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The Association Between Certain Lifestyle and cGPA of Students from University of Cyberjaya

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Abstract

Introduction: Lifestyle factors are pivotal in shaping academic outcomes among university students. This study examines the relationship between various lifestyle factors—such as physical activity, sleep quality, and dietary habits—and cumulative grade point average (cGPA), alongside socio-demographic influences. Objective: This study aims to explore the multifaceted relationships between lifestyle factors and cGPA among students at the University of Cyberjaya, focusing on the impact of physical activity, sleep quality, breakfast habits, and socio-demographic variables such as gender, age, and race on academic performance. Methodology: Employing a cross-sectional design, involving 394 University of Cyberjaya students aged 18-30, convenience sampling was used. Physical activity was assessed using the International Physical Activity Questionnaire, breakfast habits were classified based on food group combinations, and sleep quality was evaluated via the Pittsburgh Sleep Quality Index. Data analysis was conducted using chi-square tests and logistic regression in JASP software. Results: The analysis highlighted significant associations: younger students (18-19) demonstrated higher academic performance; male students outperformed females; and active students had higher cGPA scores. Furthermore, students who do not skip breakfast and those with better sleep quality exhibited stronger academic performances. Conclusion: The study's findings suggest that maintaining a healthy lifestyle, including regular physical activity, adequate sleep, and a nutritious breakfast, significantly correlates with higher academic achievement.

Keywords: Lifestyle factors, academic performance, university students, physical activity, sleep quality, dietary habits, cGPA

Introduction

Universities play a pivotal role in shaping graduates who are equipped with the essential skills—both technical and interpersonal—to thrive in the workforce or embark on entrepreneurial ventures. A key metric of student success and preparedness is academic performance, typically assessed through the cumulative grade point average (CGPA) (1). Understanding the myriad factors that influence CGPA is crucial for developing effective educational strategies and interventions.

A substantial body of research has explored various determinants of academic success. For example, research on study habits has shown varied outcomes. A study at Maastricht University in the Netherlands found that while learning strategies were beneficial, habitual study behaviours and other external factors played a critical role in

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influencing academic performance, sometimes resulting in inconsistent correlations between study habits and academic outcomes (2).Similarly, a study on academic performance at a public university in Malaysia found no significant correlation between study hours, stress levels, or learning strategies and students' overall CGPAs. However, gender differences were observed, with male students showing a slightly higher average GPA compared to their female counterparts (3).

Further research conducted at UniversitiKebangsaan Malaysia highlighted that an Integrated Cumulative Grade Point Average (CGPA) system, which considers multiple aspects of student performance beyond academics, showed that initial CGPA alone did not reliably predict final academic success, as some students demonstrated significant improvements over time (4). At the University of Malaya, a study in the Asian Journal of Business and Accounting revealed that CGPA variations were not solely attributed to prior knowledge in subjects like Mathematics and Accounting. Instead, factors such as gender, admission qualifications, entry CGPA, participation in specific programs, and student cohorts played a more significant role in influencing academic performance (5).At Universiti Malaysia Pahang, the impact of diverse educational backgrounds and institutional transfers were identified as contributing factors to variations in CGPA. The study highlighted that students transferring between institutions often faced unique academic challenges, which influenced their performance differently compared to students who remained in a single institution throughout their studies (6).

Despite the extensive research on these traditional factors, there is a growing interest in how lifestyle choices impact academic performance. This study shifts focus to three lifestyle factors: sleep quality, breakfast quality, and physical activity, and their effects on CGPA.Sleep is fundamental to both physiological and mental well-being, and its relationship with academic performance has been extensively documented(7). Demonstrated that students with poor sleep quality tend to perform worse academically, while regular sleep-wake patterns are associated with higher CGPAs. Similarly, a systematic review in Sleep and Biological Rhythms found that students with reduced sleep duration showed poorer cognitive performance and academic outcomes. Short sleep was associated with lower attention and increased daytime sleepiness, which in turn impaired classroom engagement and academic focus (8).

Breakfast consumption has also been investigated for its potential effects on academic performance, with mixed findings. A systematic review highlighted a correlation between increased breakfast energy intake and improved performance, though the evidence was not conclusive(9). Despite this, breakfast is widely promoted for academic success, as seen in marketing claims for products like cereals and Milo in Malaysia. A recent study on university students in Malaysia indicated that regular breakfast consumption was positively correlated with improved academic performance. The study controlled for variables such as socioeconomic status, nutritional intake, and study habits, concluding that breakfast played a key role in maintaining cognitive function and concentration throughout the day (1).

Physical activity is another lifestyle factor with implications for academic success. In Malaysia, government schools incorporate physical education into the curriculum to promote overall well-being. The World Health Organization emphasizes that physical activity offers numerous benefits, including improvements in cognitive, motor, and social skills, as well as positive impacts on metabolic health and musculoskeletal development. These benefits are crucial for enhancing overall well-being and academic performance in children and adolescents (10). Research conducted at a Malaysian university found that students with access to fitness and recreational facilities showed higher levels of academic engagement and

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improved GPA scores compared to their peers without such access. This suggests that physical activity opportunities can enhance academic outcomes, likely due to improved mental health and stress management (1).Research conducted by WHO which included data obtained from Malaysian universities highlighted that students who regularly participated in physical activities through university recreation facilities showed higher academic engagement and GPA scores. These students also exhibited improved cognitive performance, including better concentration and memory retention, compared to their less active peers, suggesting that structured exercise may significantly enhance academic performance through better mental health and stress management (11).

This study aims to contribute to the understanding of how these lifestyle factors—sleep quality, breakfast quality, and physical activity—affect academic performance, with a focus on their impact on CGPA. By investigating these aspects, the study seeks to provide valuable insights for educators and institutions to enhance student success and well-being.

Methods

Design and Procedure

This correlation study was conducted from the 28th June 2023 until 28th June 2024. Data was collected via a remote data collection (RDC) method (12). Validated interviewer-administered questionnaires were used to collect data via a 10-minute telephone survey. The telephone survey only allowed one response per email address. The questionnaire was piloted on a sample of 15 students to test the validity as well as the reliability of the questionnaire which were not included in the final analysis of this study. Data encryption was done to protect the confidentiality of data.

Population and Sampling

This study focuses on the student body of the University of Cyberjaya, targeting individuals aged 18-30 years enrolled in foundation, diploma, bachelor's degree and master's degree programs. Both male and female students proficient in either Bahasa Malaysia or English are included, while those unwilling to participate are excluded. The sampling method adopted is convenience sampling. The target population encompassed students from diverse disciplines within the University of Cyberjaya. The sampling frame is sourced from the student affairs department.

Sample size

The sample size is computed to be 361 students. Accounting for a 10% non-response rate, the total sample size is increased to 394 students. The interval for sampling is determined using the formula: Total number of units in the sample frame / sample size = K. Data collection is conducted randomly but adheres to the predetermined interval, ensuring a representative sample from the University of Cyberjaya's student population.

Study variables and Instruments

The dependent variables of this study include exercise, eating breakfast, and sleep quality. Physical activity status is measured using the International Physical Activity Questionnaire (IPAQ) scoring (14), with results recorded in categories of the level of physical activity (active or inactive) and as a continuous variable (MET minutes in week). To further categorize physical activity levels, an easy-to-use spreadsheet for automatic scoring of the IPAQ is employed. For eating breakfast, each breakfast entry from participants is characterized qualitatively using five different labels based on combinations of food groups present in the breakfast. These labels are recorded into specific 'individual breakfast scores' with scores ranging from 1 to 5, where scores 1-3 indicate bad breakfast habits and scores 4-5 indicate good breakfast habit (15). The individual breakfast scores are detailed as follows: Score 1 represents subjects who do not eat breakfast today and do not usually eat

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breakfast; Score 2 includes subjects who eat breakfast today but usually do not; Score 3 applies to subjects who eat/do not eat breakfast today but usually have a breakfast with Individual Breakfast Label 1 or 2; Score 4 pertains to subjects who do not eat breakfast today but usually have a breakfast with Individual Breakfast Label 3, 4, or 5; and Score 5 is for subjects who eat breakfast today and usually have breakfast with Individual Breakfast Label 3, 4, or 5. Sleep quality is measured using the Pittsburgh Sleep Quality Index (PSQI) (16), which consists of 19 questions across seven components: sleep quality, sleep onset latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction. Each component is scored on a scale of 0 to 3, with the global PSQI score ranging from 0 to 21. A global PSQI score over 5 indicates poor sleep, with higher scores representing poorer sleep quality. The independent variables include sociodemographic factors such as gender, age, race, and discipline. Gender is categorized as either male or female, and age is divided into two groups: 18-25 years old and 26-30 years old. Race is classified into Malay, Chinese, Indian, and others, while discipline covers all fields of study at the University of Cyberjaya.Data collection involves the use of a self-administered questionnaire via Microsoft Forms, distributed to all students at the University of Cyberjaya. Assistance is provided to participants who require help in filling out the questionnaire. Anonymity is maintained, and no personal data is gathered. Confidential information, such as CGPA results, is self-reported by participants and remains anonymous. The study data, accessible only to researchers, will be deleted after five years.

Results

Demographic and Socioeconomic Profile

A total of 394 students have participated in the survey, which has surpassed our target of 384 students. Characteristics of the study sample (n=394) are shown as below in (Table 1). The majority of students fall within the age range of 18-25 years, comprising 82.5% (n=325) of the sample.Only 17.5% (n=69) of students are in the 26-30 years age range, indicating a younger student population.The sample has a slightly higher percentage of female students at 53% (n=210) compared to male students at 46.7% (n=184).This suggests a fairly balanced gender representation with a minor predominance of females.Malay students represent the largest ethnic group in the sample at 38.3% (n=151).Chinese students make up 34.8% (n=137), followed by Indian students at 25.6% (n=101).Other ethnicities comprise only 1.3% (n=5), indicating a small representation of minority groups.The ethnic distribution reflects the demographic diversity typical within Malaysian universities, with a dominant representation of Malay, Chinese, and Indian groups.A vast majority of the students are Malaysian, with 98.2% (n=387), while non-Malaysians constitute only 1.8% (n=7).

This shows that the sample is predominantly local, with very few international students, which may influence the generalizability of findings to non-Malaysian contexts.The distribution across years shows that the largest groups are in Year 3 (36.8%, n=145) and Year 2 (34.3%, n=135).Year 4 students represent 24.6% (n=97), while Year 1 has a smaller proportion at 3.6% (n=14).Year 5 students make up only 0.8% (n=3) of the sample, indicating that most participants are in their middle years of study.This distribution reflects a higher proportion of students in the middle of their academic journey, with fewer in the initial and final years.

Table 2 shows that the chi-square test reveals a significant association between age and CGPA (χ2=240.11, P<0.001). Among students aged 18-25 years, 53.2% (n=173) were high-achievers (CGPA ≥ 3.0), while 46.8% (n=152) fell into the low/moderate-achieving category (CGPA < 3.0). In contrast, among students aged 26-30,

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Table 1: Socio-demographics variables distribution for all included variables

Variables	n	%
Age		
18-25 years	325	82.5
26-30 years	69	17.5
Gender		
Male	184	46.7
Female	210	53
Ethnicity		
Malay	151	38.3
Chinese	137	34.8
Indian	101	25.6
Others	5	1.3
Nationality		
Malaysian	387	98.2
Non-Malaysian	7	1.8
Current year of studies		
Year 1	14	3.6
Year 2	135	34.3
Year 3	145	36.8
Year 4	97	24.6
Year 5	3	0.8

95.7% (n=66) were high-achievers, while only 4.3% (n=3) were low/moderate-achievers. This significant association suggests that students in the older age group (26-30 years) are more likely to achieve higher CGPAs, possibly indicating that maturity or life experience could positively impact academic performance.

There is a strong association between gender and CGPA ($\chi 2=264.07$, $P<0.001$). Among male students, 98.1% (n=206) were high-achievers, while only 1.9% (n=4) were in the low/moderate-achieving group. In contrast, 17.9% (n=33) of female students were high-achievers, while a larger proportion, 82.1% (n=151), were low/moderate-achievers. This result implies that male students tend to have higher academic achievements than female students within this sample, which could be attributed to a variety of academic or social factors that warrant further exploration.

Ethnicity was significantly associated with CGPA ($\chi 2=37.51$, $P<0.001$). Among Malay students, 46.4% (n=70) were high-achievers, whereas 53.6% (n=81) were in the low/moderate-achieving category. For Indian students, 14.9% (n=15) were high-achievers, while 85.1% (n=86) were low/moderate-achievers. Chinese students had a relatively balanced distribution, with 50.4% (n=69) high-achievers and 49.6% (n=68) low/moderate-achievers. This significant difference suggests that ethnicity may play a role in

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Table 2: An association of sociodemographic, breakfast habit, physical activity & sleep quality withcGPA among university students of University of Cyberjaya

Variables	cGPA of students		Chi Square	p-value
	High-achieving students (CGPA ≥ 3.0).	low/moderate-achieving students (CGPA < 3.0)		
	N (%)	N (%)		
Age			240.11	<0.001
18-25 years old	173 (53.2)	152 (46.8)		
26-30 years old	66 (95.7)	3 (4.3)		
Gender			264.07	<0.001
Male	206 (98.1)	4 (1.9)		
Female	33 (17.9)	151 (82.1)		
Ethnicity			37.51	<0.001
Malay	70 (46.4)	81 (53.6)		
Indian	15 (14.9)	86 (85.1)		
Chinese	69 (50.4)	68 (49.6)		
Others	1 (20.0)	4 (80.0)		
Breakfast habit			5.822	0.016
Good	82 (53.2)	72 (46.8)		
Bad	157 (65.4)	83 (34.6)		
Physical activity			45.55	<0.001
Low	18 (72.0)	7 (28.0)		
Moderate	151 (51.3)	143 (48.7)		
High	70 (93.3)	5 (6.7)		
Sleep quality			4.96	0.004
Yes	22 (88.0)	3 (12.0)		
No	217 (58.8)	152 (41.2)		

academic outcomes, with Malay and Chinese students more likely to perform better academically than Indian students in this sample.

The analysis also shows a significant association between breakfast habits and CGPA ($\chi2=5.822$, $P=0.016$). Among students with good breakfast habits, 53.2% (n=82) were high-achievers, while 46.8% (n=72) were low/moderate-achievers. Conversely, among students with poor breakfast habits, 65.4% (n=157) were high-achievers, and 34.6% (n=83) were low/moderate-achievers. Interestingly, while good breakfast habits are often associated with better cognitive function and academic performance, in this sample, students with poorer breakfast habits had a slightly higher proportion of high achievers, suggesting that other factors may also influence academic success beyond dietary patterns.

Physical activity level shows a highly significant association with CGPA ($\chi2=45.55$, $P<0.001$). Among students with low physical activity, 72.0% (n=18) were high-achievers, compared to 28.0% (n=7) who were low/moderate-achievers. For students engaging in moderate physical activity, 51.3% (n=151) were high-achievers, while 48.7% (n=143) were low/moderate-achievers. Among students with high physical activity levels, 93.3% (n=70) were high-achievers, with only 6.7% (n=5) in the low/moderate-achieving group. These findings suggest a positive correlation between physical activity and academic performance, with higher levels of physical activity associated with a greater likelihood of achieving higher CGPAs. This aligns with existing literature on the benefits of physical activity for mental health and cognitive function.

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Sleep quality also demonstrated a significant association with CGPA ($\chi 2=4.96$, P=0.004). Among students who reported good sleep quality, 88.0% (n=22) were high-achievers, while only 12.0% (n=3) were low/moderate-achievers. Conversely, among students with poor sleep quality, 58.8% (n=217) were high-achievers, and 41.2% (n=152) were low/moderate-achievers. These results support the well-documented relationship between sleep quality and cognitive performance, suggesting that students with better sleep quality are more likely to excel academically.

Discussion

The data highlights significant variations in students' cumulative GPAs (cGPAs) across different age groups, genders, and ethnicities. A statistically significant relationship between age and academic performance was established in this study. This suggests that younger students may perform better academically, possibly due to recent high school education and fewer external obligations. Conversely, older students might struggle with balancing work, family, and school. Our findings align with Pellizzariet al. (18), who observed that younger students outperform their older colleagues at the college level, tend to perform better in coursework that requires intense focus and fast adaptation to novel academic concepts. Zepke et al. (19) also found that younger students, due to their transitional phase into higher education, tend to be highly engaged with their academic work and are more likely to participate actively in class discussions and university activities.

On the other hand, Zhao and Kuh (20) contend that although younger students might show high levels of motivation and engagement at first, they are frequently more vulnerable to changes in their motivation as they adjust to university life. Additionally, they could find it difficult to handle the freedom and autonomy needed at university, especially during their first year.

Gender-wise, there is a significant correlation between gender and academic achievement, suggesting that targeted interventions might be necessary to support female students in achieving better academic results. Research highlights that initiatives promoting gender equity, such as mentorship programs and targeted academic support, are effective in addressing disparities in academic outcomes between genders. Programs designed to foster resilience, improve social support, and mitigate biases can significantly enhance academic engagement and performance for underrepresented groups (21).Scholars have been interested in gender disparities in academic achievement for a while (22, 23, 24,25). In fact, historically, men have performed better academically overall (25).

Ethnicity also plays a significant role in academic performance, it demonstrates a statistically significant correlation between ethnicity and academic achievement, indicating the need for culturally sensitive support structures and teaching strategies.

The scholarly literature is conflicting about the relationship between race and ethnicity on the one hand and academic achievement on the other (26). Some researchers believe there would be no correlation, while others believe there would be a positive or negative one. Others hypothesize that the setting and the ethnic groups involved would determine the strength and direction of relationships. Given these expectations, it is likely not unexpected that the existing research indicates correlations ranging from negative moderately small to positive moderately big. These differences in the direction and magnitude of the correlations point to the need for further contextualized studies (26,27).

The data reveals a significant correlation between breakfast habits and academic performance (cGPA) among students, which indicate a statistically significant relationship between breakfast habits and academic performance. Educational institutions should consider promoting better nutrition and time

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management practices among students. Implementing programs that ensure access to nutritious breakfasts could potentially enhance academic outcomes. Our findings are consistent with research highlighting the impact of nutrition on cognitive function, which suggests that a nutritious breakfast plays a critical role in supporting memory, concentration, and overall cognitive performance, thereby contributing to enhanced academic outcomes (28). However, the observation that many high-achieving students report poor breakfast habits indicates that other factors, such as study habits, sleep patterns, and stress levels, may also significantly impact academic performance. These findings are consistent with research showing that socioeconomic status, gender, and ethnicity are influential factors in determining academic success, as different demographic groups may face unique academic challenges and resources (29,30).

It is found that there is highly association between breakfast habits and education performance the students who consumed less food feel laziness and inactive during study they can't focus on the study. A vast majority of the respondents i.e.47% don't take breakfast often while most of the students missed one time meal often that become the cause of brain damage and makes the student cognitive level low. That becomes the cause of obtained low grades in education (31).

The number of times students eat breakfast per week has a significant impact on their comprehensive academic performance, which is reflected in the trend that the more times students eat breakfast, the better their overall academic performance is. Based on this, in order to help students eat breakfast more often, and further improve students' academic performance, we will strengthen the publicity and education of students' breakfast knowledge from multiple perspectives (32).

The study investigates the relationship between students' cumulative GPA (cGPA) and their levels of physical activity, a significant association between academic performance and physical activity levels is found. High-achieving students predominantly engage in moderate and high physical activity. High-achieving students are more likely to participate in higher levels of physical activity, suggesting a positive impact of physical activity on academic performance. Factors contributing to this association include cognitive benefits such as improved memory, concentration, and problem-solving skills, as supported by research demonstrating the positive effects of physical activity on cognitive function and academic performance (33). High-achieving students might also possess better time management skills, allowing them to balance academics and physical activity effectively, as research indicates that efficient time management practices are associated with better academic performance and reduced stress levels among university students (34).Moreover, regular physical activity is linked to improved mental health, reduced stress, and better overall well-being, which can enhance academic performance, as supported by findings demonstrating the positive association between physical activity and academic success among medical students (35). These results imply that educational institutions should promote physical activity through sports programs, physical education classes, and extracurricular activities to boost academic performance and overall health. Early education on the importance of physical health alongside academic achievement is crucial.

Since earlier studies showed improvements in various cognitive abilities, including execution, decision-making, perception, concentration, and memory, physical activity is believed to be a crucial component that could significantly affect academic performance (36,37,38). Additionally, earlier studies discovered a favorable association between increased academic achievement and intensive physical activity (39).

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Our study reveals intriguing findings where high-achieving students report poor sleep quality while maintaining high cGPA scores, which challenges the assumption that better academic performance is always linked to good sleep. This suggests that these students may utilize compensatory strategies, such as increased focus during study sessions or strategic napping, to counteract the negative impacts of poor sleep on their academic performance. Research shows that students often adapt their study behaviours and self-regulation skills to manage academic demands despite sleep deficits, thereby maintaining their performance (40). While sleep is crucial for cognitive functions like learning and memory consolidation (41), our results align with recent research that emphasizes the role of stress management and intrinsic motivation in buffering poor sleep's impact on academic outcomes, highlighting the importance of effective coping strategies and self-regulation skills in mitigating the negative effects of inadequate sleep (42).There was no discernible difference between students with good and low grades based on the quality of sleep questionnaire responses. Both groups did, however, have mild to moderate sleep disruptions (43).

Overall, higher grades were associated with more consistent, longer, and higher-quality sleep. Sleep duration and quality over the month and week prior to an exam were associated with higher scores, but there was no correlation between test performance and sleep metrics on the one night before an exam. Nearly 25% of the variation in academic performance was explained by sleep measurements. These results offer quantifiable, unbiased proof that higher sleep quality, duration, and consistency are highly correlated with improved college academic achievement (44). Better sleep is linked to a wide range of superior cognitive functions, including improved learning and memory, according to well-controlled sleep research done on healthy adults (45,46).

These findings have implications for educational policy and student health initiatives, highlighting the need for comprehensive wellness programs, addressing both sleep hygiene and underlying causes of sleep disturbances such as academic stress. Implementing workshops on stress and time management could help students achieve a healthier balance between academic responsibilities and sleep, improving both well-being and educational outcomes. Our study's reliance on self-reported sleep measures may introduce biases, and the cross-sectional design limits establishing causality between sleep quality and academic performance. Future research should explore compensatory mechanisms used by high-achieving students through longitudinal studies, monitoring sleep patterns, academic performance, and factors like stress levels and coping strategies. Experimental studies assessing targeted interventions on sleep and academic performance could offer practical strategies for enhancing student outcomes. Ultimately, while the link between sleep quality and academic performance is well-known, our study suggests that effective strategies may enable high-achieving students to excel academically despite poor sleep. This underscores the need for educational approaches that promote holistic wellness, such as stress management workshops, time management training, and sleep hygiene programs, as mentioned throughout our study, to enhance both academic success and student well-being.

Conclusion

This study highlights the complex interplay of lifestyle factors impacting academic performance among university students. It underscores the importance of breakfast in academic achievement and calls for holistic approaches to student health. Similarly, the link between physical activity and higher cGPA underscores the need for promoting active lifestyles on campus. The study also reveals varied impacts of sleep quality on academic performance,

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emphasizing its nuanced role. Sociodemographic factors, such as age, gender, and ethnicity further shape academic success, highlighting disparities that warrant attention for equitable educational outcomes. In conclusion, this research urges educational institutions to proactively support student well-being alongside academic rigour. Integrating lifestyle considerations into educational strategies can foster environments where all students thrive academically and personally.

Data analysis

After data collection, data are analysed using Jeffrey's Amazing Statistics Program (JASP) version 0.16.2 data analysis software[18]. Appropriate descriptive and inferential statistics is carried out by using JASP to describe the data. Chi-squared test is used to determine the association between certain lifestyle and cGPA levels among the community of University of Cyberjaya. It is considered statistically significant when the p-value is <0.05.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of University of Cyberjaya (Ethics Code: UOC/CRERC/AL-ER (39/2023). Informed consent was obtained from all respondents before distributing the questionnaire.

Data availability

The data produced and analyzed in this study are not publicly accessible due to ethical constraints but can be obtained from the corresponding author upon reasonable request.

Competing interests

The authors declare no competing interests.

References

1. Busalim, A. H., Hussin, A. R., & Dahlan, H. M. (2019). Exploring the determinants of students' academic performance at university level: The mediating role of internet usage continuance intention. Education and Information Technologies, 24, 1929–1941. https://doi.org/10.1007/s10639-019-09894-5:contentReference[oaicite:0]{index=0}.
2. Biwer, F., & De Bruin, A. (2023). The challenge of change: Understanding the role of habits in university students' self-regulated learning. Higher Education, 85(2), 197-216. https://doi.org/10.1007/s10734-021-00768-1.
3. Suhre, C., & Longden, B. (2007). Gender Differences in Academic Performance and Psychological Resilience: Understanding the Differences Through Gender Stereotypes. European Journal of Psychology of Education, 17, 263-275. https://doi.org/10.1007/s10212-007-0017-y.
4. UKM News. (2015). Integrated CGPA to Evaluate Overall Performance of Students. UKM News Portal. Retrieved fromhttps://www.ukm.my/news/Latest_News/integrated-cgpa-to-evaluate-overall-performance-of-students
5. Asian Journal of Business and Accounting. (2022). The Impact of Academic and Non-Academic Factors on University Performance. AJBA, 15(1), 71-81. Retrieved fromUniversity of Malaya AJBA(UM eJournal)
6. Marketing and Academic Services Department, Universiti Malaya. (2022). Overview of Academic Performance Factors. Universiti Malaya Academic Services. Retrieved fromhttps://masd.um.edu.my/
7. Curcio, G., Ferrara, M., & De Gennaro, L. (2006). Sleep loss, learning capacity, and academic performance. Sleep Medicine Reviews, 10, 323-37. https://doi.org/10.1016/j.smrv.2005.11.001
8. Voderholzer, U., Piosczyk, H., Holz, J., Landmann, N., et al. (2011). Effects of partial sleep deprivation on prefrontal cognitive functions in adolescents. Sleep and Biological Rhythms, 12(2), 170-178. https://doi.org/10.1016/j.sleep.2010.07.017:contentReference[oaicite:1]{index=1}.
9. Edefonti, V., Rosato, V., Parpinel, M., Nebbia, G., Fiorica, L., Fossali, E., Ferraroni, M., Decarli, A., &Agostoni, C. (2014). The effect of

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10.5530/ctbp.2025.4s.21

breakfast composition and energy contribution on cognitive and academic performance: a systematic review. The American Journal of Clinical Nutrition, 100(2), 626–656.https://doi.org/10.3945/AJCN.114.083683

10. World Health Organization. (2022). Promoting healthy active mobility. Retrieved fromhttps://www.who.int/europe/activities/promoting-healthy-active-mobility.

11. Ramires, V. V., dos Santos, P. C., & Barbosa Filho, V. C. (2023). Physical education for health among school-aged children and adolescents: A scoping review of reviews. Journal of Physical Activity and Health, 20(7), 586–599. https://doi.org/10.1186/s12966-020-01037-z.Methods

12. Brookings Institution. (2020). Digital Tools for Real-Time Data Collection in Education. *Brookings*. Available at:https://www.brookings.edu

13. Mitra, A. K. (2024). Sample Size Estimation. In: Mitra, A. K. (eds) *Statistical Approaches for Epidemiology*. Springer, Cham.https://doi.org/10.1007/978-3-031-41784-9_17.

14. Maddison R, Ni Mhurchu C, Jiang Y, Vander Hoorn S, Rodgers A, Lawes CM, Rush E. International Physical Activity Questionnaire (IPAQ) and New Zealand Physical Activity Questionnaire (NZPAQ): a doubly labelled water validation. Int J BehavNutr Phys Act. 2007 Dec 3;4:62. doi: 10.1186/1479-5868-4-62. PMID: 18053188; PMCID: PMC2219963.

15. Matthys, C., Henauw, S., Bellemans, M., Maeyer, M., & De Backer, G. (2007). Breakfast habits affect overall nutrient profiles in adolescents. *Public Health Nutrition*, 10(5), 413-421. https://doi.org/10.1017/S1368980007248049.

16. Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. Psychiatry Research, 28(2), 193-213. https://doi.org/10.1016/0165-1781(89)90047-4:contentReference [oaicite:0]{index=0.

17. JASP Team. (2022). Introducing JASP 0.16.2: Performance Improvements, Apple Silicon, and Bug Fixes. *JASP - Free and User-Friendly Statistical Software*. Retrieved fromhttps://jasp-stats.org/2022/04/19/introducing-jasp-0-16-2-performance-improvements-apple-silicon-and-bug-fixes/.

18. Pellizzari, Michele &Billari, Francesco. (2011). The younger, the better? Age-related differences in academic performance at university. Journal of Population Economics. 25. 697-739. 10.1007/s00148-011-0379-3.

19. Zepke, Nick & Leach, Linda & Butler, Philippa. (2010). Engagement in post-compulsory education: Students' motivation and action. Research in Post-Compulsory Education. 15. 1-17. 10.1080/13596740903565269.

20. Zhao, CM., Kuh, G.D. Adding Value: Learning Communities and Student Engagement. *Research in Higher Education* 45, 115–138 (2004). https://doi.org/10.1023/B:RIHE.0000015692.88534.de

21. Parsons, M., & Cooke, J. (2022). Promoting gender equity in academic outcomes through tailored interventions: A systematic review. Social Justice Research, 35(2), 1-18. https://doi.org/10.1007/s11211-022-09568-9.

22. Jackman WM, Morrain-Webb J. Exploring gender differences in achievement through student voice: critical insights and analyses. Cogent Education. 2019;6(1):1567895. doi: 10.1080/2331186X.2019.1567895. [DOI] [Google Scholar]

23. Morita N, Nakajima T, Okita K, Ishihara T, Sagawa M, Yamatsu K. Relationships among fitness, obesity, screen time and academic achievement in Japanese adolescents. Physiol Behav. 2016;163(1):161–166.

24. Sparks-Wallace OJ (2007) A study of gender differences in academic performance in a rural county in Tennessee. Electronic Theses and Dissertations. Paper 2101. https://dc.etsu.edu/etd/2101

25. Ullah R, Ullah H. Boys versus girls' educational performance: empirical evidences from global north and global south. AfrEduc Res J. 2019;7(4):163–167. doi: 10.30918/AERJ.74.19.036. [DOI] [Google Scholar]

Vol. 19 (Supplementary Issue 4), Oct-Dec 2025, ISSN 0973-8916 (Print)., 2230-7303 (Online)
10.5530/ctbp.2025.4s.21

26. Miller-Cotto D., Byrnes J.P. Ethnic/racial identity and academic achievement: A meta-analytic review. Dev. Review. 2016;41:51–70. doi: 10.1016/ j.dr.2016.06.003. Mosby Inc. [DOI] [Google Scholar] 29.Borenstein M., Hedges L., Rothstein H. Introduction to meta-analysis. 2007. www.Meta-Analysis.com

27. Kiely, K. M. (2014). Cognitive Function. In: Michalos, A. C. (Ed.), *Encyclopedia of Quality of Life and Well-Being Research*. Springer, Dordrecht. https://doi.org/10.1007/ 978-94-007-0753-5_426:content Reference[oaicite:0]{index=0.

28. Malakolunthu, S., &Rengasamy, N. C. (2012). Education policies and practices to address cultural diversity in Malaysia: Issues and challenges. Prospects, 42(2), 147–159.https://doi.org/10.1007/s11125-012-9227-9.

29. Caro, D. H., McDonald, J. T., &Willms, J. D. (2009). Socioeconomic status and academic achievement trajectories from childhood to adolescence. Canadian Journal of Education, 32(3), 558–590.

30. Esteban-Cornejo I, Tejero-Gonzalez CM, Sallis JF, Veiga OL. Physical activity and cognition in adolescents: A systematic review. J Sci Med Sport. 2015 Sep;18(5):534-9. doi: 10.1016/j.jsams.2014.07.007. Epub 2014 Jul 24. PMID: 25108657.

31. Arshad, Nadeem & Ahmed, Umair. (2014). Impact of Breakfast Habits on Education Performance of University Students (A Study Conducted on University of Sargodha, Pakistan). International Journal of Academic Research in Progressive Education and Development. 3. 10.6007/IJARPED/v3-i1/830.

32. Chen, X. , Chen, H. , Gong, L. , Fang, Y. , Luo, X. and Zhu, D. (2020) Relationship between Breakfast and Academic Performance of Primary and Middle School Students in Mianyang City. *Health*, 12, 1383-1389. doi: 10.4236/health.2020.1210100.

33. Little, B. (2018). Time Management. In: Zeigler-Hill, V., Shackelford, T. (eds) *Encyclopedia of Personality and Individual Differences*. Springer, Cham. https://doi.org/ 10.1007/978-3-319-28099-8_871-1: contentReference[oaicite:0]{index=0}.

34. Al-Drees A, Abdulghani H, Irshad M, Baqays AA, Al-Zhrani AA, Alshammari SA, Alturki NI. Physical activity and academic achievement among the medical students: A cross-sectional study. Med Teach. 2016;38 Suppl 1:S66-72. doi: 10.3109/0142159X. 2016.1142516. PMID: 26984037.

35. Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: a school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools*, 41(5), 537–550. https://doi.org/10.1002/ pits.10177.

36. Loprinzi P.D., Cardinal B.J., Loprinzi K.L., Lee H. Benefits and Environmental Determinants of Physical Activity in Children and Adolescents. Obes. Facts. 2012;5:597–610. doi: 10.1159/000342684. [DOI] [PubMed] [Google Scholar]

37. Donnelly J.E., Hillman C.H., Castelli D., Etnier J.L., Lee S., Tomporowski P., Lambourne K., Szabo-Reed A.N. Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review. Med. Sci. Sports Exerc. 2016;48:1197–1222. doi: 10.1249/MSS. 0000000000000901. [DOI] [PMC free article] [PubMed] [Google Scholar]

38. Gomes da Silva S., Arida R.M. Physical Activity and Brain Development. Expert Rev. Neurother. 2015;15:1041–1051. doi: 10.1586/14737175.2015.1077115. [DOI] [PubMed] [Google Scholar]

39. Edwards J.U., Mauch L., Winkelman M.R. Relationship of Nutrition and Physical Activity Behaviors and Fitness Measures to Academic Performance for Sixth Graders in a Midwest City School District. J. Sch. Health. 2011;81:65–73. doi: 10.1111/j.1746-1561.2010.00562.x. [DOI] [PubMed] [Google Scholar]

40. Walker MP. A refined model of sleep and the time course of memory formation. Behav Brain Sci. 2005 Feb;28(1):51-64;

discussion 64-104. doi: 10.1017/s014052 5x05000026. PMID: 16047457.

41. Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. *Springer Science & Business Media*. https://doi.org/ 10.1007/978-1-4419-1005-9:content Reference[oaicite:0]{index=0}.

42. Chambers, R., Lo, B. C. Y., & Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research*, 32(3), 303–322. https:// doi.org/10.1007/s10608-007-9119-0: contentReference[oaicite:0]{index=0.

43. Jalali R, Khazaei H, Paveh BK, Hayrani Z, Menati L. The Effect of Sleep Quality on Students' Academic Achievement. Adv Med Educ Pract. 2020 Jul 17;11:497-502. doi: 10.2147/AMEP.S261525. PMID: 32765154; PMCID: PMC7381801.

44. Okano, K., Kaczmarzyk, J.R., Dave, N. *et al.* Sleep quality, duration, and consistency are associated with better academic performance in college students. *npj Sci. Learn.* 4, 16 (2019). https://doi.org/10.1038/ s41539-019-0055-z

45. Diekelmann, S., Wilhelm, I. & Born, J. The whats and whens of sleep-dependent memory consolidation. *Sleep. Med. Rev.* 13, 309–321 (2009).Article Google Scholar

46. Fogel, S. M., Smith, C. T. & Cote, K. A. Dissociable learning-dependent changes in REM and non-REM sleep in declarative and procedural memory systems. *Behav. Brain Res.* 180, 48–61 (2007).