

Interrelationship of Physical Activity, Academic Stress, And Mental Health Among Tertiary Students: Basis for Wellness Program

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ABSTRACT: This study examined the association among physical activity, academic stress, and mental health among tertiary students as the basis for a proposed wellness program. Specifically, the study determined the level of physical activity in terms of frequency, intensity, time, and type (FITT), the level of academic stress, and the mental health status of students in terms of emotional, social, psychological, and overall well-being. It also examined the significant associations among the variables, including the mediating role of academic stress and the moderating role of physical activity. A quantitative–correlational research design was employed in the study involving 300 tertiary students from a private higher education institution selected through stratified random sampling. Standardized instruments utilized in the study included the International Physical Activity Questionnaire–Short Form (IPAQ-SF), Perceived Stress Scale (PSS-10), Mental Health Continuum–Short Form (MHC-SF), and the World Health Organization–Five Well-Being Index (WHO-5). Data were analyzed using descriptive statistics, Spearman Rho correlation, mediation analysis, and moderation analysis. The findings revealed that tertiary students generally demonstrated a moderate level of physical activity, with walking identified as the most frequently performed activity. However, most respondents experienced high to very high levels of academic stress. In terms of mental health, students generally exhibited moderate levels of emotional, social, psychological, and overall well-being. Results further revealed that physical activity was not significantly associated with academic stress but demonstrated significant positive associations with psychological well-being and overall well-being. In contrast, academic stress demonstrated significant negative associations with all dimensions of mental health. Mediation analysis revealed that academic stress did not significantly mediate the association between physical activity and mental health, while moderation analysis indicated that physical activity did not significantly moderate the association between academic stress and mental health. Based on the findings, a multi-component wellness program was proposed focusing on stress-management interventions, FITT-based physical activity programs, sleep hygiene education, counseling and mental health support services, social engagement activities, and sedentary behavior reduction initiatives. The findings highlight that academic stress remains a significant factor associated with students’ mental health, while physical activity serves as a complementary factor supporting selected aspects of student well-being.

KEYWORDS: academic stress, mental health, physical activity, tertiary students, wellness program

I. INTRODUCTION

Tertiary students today are navigating an increasingly demanding academic climate characterized by heavy workloads, tight deadlines, and high-performance expectations. These academic stressors often lead to adverse effects on students’ mental well-being, including anxiety, depression, sleep disturbances, and reduced emotional coping capacity (Pérez-Jorge et al., 2025). In recent years, such academic pressures have intensified alongside changes in learning modalities, assessment demands, and lifestyle patterns among college students. Such pressures are particularly evident among students at private higher education institutions, where the researcher observed a noticeable decline in participation in physical activities and an increasing tendency toward sedentary lifestyles. These observations highlight growing concerns regarding students’ capacity to balance academic demands with health-promoting behaviors. This observation motivated the researcher to examine how physical activity, or the lack thereof, influences students’ ability to manage academic stress and maintain mental wellness.

Physical activity has long been recognized as a significant protective factor for both physical and psychological health. Cross-sectional research shows a dose–response relationship in which students who engage in regular physical activity report lower levels of depression and anxiety (Du, Jiang, & Yuan, 2025). Systematic reviews further indicate that regular movement

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enhances mental health through mediating factors such as self-esteem, resilience, social support, and affect regulation (White et al., 2024; Li & Huang, 2025). These findings suggest that physical activity may play a direct and indirect role in supporting students' mental health. Similarly, structured physical education programs contribute to improved well-being. Han et al. (2025) found that university physical education courses enhance mental health not only through physical fitness but also by developing social adaptability and promoting consistent engagement in physical activities.

Academic stress, on the other hand, negatively affects students' lifestyle behaviors. AlHamlan et al. (2025) reported that higher levels of academic stress among university students were significantly associated with lower physical activity levels and poorer sleep quality. This evidence indicates that academic stress may function as a barrier to sustained engagement in health-enhancing behaviors. These findings suggest a cyclical relationship in which stress reduces motivation for physical activity, while inactivity, in turn, increases vulnerability to mental health problems. Such a cycle underscores the potential role of academic stress as both an outcome and an intervening factor in the relationship between physical activity and mental health.

This dynamic relationship highlights an important research gap. While many studies have examined the individual effects of physical activity or academic stress on mental health, few have explored their combined and interrelated associations among Filipino tertiary students, particularly within private higher education institutions. Recent local reports further highlight the growing concern regarding student mental health in the Philippines. According to national mental health assessments and university-based surveys conducted after the COVID-19 pandemic, a significant proportion of Filipino tertiary student's report experiencing moderate to high levels of stress, anxiety, and academic burnout. These trends emphasize the urgent need for institution-based wellness initiatives that address both lifestyle behaviors and academic pressures within the Philippine higher education context. Moreover, limited local research has examined whether academic stress explains or alters the strength of the association between physical activity and mental health. Understanding these interactions is essential for designing effective programs that foster both academic resilience and mental well-being among students.

This study also supported the objectives of the United Nations Sustainable Development Goals, specifically Goal 3 on Good Health and Well-being and Goal 4 on Quality Education. These goals emphasize the importance of ensuring inclusive and equitable access to education that promotes both intellectual and emotional development. By situating student wellness within a public health and educational framework, this study sought to contribute to sustainable educational practices that promote balance between learning and wellness through evidence-based lifestyle and mental health strategies.

Therefore, this study aimed to examine the associations between physical activity, academic stress, and mental health among tertiary students at the institution. It further sought to determine whether academic stress mediated or moderated the relationship between physical activity and mental health. The findings were expected to serve as the basis for developing a proposed wellness program that promotes physical activity as a strategy to reduce academic stress and improve mental health. Through this initiative, the study sought to support the holistic development of Filipino college students by enhancing both their academic performance and psychological well-being.

Theoretical framework

This study was anchored on three interrelated theories that collectively explain the dynamic relationship among physical activity, academic stress, and mental health among tertiary students. These are the Transactional Model of Stress and Coping, the Self-Determination Theory, and the Biopsychosocial Model of Health.

The Transactional Model of Stress and Coping developed by Lazarus and Folkman (1984) provides a foundation for understanding how individuals perceive and manage stressors in their environment. Within the context of this study, academic challenges such as heavy workloads, tight deadlines, and examinations are considered stressors that students continuously appraise. According to the model, coping responses such as engagement in physical activity serve as adaptive strategies that mitigate the negative effects of academic stress on mental health. From this perspective, academic stress may function as an intervening or mediating factor through which physical activity influences mental health outcomes. Recent studies have reinforced this concept by demonstrating that adaptive coping strategies contribute significantly to resilience and improved psychological well-being among students (Pérez-Jorge et al., 2025).

The Self-Determination Theory proposed by Deci and Ryan (1985) further supports this study by emphasizing the role of intrinsic motivation in maintaining well-being. This theory suggests that individuals are motivated to achieve growth and psychological health when their basic psychological needs for autonomy, competence, and relatedness are satisfied. In the context of physical activity, these needs are fulfilled when students engage in self-selected, meaningful, and socially interactive forms of exercise. Li and Huang (2025) found that regular participation in such activities enhances intrinsic motivation and emotional well-being, making physical activity a crucial factor in promoting mental health among tertiary students. Accordingly, physical activity

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may strengthen or buffer the impact of academic stress on mental health, supporting its potential moderating role in the stress–mental health relationship.

Lastly, the Biopsychosocial Model of Health introduced by Engel (1977) highlights the integration of biological, psychological, and social components in shaping human health. In this study, physical activity represents the biological component, academic stress reflects the psychological domain, and peer or institutional support embodies the social aspect. Together, these factors interact to influence students' overall mental health outcomes. Recent applications of this model in higher education research confirm that student wellness is best understood through this multidimensional lens, where lifestyle behaviors such as exercise act as mediating factors in the relationship between stress and health (Han et al., 2025).

By grounding this study in these three theoretical perspectives, the research acknowledged that academic stress is not only a cognitive and emotional burden but also a physiological and social experience. The frameworks collectively justify examining academic stress as a mediator and physical activity as a moderator in relation to mental health outcomes. Physical activity functions as a vital coping mechanism that bridges these dimensions, helping students manage stress more effectively while promoting holistic well-being. The integration of these frameworks provided a comprehensive foundation for analyzing the interrelationship among physical activity, academic stress, and mental health among tertiary students at the institution.

Research Question

This study examined the association among physical activity, academic stress, and mental health among tertiary students in the institution. Specifically, it determined the level of physical activity in terms of frequency, intensity, time, and type (FITT), the level of academic stress, and the mental health status of students in terms of emotional, social, psychological, and overall well-being. The study further examined the significant associations among the variables, including the mediating role of academic stress and the moderating role of physical activity. The findings served as the empirical basis for the development of a proposed wellness program for tertiary students.

Specifically, this study sought to answer the following questions:

1. What is the level of physical activity of tertiary students in terms of:
 - 1.1 frequency;
 - 1.2 intensity;
 - 1.3 time; and
 - 1.4 type (FITT)?
2. What is the level of academic stress among tertiary students?
3. What is the mental health status of tertiary students in terms of:
 - 3.1 emotional well-being;
 - 3.2 social well-being;
 - 3.3 psychological well-being; and
 - 3.4 overall well-being?
4. Is there a significant association between physical activity and academic stress among tertiary students?
5. Is there a significant association between physical activity and mental health status among tertiary students?
6. Is there a significant association between academic stress and mental health status among tertiary students?
7. Does academic stress significantly mediate the association between physical activity and mental health among tertiary students?
8. Does physical activity significantly moderate the association between academic stress and mental health among tertiary students?
9. Based on the findings of the study, what wellness program may be proposed to promote physical activity, reduce academic stress, and enhance the mental health of tertiary students?

II. SCOPE AND LIMITATION OF THE STUDY

This study examined the association among physical activity, academic stress, and mental health among tertiary students of STI College Muñoz-EDSA during the Academic Year 2025–2026. Specifically, it focused on determining the level of physical activity in terms of frequency, intensity, time, and type (FITT), the level of academic stress, and the mental health status of students in terms of emotional, social, psychological, and overall well-being.

The study utilized a quantitative-correlational research design using standardized instruments, namely the International Physical Activity Questionnaire–Short Form (IPAQ-SF), Perceived Stress Scale–10 (PSS-10), Mental Health Continuum–Short Form

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(MHC-SF), and the WHO-5 Well-Being Index. The study further examined the significant associations among the variables, including the mediating role of academic stress and the moderating role of physical activity in relation to mental health.

The respondents of the study were 300 tertiary students officially enrolled at STI College Muñoz-EDSA during the Academic Year 2025–2026. Data were gathered using self-administered questionnaires and analyzed using appropriate descriptive and inferential statistical tools.

The study was limited to one private higher education institution; therefore, the findings may not be generalized to other institutions or populations. The study also relied on self-reported responses, which may be subject to recall bias and social desirability bias. Moreover, the study did not establish causal relationships since it employed a non-experimental correlational design. Other variables such as socioeconomic status, family background, and major life events were not included in the study.

FRAMEWORK

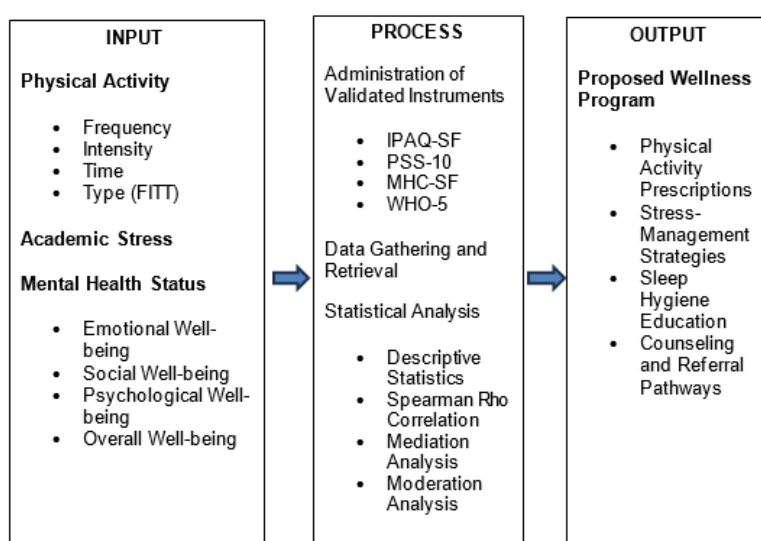


Figure 1. *Conceptual Paradigm*

The research paradigm illustrates the association among physical activity, academic stress, and mental health among tertiary students using the IPO model. Physical activity was treated as the independent variable and moderating variable; academic stress served as the mediating variable, and mental health served as the dependent variable. The paradigm further shows that the statistical analyses conducted in the study, including correlation, mediation, and moderation analyses, served as the basis for the development of the proposed wellness program for tertiary students.

Research Design

This study utilized a quantitative-correlational research design to examine the association among physical activity, academic stress, and mental health among tertiary students at STI College Muñoz-EDSA. The quantitative approach was appropriate because it involved the collection and statistical analysis of measurable data to determine the strength and direction of associations among the study variables.

The descriptive component of the study determined the level of physical activity in terms of frequency, intensity, time, and type (FITT), the level of academic stress, and the mental health status of tertiary students in terms of emotional, social, psychological, and overall well-being. This provided a profile of the respondents' physical activity participation, stress levels, and mental health conditions within the academic setting.

The correlational component examined the significant associations among physical activity, academic stress, and mental health using appropriate inferential statistical analyses. The study further examined the mediating role of academic stress in the association between physical activity and mental health, as well as the moderating role of physical activity in the association between academic stress and mental health. These analyses provided a deeper understanding of how the variables interact among tertiary students.

The findings of the study served as the basis for the development of a proposed wellness program intended to promote physical activity, reduce academic stress, and enhance the mental health of tertiary students.

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Research Instrument

The primary instrument used in the study was a structured survey questionnaire composed of standardized and validated instruments intended to measure physical activity, academic stress, and mental health among tertiary students. The questionnaire was not researcher-made; rather, it consisted of adopted international instruments that have been widely utilized in health, psychology, and educational research. The use of standardized instruments ensured the validity, reliability, and consistency of the data gathered in the study.

The questionnaire consisted of five parts:

Part A. Demographic Profile

The first part gathered the demographic characteristics of the respondents, including age, sex assigned at birth, year level, academic program, typical sleep duration during school nights, and the presence of chronic health conditions that may affect physical activity participation. These variables were used to describe the respondents and serve as possible covariates in the analysis.

Part B. Physical Activity Participation

The second part assessed the respondents' level of physical activity using the International Physical Activity Questionnaire–Short Form (IPAQ-SF) developed by Craig et al. (2003). The instrument measured physical activity participation over the past seven days in terms of frequency, duration, and intensity of activities, including vigorous activities, moderate activities, walking, and sedentary behavior.

The IPAQ-SF was used to determine the respondents' level of physical activity in terms of the FITT principle. The instrument has demonstrated acceptable reliability across international populations, with reported reliability coefficients ranging from 0.70 to 0.88.

Part C. Academic Stress

The third part measured academic stress using the Perceived Stress Scale–10 (PSS-10) developed by Cohen, Kamarck, and Mermelstein (1983). The instrument assessed the degree to which respondents perceived situations in their academic life as stressful during the past two weeks.

The respondents answered the items using a 5-point Likert scale ranging from 0 (Never) to 4 (Very Often), where higher scores indicated higher levels of perceived stress. The PSS-10 has demonstrated good internal consistency reliability, with Cronbach's alpha values commonly ranging from 0.78 to 0.91.

Part D. Mental Health Status

The fourth part assessed the respondents' mental health status using the Mental Health Continuum–Short Form (MHC-SF) developed by Keyes (2002). The instrument measured emotional well-being, social well-being, and psychological well-being over the past month.

Responses were rated using a 6-point frequency scale ranging from 0 (Never) to 5 (Every Day). The MHC-SF has demonstrated strong psychometric properties, with reported Cronbach's alpha values ranging from 0.80 to 0.89.

Part E. Overall Well-Being

The fifth part utilized the World Health Organization–Five Well-Being Index (WHO-5) developed by the World Health Organization (1998) to assess the respondents' overall subjective well-being during the past two weeks.

The instrument used a 6-point scale ranging from 0 (At No Time) to 5 (All of the Time), where higher scores indicated better well-being. The WHO-5 has been widely used as a brief measure of psychological well-being and has demonstrated high reliability in various studies.

Prior to the actual data gathering, the questionnaire underwent expert review to ensure clarity of instructions, organization of content, and suitability to the objectives of the study. A pilot test was likewise conducted to assess the internal consistency of reliability of the combined instruments before the final administration of the respondents.

Data Gathering

Before the actual conduct of the study, the researcher first secured written approval from the Research Office and the College Dean of the institution to formally administer the research instrument to the identified respondents. Upon approval, the researcher coordinated with program heads and faculty members to schedule data collection sessions at appropriate times that did not disrupt academic activities or examinations.

Prior to data collection, a brief orientation was conducted to inform potential participants about the purpose of the study, its objectives, procedures, expected duration, and their rights as respondents. These rights included the voluntary nature of participation, the right to withdraw at any time without penalty, confidentiality of responses, and anonymity of identities. Written

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informed consent was distributed and collected, ensuring that only students who voluntarily agreed to participate were included in the study.

The validated and pilot-tested survey questionnaire composed of the IPAQ-SF, PSS-10, MHC-SF, and WHO-5 was then administered to the respondents, either through face-to-face administration during free class periods or via an online platform such as Google Forms, depending on accessibility and feasibility. Each participant was allotted approximately 20–25 minutes to complete the instrument. For paper-based surveys, the researcher personally collected the accomplished questionnaires immediately after completion to prevent loss or unauthorized access. For online administration, responses were automatically stored in a password-protected Google Sheet accessible only to the researcher.

After data collection, the researcher screened all responses for completeness and eligibility. Incomplete or invalid questionnaires were excluded from analysis. Only valid responses were encoded into a statistical database using the Statistical Package for the Social Sciences (SPSS). Descriptive statistical procedures were first applied to summarize respondents' physical activity levels, academic stress, and mental health status. This was followed by inferential statistical analyses to examine the relationships among variables, including correlation analysis, mediation analysis to determine whether academic stress explained the relationship between physical activity and mental health, and moderation analysis to assess whether physical activity buffered the effect of academic stress on mental health, in accordance with the Statement of the Problem.

After data analysis, the researcher interpreted the results and used the findings as the empirical basis for the development of a proposed wellness program. This program was designed to promote physical activity as a strategy for reducing academic stress and enhancing mental health among tertiary students at the institution. The proposed wellness program was subjected to expert evaluation by professionals in physical education, psychology, and student development for refinement and possible institutional recommendation.

Statistical Treatment

The collected data were analyzed using appropriate descriptive and inferential statistical tools to address the research questions of the study. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) with a 0.05 level of significance.

The following statistical treatments were utilized:

Frequency and Percentage. Frequency and percentage were used to describe the respondents' background information and summarize the level of physical activity in terms of frequency, intensity, time, and type (FITT).

Mean and Standard Deviation. Mean and standard deviation were used to determine the level of academic stress and mental health status of the respondents. These statistical measures were applied in interpreting the scores obtained from the Perceived Stress Scale–10 (PSS-10), Mental Health Continuum–Short Form (MHC-SF), and WHO-5 Well-Being Index.

Spearman Rho Correlation. Spearman Rho correlation analysis was used to determine the significant association among the major variables of the study, specifically between:

- (a) physical activity and academic stress;
- (b) physical activity and mental health; and
- (c) academic stress and mental health.

Spearman Rho was utilized because it is an appropriate non-parametric statistical tool for determining the strength and direction of association between variables that may not satisfy the assumptions of normal distribution.

Mediation Analysis. Mediation analysis was conducted to determine whether academic stress significantly mediated the association between physical activity and mental health among tertiary students. The analysis examined whether physical activity indirectly influenced mental health through academic stress using regression-based procedures through PROCESS Macro Model 4.

Moderation Analysis. Moderation analysis was employed to determine whether physical activity significantly moderated the association between academic stress and mental health among tertiary students. The analysis examined whether the strength or direction of the relationship between academic stress and mental health varied across levels of physical activity using the PROCESS Macro Model 1.

Control Variables. Selected background variables such as age, sex assigned at birth, year level, sleep duration, and presence of chronic health condition were considered as control variables where statistically appropriate to minimize possible confounding effects in the mediation and moderation analyses.

The results of these statistical analyses served as the basis for interpreting the association among physical activity, academic stress, and mental health, and for developing the proposed wellness program for tertiary students.

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III. RESULTS

This section presents the level of physical activity of tertiary students in terms of frequency, intensity, time, and type (FITT) using the International Physical Activity Questionnaire–Short Form (IPAQ-SF). The findings describe the respondents' physical activity participation and overall activity classification.

Table 1. Level of Physical Activity of the Respondents in Terms of Frequency, Intensity, Time, and Type (FITT) using the International Physical Activity Questionnaire–Short Form (IPAQ-SF)

FITT Component	Intensity	
	mean	sd
Frequency (days)		
Vigorous	2.35	1.90
Moderate	2.80	2.10
Walking	5.02	2.11
Time (minutes)		
Vigorous	37.18	51.54
Moderate	38.57	58.66
Walking	45.98	72.80
Total MET-min/week	2242.35	3606.68
Type	f	%
Low	73	24%
Moderate	123	41%
High	104	35%

Table 1 presents the level of physical activity of the respondents. The findings revealed that most of the respondents demonstrated a moderate level of physical activity, with 41% classified under moderate activity, 35% under high activity, and 24% under low activity. The computed total energy expenditure of 2242.35 MET-minutes per week further indicates a generally moderate level of physical activity among tertiary students.

In terms of frequency, walking obtained the highest mean score ($M = 5.02$ days), followed by moderate-intensity activities ($M = 2.80$ days) and vigorous-intensity activities ($M = 2.35$ days). This indicates that walking was the most performed physical activity among the respondents, suggesting a preference for more accessible and less strenuous forms of movement.

With respect to duration, walking also recorded the highest average time ($M = 45.98$ minutes), followed by moderate-intensity activities ($M = 38.57$ minutes) and vigorous-intensity activities ($M = 37.18$ minutes). However, the large standard deviations indicate variability in the amount of time spent on physical activities among the respondents.

The findings suggest that while the respondents generally engaged in moderate levels of physical activity, a considerable proportion still belonged to the low activity category, indicating the possible presence of sedentary behaviors among some students. This finding supports the study of Gao et al. (2023), which emphasized that low physical activity and prolonged sedentary behavior among tertiary students may negatively affect health and well-being.

The results further support the findings of Brown et al. (2024), who reported that students commonly engage in convenient and accessible physical activities such as walking due to academic demands and time limitations. Similarly, Huang et al. (2024) emphasized that regular and sustained physical activity contributes positively to students' physical and psychological well-being.

Overall, the findings indicate that tertiary students generally demonstrated a moderate level of physical activity, primarily through walking and moderate-intensity activities. However, the presence of students classified under low physical activity highlights the need for institutional wellness initiatives that encourage regular participation in physical activity and reduction of sedentary behaviors.

Level of Academic Stress of Tertiary Students

This section presents the level of academic stress among tertiary students using the Perceived Stress Scale–10 (PSS-10).

Table 2. Perceived Stress Scale (PSS) Score of the Participants

Perceived Stress Score	Frequency (f)	Percentage (%)
Very Low (0–7)	6	2%
Low (8–11)	11	4%
Average (12–15)	26	9%
High (16–20)	103	34%
Very High (21 and over)	154	51%

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Table 2 presents the perceived stress levels of the respondents. The findings revealed that most of the respondents experienced elevated levels of academic stress, with 51% classified under very high stress and 34% under high stress. Only a small proportion of the respondents reported average (9%), low (4%), and very low (2%) stress levels.

The results indicate that academic stress was highly prevalent among tertiary students. The large proportion of respondents experiencing high to very high stress levels suggests that students were exposed to considerable academic demands and pressures within the tertiary academic environment. Academic workload, examination requirements, deadlines, and performance expectations may have contributed to the elevated stress levels experienced by the respondents.

The findings support the study of Pérez-Jorge et al. (2025), who emphasized that excessive academic workload contributes significantly to stress and emotional strain among students. Similarly, Olson et al. (2025) reported that continuous academic demands may lead to burnout, fatigue, and reduced academic motivation among tertiary students.

Moreover, Ruiz-Camacho (2025) explained that prolonged time pressure and overlapping academic responsibilities contribute to psychological distress and reduced coping ability among students. Likewise, Chen et al. (2024) noted that examination-related anxiety significantly affects the mental health and well-being of college students.

Overall, the findings suggest that tertiary students experienced high levels of academic stress, indicating the need for institutional support programs and wellness initiatives that may help students manage academic demands and promote psychological well-being.

Perceived Stress Scale (PSS) Item-Level Mean Responses

This section presents the item-level mean responses of tertiary students on the Perceived Stress Scale–10 (PSS-10). The table provides a more detailed description of the respondents' stress-related experiences, including their emotional reactions, perceived control, coping capacity, and difficulties encountered within the academic environment. The results help identify the specific stress indicators most commonly experienced by the respondents and provide deeper insights into their overall academic stress condition.

Table 3. Perceived Stress Scale (PSS) Item-Level Mean Responses

Indicator	Mean	SD
Upset due to unexpected events	2.37	1.09
Unable to control important things	2.26	1.16
Felt nervous and stressed	2.65	1.07
Felt confident in handling problems	1.66	1.12
Felt things were going your way	1.80	1.05
Unable to cope with responsibilities	1.97	1.12
Able to control irritations	1.65	1.07
Felt on top of things	2.09	1.14
Angered by uncontrollable events	2.17	1.15
Difficulties piling up	2.16	1.20
Total Mean	2.08	1.16

Note: Items were reverse-coded.

At the item level, the overall mean score ($M = 2.08$, $SD = 1.16$) indicates that the respondents moderately experienced stress-related situations in their academic life. The highest mean score was observed in the item “felt nervous and stressed” ($M = 2.65$), followed by “upset due to unexpected events” ($M = 2.37$) and “unable to control important things” ($M = 2.26$). These findings suggest that emotional strain, unpredictability, and perceived lack of control were among the most experienced stressors of tertiary students.

The findings support Ruiz-Camacho (2025), who explained that academic uncertainty, time pressure, and excessive responsibilities contribute significantly to psychological distress among students. Similarly, Chen et al. (2024) emphasized that persistent academic demands and examination-related pressures are associated with increased stress and emotional exhaustion among college students.

Lower mean scores were observed in the reverse-coded items such as “felt confident in handling problems” ($M = 1.66$), “able to control irritations” ($M = 1.65$), and “felt things were going your way” ($M = 1.80$). Since these items were reverse-coded, the results indicate less frequent experiences of confidence, emotional control, and effective coping among the respondents.

Moderate mean scores were likewise observed in items related to coping difficulty and emotional burden, including inability to cope with responsibilities ($M = 1.97$), anger caused by uncontrollable situations ($M = 2.17$), and feelings that difficulties

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were piling up ($M = 2.16$). These findings suggest that students experienced varying levels of stress management difficulties and emotional strain within the academic environment.

Overall, the findings indicate that tertiary students moderately experienced stress-related situations, particularly emotional tension, lack of control, and coping difficulties. These results highlight the importance of institutional wellness initiatives and stress-management programs that may help students strengthen coping strategies and psychological well-being.

Mental Health Status of Tertiary Students

This section presents the mental health status of tertiary students in terms of emotional, social, and psychological well-being using the Mental Health Continuum–Short Form (MHC-SF).

Table 4. Mental Health Continuum–Short Form (MHC-SF) Classification of the Participants

Mental Health Status Classification	Frequency (f)	Percentage (%)
Flourishing	103	34%
Moderate	157	52%
Languishing	40	13%

Table 4 presents the mental health status classification of the respondents. The findings revealed that most of the respondents were classified under the moderate mental health category (52%), followed by flourishing (34%) and languishing (13%). These findings indicate that while many students demonstrated functional levels of mental health and well-being, a considerable proportion had not yet achieved optimal psychological functioning.

The results suggest that tertiary students generally maintain moderate levels of emotional, social, and psychological well-being despite the academic pressures experienced within the academic environment. This finding supports the World Health Organization (2023), which emphasized that mental health exists on a continuum where individuals may continue functioning despite experiencing psychological strain and stress.

The presence of respondents classified as flourishing indicates that some students were able to maintain positive emotional functioning, healthy social relationships, and psychological resilience. This finding supports Campoamor Olegario et al. (2025), who explained that adaptive coping mechanisms, supportive environments, and positive lifestyle behaviors contribute to improved well-being among tertiary students.

However, the proportion of students classified under languishing suggests that some respondents may have experienced low levels of well-being and greater vulnerability to emotional and psychological distress. Auerbach et al. (2023) similarly reported that university students commonly experience varying levels of mental health difficulties associated with academic demands and stress-related experiences.

Notably, despite the high levels of academic stress identified in the previous section, not all respondents demonstrated poor mental health outcomes. This suggests that protective factors such as coping ability, social support, and physical activity participation may help buffer the negative effects of stress on mental health, consistent with the findings of Teuber et al. (2024).

Overall, the findings indicate that tertiary students generally demonstrated moderate mental health status, although a portion of the respondents remained vulnerable to psychological distress. These results highlight the importance of wellness initiatives and mental health support programs that may strengthen students' coping capacity and overall well-being.

World Health Organization–Five (WHO-5) Well-Being Index Scores of the Participants

This section presents the overall well-being of tertiary students using the World Health Organization–Five Well-Being Index (WHO-5). The results describe the respondents' level of positive well-being, emotional functioning, and general life satisfaction.

Table 5. World Health Organization–Five (WHO-5) Well-Being Index Scores of the Participants

Measure	Mean	SD	Min	Max	Scale
WHO-5 Raw Mean	3.19	1.00	0.00	5.00	0–5
WHO-5 Raw Total	15.93	4.99	0.00	25.00	0–25
WHO-5 (0–100)	63.72	19.95	0.00	100.00	0–100

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Table 5 presents the WHO-5 Well-Being Index scores of the respondents. The findings revealed a mean raw score of 3.19 (SD = 1.00), indicating a moderate level of positive well-being among tertiary students. Similarly, the total mean score of 15.93 out of 25 suggests that the respondents moderately experienced positive emotions and general life satisfaction.

When converted to the standardized 0–100 scale, the respondents obtained a mean score of 63.72 (SD = 19.95), reflecting a moderate to relatively favorable level of overall well-being. However, the large standard deviation and the wide range of scores indicate variability in the respondents' well-being experiences. This suggests that while some students demonstrated high levels of well-being, others may have experienced lower levels of psychological wellness.

The findings support Browning et al. (2021), who reported that college students commonly experience fluctuations in emotional well-being due to academic pressures, adjustment difficulties, and life transitions. Similarly, Liu et al. (2024) emphasized that engagement in health-promoting behaviors and effective coping strategies contributes positively to psychological well-being among students.

Overall, the findings indicate that tertiary students generally demonstrated moderate levels of overall well-being, although variations in well-being were evident among the respondents. These results highlight the importance of wellness initiatives and mental health support programs that promote positive emotional functioning, resilience, and holistic student well-being.

Significant Association Between Physical Activity and Academic Stress

This section presents the association between physical activity and academic stress among tertiary students using Spearman Rho correlation analysis.

Table 6. Spearman Rho Correlation Between Physical Activity and Academic Stress Among Tertiary Students

Variables	Spearman rho	p-value (sig.)	Interpretation
Physical Activity (IPAQ) vs Academic Stress (PSS)	-0.002	0.977	Not Significant

Table 6 presents the correlation between physical activity and academic stress among tertiary students. The computed Spearman Rho correlation coefficient ($p = -0.002$) indicates a negligible inverse association between physical activity and academic stress. Furthermore, the obtained p-value ($p = 0.977$) is greater than the 0.05 level of significance, indicating that the association is not statistically significant. Thus, the null hypothesis stating that there is no significant association between physical activity and academic stress among tertiary students was not rejected.

The findings suggest that physical activity was not significantly associated with the respondents perceived academic stress. Although physical activity is commonly recognized as a strategy for stress reduction, the results indicate that other factors may have contributed more strongly to the academic stress experienced by tertiary students.

This finding contrasts with the study of Du, Jiang, and Yuan (2025), which reported that higher levels of physical activity were associated with lower levels of stress and improved psychological functioning. Similarly, Huang et al. (2024) emphasized that regular engagement in physical activity contributes positively to emotional regulation and stress management.

However, the present findings may be explained by contextual factors such as academic workload, examination pressure, time constraints, and competing responsibilities, which may limit the influence of physical activity on stress reduction. AlHamlan et al. (2025) likewise explained that students experiencing high academic demands may have limited opportunities to engage consistently in physical activity despite its potential psychological benefits.

Overall, the findings indicate that physical activity alone was not significantly associated with academic stress among tertiary students. This highlights the importance of considering other academic and psychological factors when addressing stress management and student well-being within higher education institutions.

Significant Association Between Physical Activity and Mental Health Status

This section presents the association between physical activity and mental health status among tertiary students using Spearman Rho correlation analysis.

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Table 7. Spearman Rho Correlation Between Physical Activity and Mental Health Status Among Tertiary Students

Mental Health Dimension	Spearman rho	p-value (sig.)	Interpretation
MHC-SF			
Emotional Well-Being	0.103	0.074	Not Significant
Social Well-Being	0.101	0.081	Not Significant
Psychological Well-Being	0.188**	0.001	Significant
WHO-5			
Overall Well-Being	0.186**	0.001	Significant

Table 7 presents the correlation between physical activity and the different dimensions of mental health among tertiary students. The findings revealed varying degrees of association between physical activity and mental health dimensions.

In terms of emotional well-being, the computed correlation coefficient ($\rho = 0.103$) with a p-value of 0.074 indicates a weak positive association that is not statistically significant. Similarly, social well-being showed a weak positive association ($\rho = 0.101$, $p = 0.081$), which was likewise not significant. These findings suggest that physical activity was not significantly associated with the respondents' emotional and social well-being.

The findings may indicate that emotional and social well-being are influenced by multiple external factors such as interpersonal relationships, social support, and environmental conditions rather than physical activity alone. This supports the findings of Son et al. (2022) and Campoamor Olegario et al. (2025), who emphasized the importance of social and environmental factors in shaping emotional and social functioning among students.

In contrast, psychological well-being demonstrated a statistically significant positive association with physical activity ($\rho = 0.188$, $p = 0.001$). Although the correlation was weak, the results suggest that higher levels of physical activity were associated with improved psychological functioning, including self-acceptance, personal growth, and sense of purpose. This finding supports Reigal et al. (2021) and Liu et al. (2024), who reported that physical activity contributes positively to resilience, cognitive functioning, and psychological health.

Similarly, overall well-being as measured by the WHO-5 showed a statistically significant positive association with physical activity ($\rho = 0.186$, $p = 0.001$). The findings indicate that increased physical activity was associated with better overall well-being, including positive mood and life satisfaction. This finding is consistent with Du, Jiang, and Yuan (2025), who explained that regular physical activity contributes to improved mental health and emotional regulation.

Overall, the findings indicate that physical activity was significantly associated with psychological well-being and overall well-being, but not with emotional and social well-being. These results suggest that physical activity may contribute more strongly to internal psychological functioning and general well-being than to socially oriented dimensions of mental health.

The findings further highlight the importance of promoting physical activity within institutional wellness programs to support students' psychological functioning and overall well-being while recognizing the need for additional interventions that strengthen emotional support and social connectedness among tertiary students.

Significant Association Between Academic Stress and Mental Health Status

This section presents the association between academic stress and mental health status among tertiary students using Spearman Rho correlation analysis.

Table 8. Spearman Rho Correlation Between Academic Stress and Mental Health Status Among Tertiary Students

Mental Health Dimension	Spearman rho	p-value (sig.)	Interpretation
MHC-SF			
Emotional Well-Being	-0.358**	0.000	Significant
Social Well-Being	-0.315**	0.000	Significant
Psychological Well-Being	-0.334**	0.000	Significant
WHO-5			
Overall Well-Being	-0.423**	0.000	Significant

Table 8 presents the correlation between academic stress and the different dimensions of mental health among tertiary students. The findings revealed that academic stress was significantly and inversely associated with all dimensions of mental health. This indicates that higher levels of academic stress were associated with lower levels of emotional, social, psychological, and overall well-being.

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In terms of emotional well-being, the computed correlation coefficient ($p = -0.358$, $p = 0.000$) indicates a moderate negative association that is statistically significant. This suggests that increased academic stress was associated with lower levels of positive emotional functioning among the respondents. This finding supports Pérez-Jorge et al. (2025), who reported that excessive academic demands contribute to emotional exhaustion, anxiety, and reduced emotional stability among students.

Similarly, social well-being demonstrated a statistically significant negative association ($p = -0.315$, $p = 0.000$), indicating that higher levels of academic stress were associated with lower levels of social functioning and interpersonal engagement. This finding is consistent with Son et al. (2022), who emphasized that stress may negatively affect students' social relationships and sense of belonging.

Psychological well-being also showed a statistically significant inverse association with academic stress ($p = -0.334$, $p = 0.000$). The findings suggest that students experiencing elevated stress levels may have lower levels of self-acceptance, personal growth, and purpose in life. Olson et al. (2025) similarly found that prolonged academic stress contributes to burnout, cognitive fatigue, and reduced psychological functioning among university students.

The strongest association was observed in overall well-being as measured by the WHO-5 ($p = -0.423$, $p = 0.000$), indicating a moderate negative association between academic stress and general well-being. This suggests that higher academic stress was associated with lower levels of life satisfaction, positive mood, and overall psychological wellness. This finding supports Auerbach et al. (2023), who reported that elevated stress levels significantly increase the risk of poor mental health outcomes among tertiary students.

Overall, the findings demonstrate a consistent pattern in which increased academic stress was associated with poorer mental health outcomes across all measured dimensions. Therefore, the null hypothesis stating that there is no significant association between academic stress and mental health status among tertiary students was rejected.

The results highlight the importance of institutional wellness initiatives, stress-management programs, academic support systems, and mental health services that may help reduce academic stress and promote students' overall well-being within the higher education environment.

Mediation Analysis of Academic Stress Between Physical Activity and Emotional Well-Being

This section presents the mediation analysis examining whether academic stress significantly mediates the association between physical activity and emotional well-being among tertiary students using PROCESS Macro Model 4.

Table 9. Mediation Analysis of Academic Stress Between Physical Activity and Emotional Well-Being (MHC-SF)

Path	Predictor → Outcome	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
a	Physical Activity → Academic Stress	0.0000	0.0001	0.1738	0.8621	-0.0002	0.0002	Not Significant
b	Academic Stress → Emotional Well-Being	-0.0912	0.0115	-7.9539	0.0000	-0.1138	-0.0686	Significant
c'	Physical Activity → Emotional Well-Being	0.0000	0.0000	1.0286	0.3045	-0.0001	0.0000	Not Significant
Indirect	Physical Activity → Academic Stress → Emotional Well-Being	0.0000	0.0000	—	—	0.0000	0.0000	Not Significant

Table 9 presents the mediation analysis results between physical activity, academic stress, and emotional well-being. The findings revealed that academic stress did not significantly mediate the association between physical activity and emotional well-being among tertiary students.

Specifically, the association between physical activity and academic stress (Path a) was not statistically significant ($B = 0.0000$, $p = 0.8621$), indicating that physical activity was not significantly associated with changes in academic stress levels among the respondents. This finding is consistent with the earlier correlation analysis, which also showed no significant association between physical activity and academic stress.

In contrast, academic stress was significantly associated with emotional well-being (Path b: $B = -0.0912$, $p = 0.0000$). The negative coefficient indicates that higher levels of academic stress were associated with lower levels of emotional well-being among tertiary students. This finding supports Pérez-Jorge et al. (2025) and Olson et al. (2025), who emphasized that elevated academic stress negatively affects emotional functioning and psychological stability among students.

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Moreover, the direct association between physical activity and emotional well-being (Path c') was not statistically significant ($B = 0.0000$, $p = 0.3045$). Likewise, the indirect effect of physical activity on emotional well-being through academic stress was not significant, as the confidence interval included zero. These findings indicate the absence of a mediating effect.

The lack of mediation may be attributed to the absence of a significant association between physical activity and academic stress, which is an important condition in mediation analysis. Without a significant association between the predictor and the mediator, the indirect pathway becomes insufficient to establish mediation.

Overall, the findings indicate that academic stress was significantly associated with emotional well-being but did not function as a mediating variable between physical activity and emotional well-being among tertiary students. Therefore, the null hypothesis stating that academic stress does not significantly mediate the association between physical activity and emotional well-being among tertiary students was not rejected.

The findings further suggest that interventions intended to improve emotional well-being should directly address stress-management strategies and emotional support mechanisms rather than relying solely on physical activity as an indirect pathway toward emotional wellness.

Mediation Analysis of Academic Stress Between Physical Activity and Social Well-Being

This section presents the mediation analysis examining whether academic stress significantly mediates the association between physical activity and social well-being among tertiary students using PROCESS Macro Model 4.

Table 10. Mediation Analysis of Academic Stress Between Physical Activity and Social Well-Being (MHC-SF)

Path	Predictor → Outcome	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
a	Physical Activity → Academic Stress	0.0000	0.0001	0.1738	0.8621	-0.0002	0.0002	Not Significant
b	Academic Stress → Social Well-Being	-0.0783	0.0115	6.8214	0.0000	-0.1009	-0.0557	Significant
c'	Physical Activity → Social Well-Being	0.0000	0.0000	0.4521	0.6515	-0.0001	0.0000	Not Significant
Indirect	Physical Activity → Academic Stress → Social Well-Being	0.0000	0.0000	—	—	0.0000	0.0000	Not Significant

Table 10 presents the mediation analysis results between physical activity, academic stress, and social well-being. The findings revealed that academic stress did not significantly mediate the association between physical activity and social well-being among tertiary students.

Specifically, the association between physical activity and academic stress (Path a) was not statistically significant ($B = 0.0000$, $p = 0.8621$), indicating that physical activity was not significantly associated with academic stress levels among the respondents. This finding is consistent with the earlier correlation analysis showing no significant association between physical activity and academic stress.

In contrast, academic stress was significantly associated with social well-being (Path b: $B = -0.0783$, $p = 0.0000$). The negative coefficient indicates that higher levels of academic stress were associated with lower levels of social well-being among tertiary students. This finding supports Son et al. (2022), who emphasized that stress negatively affects interpersonal relationships, social connectedness, and students' sense of belonging.

Moreover, the direct association between physical activity and social well-being (Path c') was not statistically significant ($B = 0.0000$, $p = 0.6515$). Likewise, the indirect effect of physical activity on social well-being through academic stress was not significant, as the confidence interval included zero. These findings indicate the absence of a mediating effect.

The absence of mediation may be attributed to the non-significant association between physical activity and academic stress, which weakened the indirect pathway between physical activity and social well-being.

Overall, the findings indicate that academic stress was significantly associated with social well-being but did not function as a mediating variable between physical activity and social well-being among tertiary students. Therefore, the null hypothesis stating that academic stress does not significantly mediate the association between physical activity and social well-being among tertiary students was not rejected.

The findings further suggest that interventions intended to improve students' social well-being should focus on strengthening social support systems, stress-management strategies, and interpersonal engagement within the academic environment.

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Mediation Analysis of Academic Stress Between Physical Activity and Psychological Well-Being

This section presents the mediation analysis examining whether academic stress significantly mediates the association between physical activity and psychological well-being among tertiary students using PROCESS Macro Model 4.

Table 11. Mediation Analysis of Academic Stress Between Physical Activity and Psychological Well-Being (MHC-SF)

Path	Predictor → Outcome	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
a	Physical Activity → Academic Stress	0.0000	0.0001	0.1738	0.8621	-0.0002	0.0002	Not Significant
b	Academic Stress → Psychological Well-Being	-0.0810	0.0106	-7.6794	0.0000	-0.1018	-0.0603	Significant
c'	Physical Activity → Psychological Well-Being	0.0000	0.0000	2.4700	0.0141	0.0000	0.0001	Significant
Indirect	Physical Activity → Academic Stress → Psychological Well-Being	0.0000	0.0000	—	—	0.0000	0.0000	Not Significant

Table 11 presents the mediation analysis results between physical activity, academic stress, and psychological well-being. The findings revealed that academic stress did not significantly mediate the association between physical activity and psychological well-being among tertiary students, although a significant direct association between physical activity and psychological well-being was observed.

Specifically, the association between physical activity and academic stress (Path a) was not statistically significant ($B = 0.0000$, $p = 0.8621$), indicating that physical activity was not significantly associated with academic stress levels among the respondents. This finding is consistent with the earlier correlation analysis showing no significant association between physical activity and academic stress.

In contrast, academic stress was significantly associated with psychological well-being (Path b: $B = -0.0810$, $p = 0.0000$). The negative coefficient indicates that higher levels of academic stress were associated with lower levels of psychological well-being among tertiary students. This finding supports Olson et al. (2025), who reported that prolonged academic stress contributes to reduced motivation, cognitive fatigue, and diminished psychological functioning among students.

Notably, the direct association between physical activity and psychological well-being (Path c') was statistically significant ($B = 0.0000$, $p = 0.0141$). Although the coefficient value appears minimal due to scaling, the findings suggest that higher levels of physical activity were associated with better psychological well-being, including self-acceptance, personal growth, and purpose in life. This finding supports Reigal et al. (2021) and Liu et al. (2024), who emphasized the positive contribution of physical activity to resilience, cognitive functioning, and psychological health.

However, the indirect effect of physical activity on psychological well-being through academic stress was not statistically significant, as the confidence interval included zero. These findings indicate the absence of a mediating effect and suggest that the association between physical activity and psychological well-being occurred directly rather than through academic stress.

The absence of mediation may be attributed to the non-significant association between physical activity and academic stress, which weakened the indirect pathway between physical activity and psychological well-being.

Overall, the findings indicate that academic stress was significantly associated with psychological well-being, and that physical activity demonstrated a significant direct association with psychological well-being. However, academic stress did not function as a mediating variable between physical activity and psychological well-being among tertiary students. Therefore, the null hypothesis stating that academic stress does not significantly mediate the association between physical activity and psychological well-being among tertiary students was not rejected.

The findings further highlight the importance of promoting physical activity as a strategy for supporting psychological well-being while simultaneously addressing academic stress through institutional mental health and stress-management initiatives.

Mediation Analysis of Academic Stress Between Physical Activity and Overall Well-Being

This section presents the mediation analysis examining whether academic stress significantly mediates the association between physical activity and overall well-being among tertiary students using PROCESS Macro Model 4.

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Table 12. Mediation Analysis of Academic Stress Between Physical Activity and Overall Well-Being (WHO-5)

Path	Predictor → Outcome	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
a	Physical Activity → Academic Stress	0.0000	0.0001	0.1738	0.8621	-0.0002	0.0002	Not Significant
b	Academic Stress → Overall Well-Being	-0.4390	0.0438	10.0288	0.0000	-0.5252	-0.3529	Significant
c'	Physical Activity → Overall Well-Being	0.0001	0.0001	0.7341	0.4635	-0.0001	0.0002	Not Significant
Indirect	Physical Activity → Academic Stress → Overall Well-Being	0.0000	0.0000	—	—	-0.0001	0.0001	Not Significant

Table 12 presents the mediation analysis results between physical activity, academic stress, and overall well-being. The findings revealed that academic stress did not significantly mediate the association between physical activity and overall well-being among tertiary students.

Specifically, the association between physical activity and academic stress (Path a) was not statistically significant ($B = 0.0000$, $p = 0.8621$), indicating that physical activity was not significantly associated with academic stress levels among the respondents. This finding was consistent across all mediation models in the study and aligned with the earlier correlation analysis showing no significant association between physical activity and academic stress.

In contrast, academic stress was significantly associated with overall well-being (Path b: $B = -0.4390$, $p = 0.0000$). The negative coefficient indicates that higher levels of academic stress were associated with lower levels of general well-being, including positive mood, life satisfaction, and psychological wellness among tertiary students. This finding supports Auerbach et al. (2023), who emphasized that elevated stress levels are strongly associated with poorer mental health outcomes and increased psychological distress among university students.

However, the direct association between physical activity and overall well-being (Path c') was not statistically significant ($B = 0.0001$, $p = 0.4635$). Likewise, the indirect effect of physical activity on overall well-being through academic stress was not statistically significant, as the confidence interval included zero. These findings indicate the absence of a mediating effect.

The absence of mediation may be attributed to the non-significant association between physical activity and academic stress, which weakened the indirect pathway between physical activity and overall well-being.

Across the mediation analyses involving emotional well-being, social well-being, psychological well-being, and overall well-being, a consistent pattern was observed. Academic stress demonstrated significant negative associations with all dimensions of mental health, while physical activity did not demonstrate a significant association with academic stress. Consequently, the indirect effects across the mediation models remained non-significant.

Overall, the findings indicate that academic stress was significantly associated with mental health outcomes but did not function as a mediating variable between physical activity and mental health among tertiary students. Therefore, the null hypothesis stating that academic stress does not significantly mediate the association between physical activity and mental health among tertiary students was not rejected.

The findings further highlight the importance of directly addressing academic stress through institutional stress-management initiatives and mental health support services while promoting physical activity as a complementary strategy for enhancing selected aspects of student well-being.

Moderation Analysis of Physical Activity Between Academic Stress and Emotional Well-Being

This section examines whether physical activity significantly moderates the association between academic stress and emotional well-being among tertiary students using PROCESS Macro Model 1.

Table 13. Moderation Analysis of Physical Activity Between Academic Stress and Emotional Well-Being (MHC-SF)

Predictor	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
Constant	5.0436	0.3276	15.3956	0.0000	4.3989	5.6883	—
Academic Stress (X)	-0.0927	0.0153	-6.0444	0.0000	-0.1228	-0.0625	Significant negative predictor
Physical Activity (W)	0.0000	0.0001	-0.3518	0.7252	-0.0002	0.0001	Not Significant
Academic Stress × Physical Activity	0.0000	0.0000	0.1436	0.8859	0.0000	0.0000	No Moderation

Table 13.1. *Model Summary for the Moderation Analysis*

R	R ²	F	df1	df2	p-value
0.4225	0.1785	21.4340	3	296	0.0000

Table 13.2. *Interaction Test for Moderation*

Effect	ΔR^2	F	df1	df2	p-value
Academic Stress $\times$ Physical Activity	0.0001	0.0206	1	296	0.8859

Table 13 presents the moderation analysis of results between academic stress, physical activity, and emotional well-being. The findings revealed that academic stress was a statistically significant negative predictor of emotional well-being ($B = -0.0927$, $p = 0.0000$). The results indicate that higher levels of academic stress were associated with lower levels of emotional well-being among tertiary students. This finding supports Pérez-Jorge et al. (2025), who reported that excessive academic demands contribute to emotional strain and reduced emotional stability among students.

In contrast, physical activity was not significantly associated with emotional well-being in the model ($B = 0.0000$, $p = 0.7252$). More importantly, the interaction term between academic stress and physical activity was not statistically significant ($B = 0.0000$, $p = 0.8859$), indicating that physical activity did not significantly moderate the association between academic stress and emotional well-being.

This finding is further supported by Table 13.2, which shows that the change in explained variance attributed to the interaction term was negligible ($\Delta R^2 = 0.0001$, $p = 0.8859$). The results indicate that the inclusion of the interaction effect did not significantly improve the explanatory power of the model.

Despite the absence of a moderating effect, the overall regression model was statistically significant ($R^2 = 0.1785$, $p = 0.0000$), indicating that the variables included in the model collectively explained a meaningful proportion of the variance in emotional well-being. The findings suggest that academic stress remained significantly associated with emotional well-being regardless of the respondents' level of physical activity.

The absence of moderation may indicate that the negative association between academic stress and emotional well-being was not substantially weakened or strengthened by physical activity participation among tertiary students. Although previous studies such as Teuber et al. (2024) and Li and Huang (2025) identified physical activity as a potential protective factor for mental health, the present findings suggest that its buffering role may be limited within the context of academic stress and emotional well-being.

Overall, the findings indicate that physical activity did not significantly moderate the association between academic stress and emotional well-being among tertiary students. Therefore, the null hypothesis stating that physical activity does not significantly moderate the association between academic stress and emotional well-being among tertiary students was not rejected.

The findings further highlight the importance of directly addressing academic stress through stress-management interventions and institutional mental health support programs while promoting physical activity as a complementary wellness strategy for students.

Moderation Analysis of Physical Activity Between Academic Stress and Social Well-Being

This section examines whether physical activity significantly moderates the association between academic stress and social well-being among tertiary students using PROCESS Macro Model 1.

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Table 14. Moderation Analysis of Physical Activity Between Academic Stress and Social Well-Being (MHC-SF)

Predictor	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
Constant	4.3315	0.3278	13.2149	0.0000	3.6864	4.9765	—
Academic Stress (X)	-0.0826	0.0153	-5.3876	0.0000	-0.1128	-0.0524	Significant negative predictor
Physical Activity (W)	0.0000	0.0001	-0.5126	0.6086	-0.0002	0.0001	Not Significant
Academic Stress × Physical Activity	0.0000	0.0000	0.4289	0.6683	0.0000	0.0000	No Moderation

Table 14.1. Model Summary for the Moderation Analysis

R	R ²	F	df1	df2	p-value
0.3697	0.1367	15.6192	3	296	0.0000

Table 14.2. Interaction Test for Moderation

Effect	ΔR^2	F	df1	df2	p-value
Academic Stress × Physical Activity	0.0005	0.1839	1	296	0.6683

Table 14 presents the moderation analysis of results between academic stress, physical activity, and social well-being. The findings revealed that academic stress was a statistically significant negative predictor of social well-being ($B = -0.0826$, $p = 0.0000$). The results indicate that higher levels of academic stress were associated with lower levels of social well-being among tertiary students. This finding supports Pérez-Jorge et al. (2025), who emphasized that excessive academic demands may negatively affect students' interpersonal functioning and social relationships.

In contrast, physical activity was not significantly associated with social well-being in the model ($B = 0.0000$, $p = 0.6086$). More importantly, the interaction term between academic stress and physical activity was not statistically significant ($B = 0.0000$, $p = 0.6683$), indicating that physical activity did not significantly moderate the association between academic stress and social well-being.

This finding is further supported by Table 14.2, which shows that the change in explained variance attributed to the interaction term was minimal ($\Delta R^2 = 0.0005$, $p = 0.6683$). The results indicate that the inclusion of the interaction effect did not significantly improve the explanatory power of the model.

Despite the absence of a moderating effect, the overall regression model was statistically significant ($R^2 = 0.1367$, $p = 0.0000$), indicating that the variables included in the model collectively explained a meaningful proportion of the variance in social well-being. The findings suggest that academic stress remained significantly associated with social well-being regardless of the respondents' level of physical activity.

The absence of moderation may indicate that the negative association between academic stress and social well-being was not substantially weakened or strengthened by physical activity participation among tertiary students. Although previous studies such as Teuber et al. (2024) identified physical activity as beneficial to social interaction and well-being, the present findings suggest that its moderating role in the relationship between academic stress and social well-being was limited.

Overall, the findings indicate that physical activity did not significantly moderate the association between academic stress and social well-being among tertiary students. Therefore, the null hypothesis stating that physical activity does not significantly moderate the association between academic stress and social well-being among tertiary students was not rejected.

The findings further emphasize the importance of directly addressing academic stress through stress-management interventions, social support programs, and institutional wellness initiatives intended to strengthen students' social functioning and well-being.

Moderation Analysis of Physical Activity Between Academic Stress and Psychological Well-Being

This section examines whether physical activity significantly moderates the association between academic stress and psychological well-being among tertiary students using PROCESS Macro Model 1.

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Table 15. Moderation Analysis of Physical Activity Between Academic Stress and Psychological Well-Being (MHC-SF)

Predictor	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
Constant	4.7403	0.3015	15.7203	0.0000	4.1469	5.3338	—
Academic Stress (X)	-0.0804	0.0141	-5.7008	0.0000	-0.1082	-0.0527	Significant negative predictor
Physical Activity (W)	0.0000	0.0001	0.5708	0.5686	-0.0001	0.0002	Not Significant
Academic Stress × Physical Activity	0.0000	0.0000	-0.0648	0.9484	0.0000	0.0000	No Moderation

Table 15.1. Model Summary for the Moderation Analysis

R	R ²	F	df1	df2	p-value
0.4229	0.1789	21.4950	3	296	0.0000

Table 15.2. Interaction Test for Moderation

Effect	ΔR ²	F	df1	df2	p-value
Academic Stress × Physical Activity	0.0005	0.0042	1	296	0.9484

Table 15 presents the moderation analysis results between academic stress, physical activity, and psychological well-being. The findings revealed that academic stress was a statistically significant negative predictor of psychological well-being ($B = -0.0804$, $p = 0.0000$). The results indicate that higher levels of academic stress were associated with lower levels of psychological functioning among tertiary students. This finding supports Auerbach et al. (2023) and Olson et al. (2025), who reported that prolonged academic stress contributes to psychological distress, cognitive fatigue, and reduced psychological functioning among university students.

In contrast, physical activity was not significantly associated with psychological well-being in the model ($B = 0.0000$, $p = 0.5686$). More importantly, the interaction term between academic stress and physical activity was not statistically significant ($B = 0.0000$, $p = 0.9484$), indicating that physical activity did not significantly moderate the association between academic stress and psychological well-being.

This finding is further supported by Table 15.2, which shows that the change in explained variance attributed to the interaction term was negligible ($\Delta R^2 = 0.0000$, $p = 0.9484$). The results indicate that the inclusion of the interaction effect did not significantly improve the explanatory power of the model.

Despite the absence of a moderating effect, the overall regression model was statistically significant ($R^2 = 0.1789$, $p = 0.0000$), indicating that the variables included in the model collectively explained a meaningful proportion of the variance in psychological well-being. The findings suggest that academic stress remained significantly associated with psychological well-being regardless of the respondents' level of physical activity.

The absence of moderation may indicate that the negative association between academic stress and psychological well-being was not substantially weakened or strengthened by physical activity participation among tertiary students. Although previous studies such as Reigal et al. (2021) and Liu et al. (2024) identified physical activity as beneficial to resilience and psychological functioning, the present findings suggest that its moderating role in the relationship between academic stress and psychological well-being was limited.

Overall, the findings indicate that physical activity did not significantly moderate the association between academic stress and psychological well-being among tertiary students. Therefore, the null hypothesis stating that physical activity does not significantly moderate the association between academic stress and psychological well-being among tertiary students was not rejected.

The findings further emphasize the importance of directly addressing academic stress through stress-management interventions and institutional mental health programs while promoting physical activity as a complementary strategy for supporting students' psychological wellness.

Moderation Analysis of Physical Activity Between Academic Stress and Overall Well-Being

This section examines whether physical activity significantly moderates the association between academic stress and overall well-being among tertiary students using PROCESS Macro Model 1.

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Table 16. Moderation Analysis of Physical Activity Between Academic Stress and Overall Well-Being (WHO-5)

Predictor	Coefficient (B)	Std. Error	t	p-value	95% CI Lower	95% CI Upper	Interpretation
Constant	24.3383	1.2496	19.4763	0.0000	21.8790	26.7976	—
Academic Stress (X)	-0.4100	0.0585	-7.0115	0.0000	-0.5251	-0.2949	Significant negative predictor
Physical Activity (W)	0.0003	0.0003	0.8846	0.3771	-0.0004	0.0010	Not Significant
Academic Stress × Physical Activity	0.0000	0.0000	-0.7497	0.4540	0.0000	0.0000	No Moderation

Table 16.1. Model Summary for the Moderation Analysis

R	R ²	F	df1	df2	p-value
0.5051	0.2551	33.7968	3	296	0.0000

Table 16.2. Interaction Test for Moderation

Effect	ΔR^2	F	df1	df2	p-value
Academic Stress × Physical Activity	0.0014	0.5620	1	296	0.4540

Table 16 presents the moderation analysis of results between academic stress, physical activity, and overall well-being. The findings revealed that academic stress was a statistically significant negative predictor of overall well-being ($B = -0.4100$, $p = 0.0000$). The results indicate that higher levels of academic stress were associated with lower levels of general well-being, including positive mood, life satisfaction, and psychological wellness among tertiary students. This finding supports Pérez-Jorge et al. (2025) and Olson et al. (2025), who emphasized that prolonged academic stress contributes to emotional exhaustion, reduced life satisfaction, and poorer mental health outcomes among university students.

In contrast, physical activity was not significantly associated with overall well-being in the model ($B = 0.0003$, $p = 0.3771$). More importantly, the interaction term between academic stress and physical activity was not statistically significant ($B = 0.0000$, $p = 0.4540$), indicating that physical activity did not significantly moderate the association between academic stress and overall well-being.

This finding is further supported by Table 16.2, which shows that the change in explained variance attributed to the interaction term was minimal ($\Delta R^2 = 0.0014$, $p = 0.4540$). The results indicate that the inclusion of the interaction effect did not significantly improve the explanatory power of the model.

Despite the absence of a moderating effect, the overall regression model was statistically significant ($R^2 = 0.2551$, $p = 0.0000$), indicating that the variables included in the model collectively explained a meaningful proportion of the variance in overall well-being. The findings suggest that academic stress remained significantly associated with overall well-being regardless of the respondents' level of physical activity.

Across the dimensions of emotional well-being, social well-being, psychological well-being, and overall well-being examined in the moderation analyses, a consistent pattern was observed. Academic stress remained significantly associated with mental health outcomes, whereas physical activity did not demonstrate a significant moderating effect across the models. Although previous studies such as Teuber et al. (2024) and Li and Huang (2025) suggested that physical activity may help buffer stress-related outcomes, the present findings indicate that its moderating role was limited within the context of academic stress and mental health among tertiary students.

Overall, the findings indicate that physical activity did not significantly moderate the association between academic stress and mental health among tertiary students. Therefore, the null hypothesis stating that physical activity does not significantly moderate the association between academic stress and mental health among tertiary students was not rejected. The findings further emphasize the importance of directly addressing academic stress through institutional stress-management programs and mental health support services while promoting physical activity as a complementary strategy for supporting students' overall wellness and healthy lifestyle behaviors.

Proposed Wellness Program Components Based on the Findings

This section presents the proposed wellness of program components developed from the findings of the study. The proposed program aims to address the identified levels of physical activity, academic stress, and mental health among tertiary students through a structured and holistic wellness framework. The development of the program was anchored on the empirical

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findings, which revealed that academic stress was significantly associated with mental health outcomes, while physical activity served as a complementary factor supporting selected aspects of student well-being

I. Rationale of the Proposed Framework

Table 17. Proposed Wellness Program Matrix Based on the Findings

Program Component	Objectives	Key Activities	Target Outcome	Basis from Findings
Physical Activity (FITT-Based Program)	To increase students' level of physical activity and promote active lifestyles	Structured exercise sessions (3–5x/week), campus fitness programs, walking initiatives, intramurals	Improved physical activity levels and psychological well-being	Majority are moderately active (41%), but 24% are low; variability in duration and intensity
Academic Stress Management Modules	To reduce academic stress and improve coping mechanisms	Time management workshops, stress coping training, mindfulness sessions, academic coaching	Reduced perceived stress and improved mental health outcomes	85% of students fall under high to very high stress; stress significantly predicts all mental health domains
Sleep Hygiene Education	To improve sleep quality and duration among students	Seminars on sleep routines, digital detox campaigns, sleep tracking programs	Improved sleep patterns and emotional regulation	Majority sleep only 4–7 hours; linked to stress and mental health issues
Counseling and Mental Health Support	To provide psychological support and intervention for at-risk students	Counseling sessions, peer support groups, referral systems, mental health campaigns	Reduced psychological distress and improved well-being	13% languishing; high stress prevalence; variability in well-being
Social Engagement and Peer Support Programs	To strengthen social well-being and sense of belonging	Peer mentoring, group activities, student clubs, team-building programs	Improved social well-being and emotional support systems	Social well-being affected by stress; moderate mental health classification (52%)
Sedentary Behavior Reduction Initiatives	To decrease prolonged inactivity and promote movement	Active breaks in classes, movement campaigns, standing activities	Reduced sedentary time and improved overall health	Presence of low activity group (24%) and variability in MET levels

Table 17 presents the proposed wellness program matrix designed to promote student wellness and mental health within the tertiary academic environment.

The inclusion of a FITT-based physical activity program was supported by the findings showing that although most respondents demonstrated moderate physical activity levels, a considerable proportion remained under the low activity classification. The observed variability in frequency, duration, and intensity of physical activity further indicates the need for more structured and consistent wellness activities among students. The World Health Organization (2024) emphasized that regular engagement in physical activity contributes positively to physical and psychological well-being. Similarly, Du, Jiang, and Yuan (2025) reported that consistent participation in physical activity is associated with improved psychological functioning and overall wellness among students.

The inclusion of academic stress-management modules was strongly supported by the findings indicating that most respondents experienced high to very high levels of academic stress. Moreover, academic stress demonstrated significant negative associations with emotional, social, psychological, and overall well-being. These findings support Pérez-Jorge et al. (2025) and Olson et al. (2025), who emphasized that academic workload, examination pressure, and time demands contribute substantially to stress and psychological strain among university students. The findings suggest the importance of implementing stress-management activities such as time-management training, mindfulness practices, coping strategies, and academic support initiatives.

Sleep hygiene education was likewise included in the proposed program due to the observed sleep-related concerns among students. Adequate sleep is essential for emotional regulation, cognitive functioning, stress management, and overall

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mental wellness. Huang et al. (2024) emphasized that healthy lifestyle routines, including proper sleep practices, contribute positively to students' mental health and academic functioning.

Counseling and mental health support services were also incorporated into the proposed program due to the presence of respondents classified under languishing mental health status and the generally elevated stress levels among students. Auerbach et al. (2023) emphasized the importance of accessible counseling services, peer support systems, and mental health interventions within higher education institutions to support students experiencing emotional and psychological difficulties.

The inclusion of social engagement and peer support programs was supported by the findings indicating that academic stress was significantly associated with reduced social well-being. Son et al. (2022) explained that strong social support systems and positive peer relationships contribute significantly to emotional stability and student well-being. Thus, activities that encourage peer interaction, student involvement, and social connectedness may help strengthen students' social support networks within the academic environment.

Sedentary behavior reduction initiatives were likewise included due to the presence of respondents classified under low physical activity levels and the variability in overall energy expenditure. Previous studies such as Gao et al. (2023) and Yuniarti et al. (2024) emphasized that prolonged sedentary behavior is associated with increased risks of stress, anxiety, and poor mental health outcomes. Encouraging regular movement and active behaviors throughout the day may therefore contribute positively to students' overall wellness.

Overall, the proposed wellness program adopted a holistic and multi-component approach to student wellness by addressing both behavioral and psychological factors associated with mental health among tertiary students. The findings of the study highlight the importance of directly addressing academic stress while simultaneously promoting physical activity, healthy lifestyle behaviors, social support, and mental health services as complementary components of institutional wellness initiatives.

Based on the findings of this study, several conclusions drawn:

1. Tertiary students generally demonstrate a moderate level of physical activity, primarily through walking and other low- to moderate-intensity activities. However, variations in the frequency, intensity, and duration of participation indicate inconsistent engagement in physical activity among students.
2. Academic stress was highly prevalent among tertiary students, indicating that academic demands, time pressures, and performance expectations were associated with elevated levels of stress and psychological strain among students.
3. The mental health status of tertiary students was generally moderate, indicating functional but not optimal levels of emotional, social, psychological, and overall well-being. Although many students demonstrated positive mental health functioning, a portion of the respondents remained vulnerable to emotional and psychological difficulties.
4. Physical activity was not significantly associated with academic stress among tertiary students, suggesting that students perceived stress levels may be more strongly associated with academic and environmental demands than with physical activity participation alone.
5. Physical activity demonstrated significant positive associations with psychological well-being and overall well-being but was not significantly associated with emotional and social well-being. These findings suggest that physical activity may be more closely associated with internal psychological functioning and general wellness among tertiary students.
6. Academic stress demonstrates significant negative associations with emotional, social, psychological, and overall well-being. The findings indicate that increased academic stress was consistently associated with poorer mental health outcomes among tertiary students.
7. Academic stress did not significantly mediate the association between physical activity and mental health. The findings indicate that physical activity and academic stress operated independently in relation to mental health outcomes among tertiary students.
8. Physical activity did not significantly moderate the association between academic stress and mental health. The findings suggest that the association between academic stress and mental health remained consistent regardless of students' level of physical activity.
9. The findings support the importance of implementing a comprehensive and multi-component wellness program that prioritizes academic stress-management interventions while integrating physical activity initiatives, sleep hygiene education, counseling and mental health services, social support systems, and sedentary behavior reduction strategies to promote holistic student wellness.

Based on the findings of this study, several recommendations are proposed:

1. The university should prioritize the implementation of a comprehensive wellness program that integrates physical activity, stress management, mental health support, and healthy lifestyle interventions. Institutional policies should also be strengthened through structured wellness programs, adequate funding, and accessible student support services.

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2. Faculty members should adopt student-centered and flexible academic practices such as balanced workload distribution, reasonable deadlines, supportive instructional strategies, and wellness-oriented classroom activities to help reduce excessive academic stress among tertiary students.
3. Guidance offices should strengthen mental health services through regular counseling sessions, peer support programs, mental health awareness campaigns, and early intervention systems for students experiencing emotional and psychological difficulties.
4. Physical education instructors and sports coordinators should implement structured FITT-based physical activity programs that encourage regular participation in moderate-to-vigorous physical activities while promoting consistency, progression, and long-term engagement among students.
5. Student organizations should conduct social engagement and peer support activities such as mentoring programs, wellness events, team-building activities, and student support initiatives to strengthen students' social well-being and sense of belonging within the institution.
6. The health services unit should intensify sleep hygiene education and healthy lifestyle promotion through seminars, wellness campaigns, movement initiatives, and sedentary behavior reduction programs to support students' physical and mental well-being.
7. Developers of student wellness programs should adopt a multi-component intervention approach that prioritizes stress-management strategies while integrating physical activity, counseling services, social support systems, and healthy lifestyle practices as complementary wellness components.
8. Students should actively participate in wellness-related programs, engage in regular physical activity, practice effective stress-management strategies, maintain healthy lifestyle behaviors, and seek professional support when necessary to promote overall well-being.
9. Future researchers should explore additional variables such as coping strategies, resilience, social support, academic workload, and environmental factors that may be associated with physical activity, academic stress, and mental health among tertiary students. Future studies should also utilize longitudinal, mixed-method, or experimental research designs to further examine these associations across different educational settings.

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