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PHYSICAL ACTIVITY LEVEL AND MENTAL HEALTH EFFECTS ON ACADEMIC PERFORMANCE POST COVID-19 PANDEMIC AMONG STUDENTS IN UITM PAHANG

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ABSTRACT

The global COVID-19 pandemic caused enormous changes in the educational system, with students shifting to distance learning and experiencing significant changes in their academic norms. Presently, the pandemic's transition to online learning has raised concerns about students' general state after COVID-19 pandemic, particularly their academic performance and well-being. The overarching purpose of this study is to determine the effects of physical activity and mental health on academic performance among students at the University of Technology Mara, Pahang Branch, Jengka Campus after COVID-19 pandemic. Data were collected from 354 students, including 196 diploma and 158 degree-level students, using questionnaires. The analysis was conducted using Spearman's rank correlation. This study utilized the Depression, Anxiety, and Stress Scale (DASS-21) and the Global Physical Activity Questionnaire (GPAQ) to assess psychological distress and physical activity levels, respectively. The study shows that a significant majority of students engage in moderate physical activity, while sedentary behavior is prevalent. Concerningly, a sizable proportion of students reported signs of mental health problems such as depression, anxiety, and stress. The findings also show that there is no substantial association between physical activity and academic performance. However, the study does find a small but statistically significant inverse relationship between mental health and academic performance, implying that students with higher total mental health scores may have slightly lower CGPAs. As a result, the findings highlight the significance of encouraging physical activity and treating mental health problems among university students, particularly in the post COVID-19 pandemic era. These findings are beneficial for encouraging the development of strategies and support services to focus at enhancing students' overall well-being and academic success.

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Keywords: *Physical Activity, Mental Health, Academic Performance, University Students, COVID-19 Pandemic.*

INTRODUCTION

The global spread of COVID-19 has caused an unprecedented shift in the process of education, affecting millions of students worldwide, including those in Malaysia. Academic institutions around the world, including Malaysia, temporarily shuttered their doors in reaction to the pandemic in order to slow the spread of the virus. This situation will have an impact on more than 90% of students worldwide (Bhasin et al., 2021). Following the pandemic, students have had to adapt to new learning methods. In education, the routine act of attending class was changed into "sitting at home" in front of the screen, posing new obstacles (Dios et al., 2021).

Malaysian higher education students, like their counterparts throughout the world, found themselves engaging in online, hybrid, mixed-mode, and web-enhanced face-to-face courses, which provided a temporary solution to the pandemic's restrictions. However, in the midst of this new educational landscape, students have experienced obstacles that have resulted in a phenomenon known as student burnout, which is caused by issues connected to online learning settings and insufficient internet connection (Basri et al., 2022). The pandemic has highlighted disparities in educational access, with people from poorer socioeconomic backgrounds suffering from higher rates of depression both before and during the outbreak (Ettman et al., 2020). These difficulties are not only academic; they also affect mental health, well-being, and physical activity patterns (Artiluhung et al., 2024).

Stringent confinement measures, along with stress, exhaustion, resource limits, and major behavioral changes, have clearly generated pressures that may have a negative impact on psychological health and physical activity during COVID-19 quarantines (Coakley et al., 2021). Recognizing this, it is critical to investigate the intricate relationships between physical activity levels, mental health conditions such as depression, anxiety, and stress symptoms, and their subsequent effects on university students' academic performance in the post-COVID-19 pandemic era (Permana et al., 2024).

METHOD

Research Design

This study employed a cross-sectional quantitative design, utilizing questionnaires to collect data. The analysis was conducted using quantitative methods to examine the relationship between physical activity levels and mental health conditions in relation to students' academic performance.

Participants

The study utilized convenience sampling, with 354 university students (diploma = 55.4%; degree = 44.6%) recruited in 2023 from the University of Technology Mara, Pahang Branch, Jengka Campus, Pahang, Malaysia. Students of both sexes, aged between 18 to 26 years old, were considered eligible for this study if they had the most recent examination results for certain semesters from October 2022 to February 2023, as well as their Cumulative Grade Point Average (CGPA). Every participant was provided with an informed consent form via a digital platform and was given the option to withdraw from the study at any time without penalty. The students received no academic credit or advantage for participating in this study. Their involvement was entirely voluntary. This study was approved by the Research Ethical Committee of University Technology Mara (UiTM), Pahang.

Procedures

The data were collected over the period spanning from August 2022 to December 2023. During this time, participants' socio-demographic information, encompassing factors such as age, academic progress, and

body mass index (BMI), was systematically gathered. The Depression, Anxiety, and Stress Scale - 21 Items (DASS-21) Questionnaire and The General Physical Activity Questionnaire (GPAQ) were used to collect data on mental health, physical exercise, and sedentary behavior, and it was assessed as follows.

The DASS-21 questionnaire was used to determine the major symptoms of depression, anxiety, and stress among students. The measure was made up of 21 items that were divided into three self-reported subscales. The items were graded on a Likert scale ranging from 0 to 3, where 0 did not apply to me at all, 1 applied to me to some degree or some of the time, 2 applied to me to a considerable degree or a good part of the time, and 3 applied to me very much or most of the time. The resulting grades were then categorized as "normal, mild, moderate, severe, or extremely severe" (Lovibond et al., 1995).

For the General Physical Activity Questionnaire (GPAQ), in brief, the participants needed to fill in sixteen structured questions to calculate how many MET-min of physical activity were performed in a typical week and to assess the individual's physical activity in these three domains, which were occupational physical activity, transport-related physical activity, and physical activity during discretionary or leisure time. The MET-min per week acquired from the GPAQ was a variable of the scale type. Moderate-intensity physical activity equaled 4 MET/min, while vigorous-intensity physical activity equaled 8 MET/min. The durations of each form of physical activity were multiplied by these coefficients when calculating weekly total MET-min (World Health Organization, 2021).

Statistical analysis

The data were analyzed with the Statistical Package for the Social Sciences (SPSS), which aided in the output of exact calculations for the research. The data were processed using descriptive and inferential analysis, with a focus on Spearman's rank correlation to analyze the relationships between variables in this study. Descriptive statistics like frequencies, percentages, and means were used to assess the value of data collected. Aside from that, the Spearman's rank correlation coefficient was used to measure the statistical relationship between two variables: physical activity level and sedentary behavior among university students, as well as mental health condition among university students, on their academic performances.

RESULT AND DISCUSSION

Descriptive Statistics

The characteristics of the individuals were thoroughly evaluated and are shown in Table 1. These characteristics include age, faculty, semester, level of education, household income, financial aid, marital status, weight, height, and cumulative grade point average (CGPA). To provide a full comprehension of the measures, the data is presented in the form of frequency, percentage, and mean ± standard deviation.

Table 1. Descriptive Statistics

Sociodemographic	F (%)	Mean ± SD
Age group		
18 – 20 years old	119 (33.6%)	
21 – 23 years old	227 (64.1%)	
24 – 26 years old	8 (2.3%)	
Gender		
Male	101 (28.5%)	
Female	253 (71.5%)	
Education Level		
Diploma	196 (55.4%)	
Degree	158 (44.6%)	
Faculty		
Faculty of Business and Management	58 (16.4%)	
School of Science	146 (41.2%)	

Faculty of Accountancy	22 (6.2%)	
Faculty of Plantation & Agrotechnology	8 (2.3%)	
Faculty of Sports Sciences & Recreation	42 (11.9%)	
School of Civil Engineering	55 (15.5%)	
School of Wood Industry	12 (3.4%)	
Faculty of Administrative Science and Policy Studies	11 (3.1%)	
Semester		
1	12 (3.4%)	
2	112 (31.6%)	
3	6 (1.7%)	
4	80 (22.6%)	
5	43 (12.1%)	
6	85 (24.0%)	
7	15 (4.2%)	
8	1 (0.3%)	
Household Income		
< RM 1500	124 (35.0%)	
RM 1501 – RM 2500	60 (16.9%)	
RM 2501 – RM 3500	45 (12.7%)	
RM 3501 – RM 4500	24 (6.8%)	
RM 4501 – RM 5500	14 (4.0%)	
> RM 5501	87 (24.6%)	
Financial Aid		
PTPTN	259 (73.2%)	
Scholarship	95(26.8%)	
Body Mass Index (BMI)		
Underweight	57 (16.1%)	
Normal Weight	204 (57.6%)	
Over weight	63 (17.8%)	
Obesity 1	21 (5.9%)	
Obesity 2	6 (1.7%)	
Obesity 3	3 (0.8%)	
Cumulative Grade Point Average (CGPA)		
2.49 and below	30 (8.5%)	
2.5 – 2.99	65 (18.4%)	
3.0 – 3.49	188 (53.1%)	
3.5 and above	71 (20.1%)	22.74 (4.70)

Note: F=Frequency; %=Percentage; BMI=Body Mass Index; CGPA=Cumulative Grade Point Average.

From the table 1, the majority of the participants are between the ages of 21-23 years old, representing 227 students (64.1%) of the total and the lowest age group is 24-26 years old, representing only 8 students (2.3%) of the total. The School of Science had the highest representation, with 146 students (41.2%) of participants, while the Faculty of Plantation & Agrotechnology had the lowest, with only 8 students (2.3%) of participation. The most participants are in semester 2, with 112 students (31.6%) of the total, indicating that the majority of participants are likely in the second phases of their academic journey and semester 8 has the least, with only 1 student (0.8%) of the total, showing that only one individual has completed his studies. There are 196 students, which representing (55.4%) of the participants that have a Diploma while the rest of 158 students, which representing (44.6%) of participation have a Degree. The income below RM1500 is recorded as the highest range of students that participated in this study, with 124 students (35.0%). There are 259 students (73.2%) that receive financial aid through PTPTN (National Higher Education Fund Corporation) and there are 95 students (26.8%) who receive scholarships. The vast majority of participants, 354 students (100%) are single, implying that married individuals are not included in this study's sample. The mean Body Mass Index (BMI) of the participants is 22.74 with a standard deviation of 4.70 and the majority of the participants fall into the “Normal Weight” category, with 204 students (57.6%).

The category with a CGPA of 3.0 – 3.49 have the highest representation, with 188 students (53.1%) of participation

Independent Variable (Physical Activity)

Table 2. Physical Activity Level

Variables	F (%)	Median (IQR)
P. Activity: Category		2.0 (1.0)
Low	126 (35.6%)	
Moderate	150 (42.4%)	
Vigorous	78 (22.0%)	
METmin/Week		
Moderate (METmin/Week)		90.0 (90.00)
Vigorous (METmin/Week)		30.0 (90.00)
Total (METmin/Week)		1080.0 (1800.0)
Sedentary		180.0 (240.0)

Note: F=Frequency; %=Percentage; P, Activity=Physical Activity.

From the table 2, the majority of the participants which are 150 students (42.4%) have a “Moderate” level of physical activity, indicating that a significant proportion of the participants engage in moderate physical activities while 126 students (35.6%) have a "Low" level and 78 students (22.0%) have a "Vigorous" level of physical activity. The Metabolic Equivalent Task (MET)-min per week shown that the median METmin/Week for "Moderate" physical activity level is 90.0, with an interquartile range of 90.00, indicating that half of the participants is engaging in moderate physical activities for at least 90 minutes per week within the range of 0 to 90 minutes per week, whereas the median METmin/Week for “Vigorous” physical activity level is 30.0, with an interquartile range of 90.00, indicating that half of the participants is engaging in vigorous physical activities for at least 30 minutes per week within the range of 0 to 90 minutes per week. Therefore, the median total METmin/Week for all participants is 1080.0, with an interquartile range of 1800.0, which indicating that half of the participants engage in physical activities resulting in at least 1080 minutes (18 hours) of METmin/week within the range of 0 to 1800 minutes per week. Lastly, the median time spent in sedentary activities is 180.0 minutes (3 hours), indicating that half of the participants spend at least 3 hours per day inactive.

Independent Variable (Mental Health)

Table 3. Mental Health Condition

Variables	F (%)
Depression	
Normal	120 (33.9%)
Mild	51 (14.4%)
Moderate	113 (31.9%)
Severe	35 (9.9%)
Extremely Severe	35 (9.9%)
Anxiety	
Normal	54 (15.3%)
Mild	48 (13.6%)
Moderate	87 (24.6%)
Severe	46 (13.0%)
Extremely Severe	119 (33.6%)

Stress	
Normal	188 (53.1%)
Mild	44 (12.4%)
Moderate	56 (15.8%)
Severe	45 (12.7%)
Extremely Severe	21 (5.9%)

Note: F=Frequency; %=Percentage.

From the table 3, for depression level, the majority of participants which is 120 students (33.9%) reported symptoms that fit into the "Depression – Mild" category. There is significant percentage of participants which is 35 students (9.9%) having "Depression – Severe" and another 35 students (9.9%) fit into "Depression – Extremely Severe" category. For anxiety level, the majority of participants which is 119 students (33.6%) reported "Anxiety – Extremely Severe" category, making it the most common category in the anxiety level while the "Anxiety – Mild" category and "Anxiety – Severe" category had almost equal representation, with 48 students (13.6%) and 46 students (13.0%) respectively. For stress level, the majority of participants which is 188 students (53.1%) reported having "Stress – Normal" category, indicating that a sizable proportion of the participants had a relatively good stress response. The smaller percentage of participants reported experiencing "Stress – Mild" which is 44 students (12.4%) and "Stress – Extremely Severe" which is about 21 students (5.9%) levels of stress.

Relationship Between Variables

Table 4. Correlation between dependent variable (Academic Performance) and independent variable (Mental Health Condition and Physical Activity Level)

Variables	Correlation Coefficient	Sig. (2-tailed)	n
Physical Activity	0.046	0.383	354
Mental Health	-0.113*	0.034	354

Correlation is significant at the 0.05 level (2-tailed).

From the table 4, it shown that the correlation coefficient between "CGPA" and "Physical Activity" is very low (0.046) and not statistically significant ($p = 0.383$), indicating that there is no significant relationship between the total minutes of physical activity per week and participants' CGPA. However, the correlation coefficient between "CGPA" and "Mental Health" is (-0.113) which is statistically significant at the 0.05 level ($p = 0.034$), indicating that there is a small but significant inverse relationship between the participants' mental health and their CGPA.

This study's findings shed light on the relationship between physical activity level, mental health condition, and academic performance among university students in UiTM Pahang. The findings reveal a worrying prevalence of sedentary behavior and symptoms of mental health issue among the participants. In addition, a negative association between mental health and academic performance was discovered, highlighting the importance of addressing mental health issues in order to enhance students' educational success.

According to the analysis, sedentary behavior in independent variable (physical activity level) was shown to be prominent in the study's data, with participants spending a significant amount of their time engaged in inactive pursuits, highlighting the need for more sport activities in participant's lives to support a healthy lifestyle and prevent sickness. This is consistent with previous research that emphasizes offering recreational facilities, sports programs, and active transportation activities on campus can improve students' health and reduce sedentary behavior (Barr-Anderson et al., 2008; Janeckova, 2021).

The analysis shown mental health symptoms during post COVID-19 pandemic are worrying, as a significant proportion of participants exhibited symptoms of depression, anxiety, and stress which consistent with previous research that emphasizes the change to online learning, social isolation, and uncertainty about the future can be distressing for students (Cao et al., 2020). To efficiently assist participants, cope with academic as well as personal challenges, universities have to prioritize mental well-being support services, including counseling and psychological interventions (Pedrelli et al., 2015).

The inverse relationship between mental health and academic performance emphasizes the importance of addressing students' psychological well-being. Studies have shown that heightened anxiety, stress, and psychological distress correlate with lower GPAs and academic achievement (Jehi et al., 2024; Tang & He, 2023). A meta-analysis by Tang and He (2023) found a negative correlation ($r \approx -0.21$) between anxiety and university students' academic success, while Jehi et al. (2024) reported that higher anxiety levels were significantly associated with lower GPAs. In addition, to ensure academic achievement, universities should undertake proactive procedures to detect and support students with mental health difficulties (Bruffaerts et al., 2018). Given these findings, addressing student mental health through targeted support and academic accommodations is crucial for mitigating the negative effects of anxiety on learning and performance, particularly in the aftermath of the COVID-19 pandemic (Freyhofer et al., 2021; Kishimoto et al., 2023). Overall, to enhance the study's conclusions, future research should include more diverse and representative populations, as well as objective measures of physical activity level and mental health condition (Haris et al., 2024).

CONCLUSION

The data reveal crucial insights that there is a substantial number of students that actively engage in moderate physical activity, while sedentary behaviors persistently consume a significant portion of their daily lives. Furthermore, the data also highlights the prevalence of mental health challenges among university students as there is a sizable proportion of participants reported symptoms of negative mental health issues such as depression, anxiety, and stress. The data also show that there is no substantial relationship between physical activity and academic performance. However, the study does find a small but statistically significant negative relationship between mental health and academic performance, highlighting that university students with higher mental health scores may have slightly lower CGPAs. These findings emphasize the need of treating students' mental health concerns, particularly in the aftermath of the COVID-19 outbreak, which has been linked to increased stress and anxiety, which may impair academic performance. In future, further study and focused interventions are required to better understand the details of the relationship between mental health and academic performance as well as to develop effective support measures for students during difficult times.

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CONFLICT OF INTREST

None

AUTHORS CONTRIBUTIONS

Conceptualization, N.N.S., N.F.I.M.H. and F.A.A.R.; formal analysis, N.N.S., N.F.I.M.H. and M.F.A.; investigation, N.F.I.M.H; methodology, N.N.S., N.F.I.M.H.; supervision, N.N.S; validation, A.G.Y., M.F.A. and N.N.S; writing—original draft, N.F.I.M.H.; writing—review and editing, N.N.S., F.A.A.R., A.G.Y. and M.F.A. All authors have read and agreed to the published version of the manuscript.

REFERENCES

Artiluhung, R. R., Mahendra, A., Yulianto, A. G., & Aman, M. S. (2024). Systematic Literature Review: Strategies for Active and Creative Learning in Elementary School Physical Education. *ACTIVE: Journal of Physical Education, Sport, Health and Recreation*, 13(3), 542–547

Barr-Anderson, D. J., AuYoung, M., Whitt-Glover, M. C., Glenn, B. A., Yancey, A. K., & Integration, C. C. C. (2008). Integration of short bouts of physical activity into organizational routine: a systematic review of the literature. *American Journal of Preventive Medicine*, 35(3), 304-317. https://doi.org/10.1016/j.amepre.2010.09.033.

Basri, S., Hawaldar, I. T., Nayak, R., & Rahiman, H. U. (2022, January 26). Do Academic Stress, Burnout and Problematic Internet Use Affect Perceived Learning? Evidence from India during the COVID-19 Pandemic. *MDPI*, 14(3), 18. https://doi.org/10.3390/su14031409

Bhasin, B., Gupta, G., & Malhotra, S. (2021, February). Impact of COVID-19 Pandemic on Education System. EPRA International *Journal of Environmental Economics, Commerce and Educational Management*, 8(2), 6 - 8. https://doi.org/10.36713/epra6363

Bruffaerts, R., Mortier, P., Kiekens, G., Auerbach, R. P., Cuijpers, P., Demyttenaere, K., ... & Kessler, R. C. (2018). Mental health problems in college freshmen: Prevalence and academic functioning. *Journal of Affective Disorders*, 225, 97-103. https://doi.org/10.1016/j.jad.2017.07.044

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, 287, 112934. https://doi.org/10.1016/j.psychres.2020.112934.

Coakley, K., Lardier, D., Holladay, K., Amorim, F. T., & Zuhl, M. (2021, July 9). Physical Activity Behavior and Mental Health Among University Students During COVID-19 Lockdown. *Physical Activity in the Prevention and Management of Disease*, 3, 8. https://doi.org/10.3389/fspor.2021.682175

Dios, M. T. C., & Charlo, J. C. P. (2021, June 15). Face-to-Face vs. E-Learning Models in the COVID-19 Era: Survey Research in a Spanish University (N. Gordon, Ed.). Online and Distance Learning during Lockdown Times: *COVID-19 Stories*, 11(6), 18. https://doi.org/10.3390/educsci11060293

Eisenberg, D., Golberstein, E., & Hunt, J. B. (2009). Mental health and academic success in college. *The BE Journal of Economic Analysis & Policy*, 9(1). https://doi.org/10.2202/1935-1682.2191

Freyhofer, S. et al. (2021). Depression and Anxiety in Times of COVID-19: How Coping Strategies and Loneliness Relate to Mental Health Outcomes and Academic Performance. *Frontiers in Psychology*, 12, Article 682684. https://doi10.3389/fpsyg.2021.682684.

Haris, I. N., Yulianto, A. G., Rosti, R., & Puniasari, N. L. (2024). Hasil Belajar Penjas Peserta didik Ditinjau Dari Segi Motivasi. *Biormatika: Jurnal Ilmiah Fakultas Keguruan Dan Ilmu Pendidikan*, *10*(1), 1–9.

Janeckova, K., Hamrik, Z., Matusova, M., Badura, P. "I am going out!" - lifestyle sports and physical activity in adolescents. *BMC Public Health*. 2021 Jun 5;21(1):1079. https://doi:10.1186/s12889-021-11066-3.

Jehi, T. et al. (2024). Anxiety, Depression, Stress, and Test Anxiety are Inversely Associated with Academic Performance Among Undergraduate Students Post-COVID-19 Confinement. *American Journal of Health Education*, 55(1), 1–11. https://doi:10.1080/19325037.2023.2296943.

Kishimoto, H. et al. (2023). Association between mental health and academic performance among university undergraduates: The interacting role of lifestyle behaviors. *Int. J. Methods in Psychiatric Research*, 32(1), e1933. https://doi:10.1002/mpr.1933.

Lovibond, S.H., & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. Dass21 questionnaire. Retrieved August 1, 2023, from https://maic.qld.gov.au/wp-

content/uploads/2016/07/DASS-21.pdf

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: mental health problems and treatment considerations. *Academic Psychiatry*, 39(5), 503-511. https://doi.org/10.1007/s40596-014-0205-9

Permana, G., Carsiwan, C., Juliantine, T., Yulianto, A. G., Aman, M. S., & Shahudin, N. N. (2024). The Contribution of Physical Education Teachers in Shaping Student Character. *ACTIVE: Journal of Physical Education*, Sport, Health and Recreation, 13(3), 552–556

Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Network Open*. 3: e2019686. doi: 10.1001/jamanetworkopen.2020.19686

Tang, Y., & He, W. (2023). Meta-analysis of the relationship between university students' anxiety and academic performance during COVID-19. *Frontiers in Psychology*, 14, Article 1018558. DOI: 10.3389/fpsyg.2023.1018558

World Health Organization. (2021, November 13). Global physical activity questionnaire (GPAQ). World Health Organization (WHO). Retrieved August 1, 2023, from https://www.who.int/publications/m/item/global-physical-activity-questionnaire