There is a correlation between sleeping habits and physical activity.	0.050	0.560

Therefore, this study deduces that positive eating habits will contribute to better sleeping habits. This positive correlation is in alignment with observations made by Adriansen et al. (2017) and Du et al. (2021). The results (Hypothesis 2) also highlight that as eating habits improve, students are most likely to participate in physical activity. In contrast, the non-significance of Hypothesis 3 was reported which was is in agreement with Yousif et al. (2019) yet opposes the results by Brand et al. (2010) and Rajappan et al. (2015).

Discussion

The central objective of this study is to investigate the lifestyle of engineering students at a public university in Malaysia. The following three lifestyle facets were explored: (1) eating habits, (2) sleeping habits, and (3) physical activity. With regards to the students' eating habits (first research objective), they were found to have a moderate awareness of the importance of healthy eating habits. This study identified that engineering students prefer to opt for meat alternatives. Such a habit can be attributed to their financial concerns hence the pattern of consuming cheap and low-nutrient food (Davitt et al., 2021). However, it is crucial for university students to consume a well-balanced diet to ensure optimum learning performance as continuous consumption of low-nutrient food might result in poorer cognitive function (Wright et al., 2017). In terms of sleeping habits, respondents of this study were found to have acceptable sleeping habits during their university years. A further look into the results revealed that MCO has significantly increased students' screen time thus affecting engineering students' sleeping patterns and shortening their sleeping period (Ranjbar et al., 2021). Okano et al. (2019) and Zeek et al. (2015) stress that a longer duration of sleep at night contributes to higher course

grades and grade point averages (GPAs) and prevents students from experiencing daytime sleepiness during class. The third lifestyle aspect examined was physical activity. Although it is an important factor, the respondents were shown to be less engaged in all levels of physical activity. Deliens et al. (2015) attributed university students' physical activity and sedentary behaviour to matters such as examinations, the type of residency and academic workload. This is concerning as Hou et al. (2020) and Lipošek et al. (2019) reported that there is a positive relationship between an active physical lifestyle and students' academic success. Cahuas et al. (2019) also emphasised that students who practised higher levels of physical activity have a lower probability of falling into depression which emphasises the essentiality of encouraging students to incorporate physical activity into their lifestyle.

The second objective of this study is to determine if there is a significant mean difference in male and female engineering students' eating habits, physical activity, and sleeping habits. This study concluded that there was no significant difference between male and female engineering students' eating habits and sleeping habits. However, there was a significant difference between male and female engineering students' physical activity and a large effect size was reported. This aligns with reports in the literature (Lipošek et al., 2019; Rajappan et al., 2015) that male students have a higher participation rate in physical exercises (mild, moderate, and high intensity). A possible reason for the difference in the extent of physical participation is due to the insufficient facilities or controlled access that are specifically catered for women. As Malaysia is a nation that has a high Muslim population, female Muslims demonstrated lower intention for physical activities as they are cautious about their dress code such as not wearing tight or skin-revealing clothes (Aljayyousi et al., 2019; Nakamura, 2002; Rajappan et al., 2015). Another plausible reason for the difference in the level of physical activity was that females prefer to participate in physical activity at a more advanced age (40-64 years old) for health and appearance purposes. This underlines the importance of facilitating a higher participation in physical activity among female students.

The third objective tests three hypotheses. The first hypothesis assesses if there is a correlation between eating habits and sleeping habits (Hypothesis 1) and concludes that there is a medium positive correlation between these two variables. Declined sleep quality will contribute to higher dietary issues and as they highlighted food such as high-fat food can contribute to mental fog and shorter REM sleep. This positive correlation is in alignment with observations made by Adriansen et al. (2017) and Du et al. (2021). The second hypothesis determines if there is a correlation between eating habits and physical activity. The results of Hypothesis 2 demonstrated that there is a medium positive correlation between eating habits and physical activity. The correlation between sleeping habits and physical activity (Hypothesis 3) was also determined and despite these two variables having minimal correlation ($r=0.05$), the correlation is deemed not significant ($p>0.001$). The non-significance of Hypothesis 3 is in agreement with Yousif et al. (2019), however, it is essential to note that good sleeping habits will lead to a more satisfying experience when participating in physical activity and the students will experience less sleep disturbances and increased concentration (Brand et al., 2010).

Conclusion

In conclusion, the findings revealed that the engineering students have been practising a moderately unhealthy lifestyle; they practise average eating habits, are less engaged in all levels of physical activity, and exhibited poor sleep. This is worrying as students are considered an important asset for higher learning institutions. Not only will these factors affect their learning satisfaction, but also negatively impact students' academic performance. Prompt and suitable solutions need to be conceptualised and implemented to ensure that students' eating habits, physical activity and sleeping habits are well-managed. From the view of the findings, this study intends to make some recommendations which, if taken into consideration, may contribute to some positive changes to the current findings. Future studies are recommended to look into the influence of students' lifestyle on the academic performance by measuring their CGPA. This study also suggests that future scholars to expand the scope of population to different programme clusters such as social sciences and health sciences. Another interesting perspective would be carrying out a detailed comparison between students from both public and private universities as the learning environment, health culture, and facilities provided may differ.

Another interesting gap that warrants further look into is investigating the motivating factors that contribute to the different intentions in influencing male and female engineering students' physical activity levels.

This study, therefore, suggests several strategies that may contribute to positive changes among university students. University authorities should develop and encourage students to register for elective classes that educate on the basics of maintaining a healthy lifestyle for all university students. Implementing such classes can be a way of developing a sense of realisation about the importance of maintaining good health and well-balanced lifestyle as a university student. Students can be made more aware of maintaining a proper healthy lifestyle on campus. The second recommendation is for faculty departments to conduct annual assessments (online or physical) of students' lifestyle such as monthly check-ins to evaluate and better students' lifestyle habits. The findings also suggest that constant assessments of student lifestyle could facilitate a deeper understanding of their lifestyle. The third recommendation is for cafeterias to offer a wider variety of healthy meal options. It is requisite that cafeterias provide healthier food options to motivate students to make healthier food choices and establish healthy eating habits. Most university cafeterias serve a variety of unhealthy meals, which could have influenced the students' eating behaviour. This suggestion is pertinent as students' traffic that has been moving back to their respective universities is increasing as the pandemic regulations have loosened. The final recommendation is for university authorities to take measured steps in upgrading the health and fitness facilities within the campus. Well-developed and modern installation of health and fitness facilities is essential for tertiary education students because such amenities would maintain students' level of health, fitness, and physical activities. By implementing the proposed measures, the university students' lifestyle practices can be enhanced, a meaningful learning experience is created, and more well-rounded students are moulded.

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