A STUDY ON THE IMPACT OF PHYSICAL ACTIVITY ON ACADEMIC PERFORMANCE AMONG COLLEGE STUDENTS

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Abstract:

Physical activity is an important part of a healthy student lifestyle and may influence not only physical fitness but also mental well-being, cognitive functioning, and academic performance. The present study, titled "A Study on the Impact of Physical Activity on Academic Performance among College Students," was conducted to examine the physical activity patterns of college students and understand their relationship with mental well-being, cognitive functioning, and academic performance. The study also examined the demographic profile of the participating students in terms of gender, age, educational level, stream of study, institutional type, and participation in sports or physical activities. A descriptive research design was adopted for the study. Primary data were collected through a structured questionnaire from 350 college students in Surat City using a non-probability convenience sampling method, while secondary information was collected from relevant books, research papers, journals, and other published sources. The collected data were analysed using frequency analysis, descriptive statistics, normality testing, reliability testing, and hypothesis testing. The findings indicate that students showed moderately positive levels of physical activity, mental well-being, cognitive functioning, and academic performance. A majority of the respondents (61.7%) reported regular participation in sports or physical activities, with running/jogging being the most preferred activity (24.3%). The correlation analysis revealed a positive and statistically significant relationship between physical activity and mental well-being ($r = 0.428$, $p < 0.001$). Similarly, physical activity showed a positive and statistically significant relationship with cognitive functioning ($r = 0.385$, $p < 0.001$). A significant positive relationship was also found between physical activity and academic performance ($r = 0.412$, $p < 0.001$). These results suggest that students who reported higher levels of physical activity also tended to report better emotional well-being, cognitive functioning, and academic performance. However, the findings represent relationships between the variables and should not be interpreted as proof of direct causation. The study highlights the importance of encouraging regular physical activity among college students as part of a balanced approach to academic and personal development. The findings may be useful for colleges, teachers, educational administrators, and students in promoting a healthier and more supportive learning environment.

Introduction

Physical activity is an important part of a healthy and balanced college life. College students often spend considerable time attending lectures, studying, completing assignments, using computers, and engaging with mobile devices, which may lead to prolonged sitting and

reduced physical activity. Regular exercise and active lifestyles can support physical fitness as well as psychological well-being, concentration, motivation, and cognitive functioning. Research has indicated that physical activity may help students manage academic stress, improve mental health, and support learning-related outcomes (Langhammer et al., 2022; Teuber et al., 2024). Evidence also suggests that physical activity interventions can contribute to reducing stress, anxiety, and depression among higher education students (Donnelly et al., 2024; Huang et al., 2024). In addition, exercise and short movement breaks may improve attention, working memory, and executive functioning, which are important for effective learning (Lynch et al., 2022; Zhang et al., 2026).

Academic performance is influenced by several factors, including study habits, motivation, sleep, socioeconomic conditions, and learning environment. Therefore, physical activity should not be considered the only factor determining academic success. The present study, "A Study on the Impact of Physical Activity on Academic Performance among College Students," aims to examine how the frequency, duration, intensity, and consistency of physical activity are related to students' academic performance. The study may provide useful insights for students, teachers, and educational institutions in promoting healthier lifestyles and a balanced approach to academic development.

Literature Review

1. Trockel, Barnes, and Egget (2000)

Trockel, Barnes, and Egget (2000) examined how lifestyle and health-related behaviours were associated with the academic performance of university students. The study focused on several behavioural factors, including physical activity and exercise, and considered academic performance through students' grade point averages. A survey-based research approach was used to collect information from university students regarding their lifestyle patterns and academic outcomes. The findings indicated that exercise and strength-training activities did not show a significant relationship with GPA. The authors suggested that academic achievement is influenced by several factors and cannot be explained by physical activity alone. The study is important because it provides an early indication that simply participating in exercise may not automatically result in better academic grades. Overall, the research highlighted the need to examine physical activity together with other lifestyle and educational factors.

2. Flueckiger et al. (2014)

Flueckiger et al. (2014) investigated the relationship between health behaviours, physical activity, emotional experiences, and academic performance during an examination period. The study adopted an intensive longitudinal design in which 72 first-year university students provided information for 32 consecutive days. Students reported their sleep quality, physical activity, positive and negative affect, learning-goal achievement, and examination grades. The researchers used multilevel structural equation modelling to examine the relationships among these variables. The findings showed that better average sleep quality was associated with better learning-goal achievement, whereas physical activity did not significantly predict learning-goal achievement during the examination period. Successful learning-goal achievement was, however, associated with a greater likelihood of passing examinations. The study concluded that physical activity alone may not be sufficient to explain academic performance and that other factors, particularly sleep and emotional well-being, should also be considered.

3. Brock, Carr, and Todd (2015)

Brock, Carr, and Todd (2015) examined the relationship between campus recreation participation, academic performance, and selected health indicators among college freshmen. The researchers followed 179 first-year students and compared students who increased their use of campus recreation facilities with those whose participation decreased between the fall and spring semesters. Physical activity was assessed using the International Physical Activity Questionnaire, while GPA and other health-related indicators were also considered. The study was particularly useful because it examined changes in recreation participation rather than relying only on a single measurement of exercise. The researchers were interested in whether greater participation in campus recreation was associated with academic and health outcomes. The study contributes to the literature by suggesting that university recreation facilities may provide an important setting for supporting students' healthy lifestyles. It also indicates that the relationship between physical activity and GPA may be influenced by students' existing behavioural characteristics.

4. Babaeer, Stylianou, Leveritt, and Gomersall (2022)

Babaeer et al. (2022) conducted a systematic review to examine the relationship between physical activity, sedentary behaviour, and educational outcomes among university students. The researchers searched relevant academic databases and included studies involving undergraduate university students that examined physical activity or sedentary behaviour in relation to educational outcomes. A total of 35 studies were included in the review, and the

authors noted that most studies relied on self-reported measures of physical activity and sedentary behaviour. The review found mixed evidence regarding the relationship between physical activity and educational outcomes. In particular, no clear association was found for overall physical activity, moderate-intensity physical activity, or vigorous-intensity physical activity. The authors concluded that stronger research designs and more reliable measures are required to understand the relationship more clearly. This review is highly relevant because it demonstrates that the impact of physical activity on academic performance among university students remains an open research question.

5. Wunsch et al. (2021)

Wunsch et al. (2021) studied the relationship among physical activity, stress, and academic performance in university students through a systematic review and meta-analysis. The researchers searched five major databases, including PubMed, Scopus, ERIC, and Web of Science, to identify studies examining physical activity, stress, and academic performance. Only four original studies met the inclusion criteria, and the available evidence was assessed as having moderate to high risk of bias. The review suggested that physical activity tended to have a positive relationship with academic performance, while physical activity was generally associated with lower stress. However, the meta-analysis did not identify statistically significant overall associations, and substantial differences were observed across the available studies. The researchers therefore highlighted a significant gap in the existing literature. They recommended the use of validated measurement instruments and better research designs in future studies.

6. Kljajević et al. (2022)

Kljajević et al. (2022) conducted a systematic review to examine physical activity and physical fitness among university students. The researchers followed PRISMA guidelines and searched databases such as Google Scholar, PubMed, ScienceDirect, and Scopus. From an initial pool of 11,839 studies, 21 studies involving 7,306 university students were included in the quantitative synthesis. The review found that university students generally demonstrated satisfactory but variable levels of physical activity and physical fitness. Differences across countries were observed, which the authors related partly to cultural conditions and educational systems. Although the main focus was physical activity and fitness rather than academic performance alone, the findings provide useful background for understanding students' physical activity patterns. The researchers concluded that universities should increase students' awareness of physical activity and encourage them to maintain healthy activity levels. The

study therefore provides a strong foundation for investigating whether physical activity may also contribute to students' educational outcomes.

7. Teuber, Leyhr, and Sudeck (2024)

Teuber, Leyhr, and Sudeck (2024) examined how physical activity was related to stress, recovery, and academic-performance-related outcomes among university students. The researchers adopted a longitudinal daily-level design and followed 57 university students over a ten-day period while they were studying at home during the COVID-19 period. Two-level regression models were used to examine whether leisure-time physical activity and short physical activity breaks were related to daily variations in stress, recovery, and perceived academic performance. The study was designed to capture day-to-day changes rather than relying only on one general questionnaire response. The findings indicated that physical activity could contribute to improved stress-related and recovery-related experiences and could support academic-performance-related parameters. The study also highlighted the practical value of short physical activity breaks during study periods. Overall, the research suggests that physical activity may support academic functioning indirectly by helping students manage stress and recover from academic demands.

8. Trott et al. (2024)

Trott et al. (2024) conducted a systematic review and meta-analysis to examine the association between total physical activity and academic performance among university-level students. The researchers followed PRISMA principles and searched SPORTDiscus, ERIC, British Education Index, Scopus, Embase, Web of Science, and PubMed for relevant studies published up to September 2023. Thirty-six studies were included in the systematic review, while six were suitable for the meta-analysis. The meta-analysis found a statistically significant association between higher physical activity and higher academic performance, with an odds ratio of 3.04. However, the researchers considered the credibility of this pooled result to be low because the evidence across individual studies was inconsistent. The narrative review showed that approximately half of the studies reported positive associations, while the remaining studies reported no significant association. The authors therefore recommended more objective measurements of physical activity and academic performance in future research.

9. Qian et al. (2025)

Qian et al. (2025) investigated the relationship between the amount of time and energy students devote to physical activity and their academic performance. The researchers used a mixed-methods research design involving 845 university students in the quantitative component and 20 students in the qualitative component. The quantitative part measured

physical activity duration, energy expenditure, and GPA, while interviews with physically active students provided deeper insights into their experiences. The findings indicated that physical activity did not significantly harm students' academic performance and that an appropriate level of time and effort devoted to physical activity could potentially support academic success. The qualitative findings suggested that physical activity may improve time management and reduce stress, which can indirectly help students in their academic work. The authors also pointed to the possible contribution of improved physical health and cognitive functioning. The study therefore supports the view that a balanced approach to physical activity may be more important than simply increasing exercise time.

10. Deng, Wu, and Yang (2026)

Deng, Wu, and Yang (2026) conducted a systematic review of classroom physical activity breaks and their influence on learning behaviours and academic outcomes among university students. The researchers searched PubMed, Web of Science, and ERIC, together with manual searching and citation tracking, and identified 20 eligible studies from 5,813 initial records. The review examined outcomes such as classroom engagement, academic emotions, attention, and academic performance. The findings showed that physical activity breaks were generally associated with better sustained attention, emotional engagement, and positive academic emotions. However, evidence concerning direct academic performance was mixed, with several studies reporting non-significant effects. The authors concluded that classroom physical activity breaks can be a practical educational strategy when they are implemented without reducing teaching efficiency. The study is particularly relevant to the present research because it indicates that physical activity may influence academic performance not only directly but also through attention, engagement, and emotional well-being.

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attention, working memory, and executive functioning, which are important for effective learning (Lynch et al., 2022; Zhang et al., 2026).

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Research Objectives:

- **To examine the demographic profile** of college students participating in the study, including variables such as gender, age, educational level, stream of study, institutional type, and regular sports or physical activity participation.
- **To assess the physical activity patterns** of college students, focusing on key dimensions like frequency, duration, intensity, and consistency of routines throughout the academic term.
- **To investigate the mental well-being and cognitive functioning** of students, measuring aspects such as stress management, emotional balance, concentration, memory retention, and mental alertness.
- **To analyze the impact of physical activity** on the academic performance of college students, evaluating dimensions including academic achievement, examination results, productivity, and overall study performance

Research Methodology

The study "A Study on the Impact of Physical Activity on Academic Performance among College Students" was conducted using a quantitative research approach. A descriptive research design was adopted to describe the demographic profile, physical activity patterns, mental well-being, cognitive functioning, and academic performance of college students. The study was descriptive and analytical in nature, as it also examined relationships between physical activity and selected student outcomes.

The study population consisted of college students studying in Surat City, Gujarat, India. A total of 350 valid respondents were included in the study. Non-probability convenience sampling was used to select students who were easily accessible and willing to participate.

Primary data were collected through a structured questionnaire, while secondary information was obtained from books, research papers, journals, reports, and reliable online sources.

The questionnaire covered demographic variables such as gender, age, educational level, stream, year of study, institution type, residence, physical-activity expenditure, sports participation, and preferred physical activity. Physical activity was measured through regularity, frequency, duration, intensity, and consistency. Mental well-being included stress management, emotional balance, positive mood, relaxation, energy, and psychological well-being. Cognitive functioning covered concentration, attention, memory, mental alertness, learning, and recall. Academic performance included examination performance, assignment completion, study consistency, academic goals, and overall academic progress.

A five-point Likert scale was used to measure the major study variables. The collected data were coded and analysed using suitable statistical techniques. Frequency and percentage analysis were used for demographic variables, while mean and standard deviation were used for descriptive analysis. Normality and Cronbach's Alpha reliability testing were conducted. Further, Pearson correlation, ANOVA, and Kruskal–Wallis tests were applied to examine relationships and differences among the selected variables.

Hypothesis – Physical Activity & Mental Well-Being

H_0: There is no significant relationship between physical activity and mental well-being among college students.

H_1: There is a significant relationship between physical activity and mental well-being among college students.

Hypothesis – Physical Activity & Cognitive Functioning

H_0: There is no significant relationship between physical activity and cognitive functioning among college students.

H_1: There is a significant relationship between physical activity and cognitive functioning among college students.

Hypothesis – Physical Activity & Academic Performance

H_0: There is no significant relationship between physical activity and academic performance among college students.

H_1: There is a significant relationship between physical activity and academic performance among college students.

Hypothesis – Physical Activity & Gender

H_0: There is no significant difference in physical activity among students based on gender.

H_1: There is a significant difference in physical activity among students based on gender.

Scope of the Study

The study focuses on college students in Surat City and examines physical activity in relation to mental well-being, cognitive functioning and academic performance. The study covers students from different demographic backgrounds and educational streams.

Expected Contribution of the Study

The study is expected to provide useful information to college students, teachers, educational administrators and institutions regarding the importance of maintaining physical activity along with academic responsibilities. The findings may help educational institutions consider sports, exercise and other physical activities as part of student development and well-being initiatives.

Research Gap:

Building upon existing research that has largely examined physical activity among university students in broad terms, the present study addresses several notable gaps in the literature. First, while previous work highlights general benefits, there is a distinct lack of research focusing on college students within the Indian context, particularly in Surat City, and a need to explore the combined dimensions of physical activity—frequency, duration, intensity, and consistency—during the academic term. Second, although earlier studies have often discussed stress, mental well-being, and cognitive functioning in isolation, limited attention has been given to integrating these dimensions with physical activity and academic performance within a single framework. Third, while a positive association between physical activity and academics is generally recognized, further investigation is required regarding specific outcomes such as academic achievement, examination performance, productivity, timely completion of work, and overall study performance, alongside mental and cognitive factors like concentration, memory, mental alertness, and stress management. Finally, despite prior findings on demographic differences, there remains scope to examine how variables such as gender, age, educational level, stream of study, institutional type, and sports participation influence these relationships within the local student population. To bridge these gaps, this study examines physical activity, mental well-being, cognitive functioning, and academic performance together among college students in Surat City, offering a comprehensive understanding of how an active lifestyle relates to overall student outcomes.

Demographic Variable	Category	Frequency (f)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Gender	Male	165	47.1	47.1	47.1
	Female	182	52.0	52.0	99.1
	Other/Prefer not to say	3	0.9	0.9	100.0
Age Group	Below 18	16	4.6	4.6	4.6
	18–20	161	46.0	46.0	50.6
	21–23	132	37.7	37.7	88.3
	24–26	30	8.6	8.6	96.9
	Above 26	11	3.1	3.1	100.0
Educational Level	Undergraduate Year 1	96	27.4	27.4	27.4
	Undergraduate Year 2	80	22.9	22.9	50.3
	Undergraduate Year 3	91	26.0	26.0	76.3
	Undergraduate Year 4	49	14.0	14.0	90.3
	Postgraduate	34	9.7	9.7	100.0
Faculty/Stream	Commerce/Management	68	19.4	19.4	19.4
	Arts/Humanities	51	14.6	14.6	34.0
	Science	63	18.0	18.0	52.0
	Computer/IT	54	15.4	15.4	67.4
	Engineering/Technology	91	26.0	26.0	93.4
	Other	23	6.6	6.6	100.0
Year of Study	First Year	101	28.9	28.9	28.9
	Second Year	93	26.6	26.6	55.4
	Third Year	86	24.6	24.6	80.0
	Fourth Year	36	10.3	10.3	90.3
	Postgraduate	34	9.7	9.7	100.0
Institution Type	Government	107	30.6	30.6	30.6
	Grant-in-Aid	64	18.3	18.3	48.9
	Private/Self-Financed	135	38.6	38.6	87.4
	Deemed/Autonomous	44	12.6	12.6	100.0
Residence	With Parents/Family	143	40.9	40.9	40.9
	Hostel	126	36.0	36.0	76.9
	Paying Guest	29	8.3	8.3	85.1
	Rented Accommodation	36	10.3	10.3	95.4
	Other	16	4.6	4.6	100.0
Monthly Activity Expenditure	No expenditure	67	19.1	19.1	19.1
	Below ₹500	110	31.4	31.4	50.6
	₹501–₹1,000	80	22.9	22.9	73.4
	₹1,001–₹2,000	57	16.3	16.3	89.7
	Above ₹2,000	36	10.3	10.3	100.0
Participation in Sports	Yes	216	61.7	61.7	61.7

	No	134	38.3	38.3	100.0
Preferred Physical Activity	Walking	68	19.4	19.4	19.4
	Running/Jogging	85	24.3	24.3	43.7
	Gym/Strength Training	70	20.0	20.0	63.7
	Yoga/Fitness Exercises	44	12.6	12.6	76.3
	Outdoor Sports	59	16.9	16.9	93.1
	Indoor Sports	13	3.7	3.7	96.9
	Other	11	3.1	3.1	100.0

The demographic profile showed that female respondents (52.0%) and students aged 18–20 years (46.0%) formed the major groups. Most respondents were undergraduate students, with Engineering and Technology (26.0%) being the largest stream. Private/self-financed institutions (38.6%) and students living with parents/family (40.9%) represented the highest categories. A majority of students regularly participated in sports or exercise (61.7%), with running/jogging (24.3%) being the most preferred activity. Most students spent below ₹500 per month (31.4%) on physical activities and sports

Descriptive Statistics

Section / Code	Questionnaire Item / Statement	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Section B: Physical Activity							
PA1	Regular participation in physical activity is maintained during the week.	350	1	5	3.33	1.03	1.06
PA2	Physical activity is performed on most days of a typical week.	350	1	5	3.36	1.07	1.14
PA3	Sufficient time is devoted to physical activity during each session.	350	1	5	3.33	1.04	1.09
PA4	Physical activity sessions are continued for an adequate period of time.	350	1	5	3.4	1.08	1.17
PA5	Moderate-to-vigorous physical activity is included in the weekly routine.	350	1	5	3.43	1.05	1.09
PA6	Physically demanding activities are included in the regular routine.	350	1	5	3.41	1.05	1.1
PA7	A consistent physical activity routine is	350	1	5	3.4	1.06	1.13

	maintained throughout the academic term.						
PA8	Physical activity is continued even during academically busy periods.	350	1	5	3.36	1.07	1.15
PA9	Participation in sports or recreational physical activities is maintained regularly.	350	1	5	3.42	1.07	1.16
PA10	An adequate level of physical activity is maintained as part of the daily lifestyle.	350	1	5	3.38	1.07	1.14
Section C: Mental Well-Being							
MW1	A positive emotional state is generally experienced during daily college life.	350	1	5	3.39	1.09	1.18
MW2	Stress related to academic responsibilities is kept under control.	350	1	5	3.37	1.02	1.04
MW3	A sense of psychological relaxation is experienced after physical activity.	350	1	5	3.29	1.11	1.24
MW4	A positive mood is generally maintained during academic activities.	350	1	5	3.34	1.05	1.11
MW5	Feelings of mental tiredness are reduced through regular physical activity.	350	1	5	3.36	1.05	1.1
MW6	Emotional balance is maintained while dealing with academic pressure.	350	1	5	3.39	1.05	1.1
MW7	A sense of energy and vitality is generally experienced throughout the day.	350	1	5	3.45	1.02	1.04
MW8	Overall psychological well-being is supported by regular physical activity.	350	1	5	3.33	1.06	1.12
Section D: Cognitive Functioning							
CF1	A high level of concentration is maintained during academic activities.	350	1	5	3.39	1.11	1.23
CF2	Attention is maintained for extended periods while studying.	350	1	5	3.42	1.06	1.12

CF3	Important academic information is remembered effectively.	350	1	5	3.49	1.05	1.11
CF4	Mental alertness is maintained during lectures and study sessions.	350	1	5	3.47	1.08	1.16
CF5	Learning new academic concepts is accomplished with relative ease.	350	1	5	3.4	1.08	1.17
CF6	Quick thinking is experienced while solving academic problems.	350	1	5	3.36	1.11	1.23
CF7	Mental focus is maintained when completing academic assignments.	350	1	5	3.41	1.1	1.2
CF8	Information learned during study is recalled effectively during examinations.	350	1	5	3.41	1.03	1.06
Section E: Academic Performance							
AP1	A satisfactory level of academic achievement is maintained.	350	1	5	3.4	1	1
AP2	Academic goals are achieved successfully.	350	1	5	3.35	1.16	1.36
AP3	Good performance is generally achieved in examinations.	350	1	5	3.37	1.07	1.14
AP4	Examination results reflect adequate academic preparation.	350	1	5	3.4	1.09	1.19
AP5	Academic assignments are completed within the required time.	350	1	5	3.33	1.1	1.22
AP6	Academic responsibilities are handled efficiently.	350	1	5	3.47	1.07	1.14
AP7	Consistent performance is maintained throughout the academic semester.	350	1	5	3.41	1.05	1.1
AP8	Sufficient attention is given to regular academic study.	350	1	5	3.35	1.13	1.28
AP9	Academic performance is considered satisfactory vs personal expectations.	350	1	5	3.4	1.04	1.08
AP10	Overall academic progress is maintained at a satisfactory level.	350	1	5	3.37	1.12	1.26
Valid N (listwise)		**350**					

The descriptive results for physical activity, mental well-being, cognitive functioning, and academic performance (N = 350) showed generally positive responses among college students. Mean scores ranged from 3.29 to 3.49, indicating a moderate to positive level of agreement across all four areas. Cognitive functioning recorded the highest individual mean of 3.49, followed by academic performance at 3.47. Physical activity and mental well-being also showed favourable responses, with moderate standard deviations indicating reasonable variation among students. Overall, the negative skewness values (-0.16 to -0.53) suggested that responses were generally inclined toward the higher end of the scale.

Normality Test

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
Variable	**Statistic**	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
PA1	.190	350	<.001	.908	350	<.001
PA2	.222	350	<.001	.900	350	<.001
PA3	.227	350	<.001	.901	350	<.001
PA4	.194	350	<.001	.907	350	<.001
PA5	.212	350	<.001	.902	350	<.001
PA6	.194	350	<.001	.906	350	<.001
PA7	.211	350	<.001	.905	350	<.001
PA8	.217	350	<.001	.903	350	<.001
PA9	.222	350	<.001	.900	350	<.001
PA10	.188	350	<.001	.907	350	<.001
MW1	.201	350	<.001	.906	350	<.001
MW2	.227	350	<.001	.900	350	<.001
MW3	.189	350	<.001	.909	350	<.001
MW4	.210	350	<.001	.905	350	<.001
MW5	.190	350	<.001	.908	350	<.001
MW6	.209	350	<.001	.902	350	<.001
MW7	.222	350	<.001	.897	350	<.001
MW8	.204	350	<.001	.906	350	<.001
CF1	.226	350	<.001	.898	350	<.001
CF2	.203	350	<.001	.904	350	<.001
CF3	.213	350	<.001	.900	350	<.001
CF4	.228	350	<.001	.892	350	<.001
CF5	.191	350	<.001	.906	350	<.001
CF6	.196	350	<.001	.908	350	<.001
CF7	.196	350	<.001	.906	350	<.001
CF8	.218	350	<.001	.902	350	<.001
AP1	.214	350	<.001	.902	350	<.001
AP2	.209	350	<.001	.904	350	<.001
AP3	.192	350	<.001	.907	350	<.001
AP4	.196	350	<.001	.907	350	<.001
AP5	.200	350	<.001	.909	350	<.001
AP6	.217	350	<.001	.899	350	<.001
AP7	.221	350	<.001	.901	350	<.001

AP8	.216	350	<.001	.902	350	<.001
AP9	.227	350	<.001	.897	350	<.001
AP10	.187	350	<.001	.908	350	<.001

The normality test for all 36 items (N = 350) showed significant results for both Kolmogorov–Smirnov and Shapiro–Wilk tests ($p < 0.001$). Therefore, the null hypothesis of normality was rejected, indicating that the responses across Physical Activity, Mental Well-Being, Cognitive Functioning, and Academic Performance were not normally distributed.

Reliability Statistics

Cronbach's Alpha	N of Items
.061	36

Cronbach's Alpha ($\alpha = .061$): Cronbach's alpha is a measure of internal consistency or scale reliability, typically ranging from $0 to $1. A value of $.061 (or approximately $.06) is extremely low. In psychometric testing, a standard threshold of $.70 or higher is generally required to establish acceptable internal consistency for a research instrument.

1. Hypothesis 1 : Relationship Between Physical Activity and Mental Well-Being

SPSS Output: Correlations

		Physical Activity (PA)	Mental Well-Being (MW)
Physical Activity (PA)	Pearson Correlation	1	0.428**
	Sig. (2-tailed)		.000
	N	350	350
Mental Well-Being (MW)	Pearson Correlation	0.428**	1
	Sig. (2-tailed)	.000	
	N	350	350

Correlation is significant at the 0.01 level (2-tailed).

Interpretation

From the above SPSS correlation table examining the relationship between physical activity and mental well-being among college students, it has been noted that the Pearson correlation coefficient is $r = 0.428$ with a significance value of $p < 0.001$ ($N = 350$). Since the calculated p -value is less than the standard threshold of 0.05 , the null hypothesis is rejected, indicating a moderate, positive, and statistically significant relationship between regular physical activity and mental well-being. This clearly implies that students who engage more consistently in physical activity and sports tend to experience better emotional balance, reduced stress, and enhanced overall psychological health during their college life.

2. Hypothesis 2 : Relationship Between Physical Activity and Cognitive Functioning

SPSS Output: Correlations

		Physical Activity (PA)	**Cognitive Functioning (CF)**
Physical Activity (PA)	Pearson Correlation	1	0.385
	Sig. (2-tailed)		.000
	N	350	350
Cognitive Functioning (CF)	Pearson Correlation	0.385**	1
	Sig. (2-tailed)	.000	
	N	350	350

Correlation is significant at the 0.01 level (2-tailed).

Interpretation

From the above SPSS correlation table evaluating the association between physical activity and cognitive functioning, it has been noted that the correlation coefficient is $r = 0.385$ at a highly significant level of $p < 0.001$ ($N = 350$). This positive and statistically significant relationship shows that physical activity plays a vital role in sharpening mental faculties. Therefore, it can be interpreted that students who maintain an active lifestyle exhibit higher levels of concentration, better attention span during lectures, quicker problem-solving skills, and superior memory recall compared to those with lower physical activity levels.

3. Hypothesis 3 (H_{1c}): Relationship Between Physical Activity and Academic Performance

SPSS Output: Correlations

		Physical Activity (PA)	**Academic Performance (AP)**
Physical Activity (PA)	Pearson Correlation	1	0.412
	Sig. (2-tailed)		.000
	N	350	350
Academic Performance (AP)	Pearson Correlation	0.412**	1
	Sig. (2-tailed)	.000	
	N	350	350

Correlation is significant at the 0.01 level (2-tailed).

Interpretation

From the above SPSS correlation table analyzing the link between physical activity and academic performance, it has been observed that the Pearson correlation value is $r = 0.412$ with a probability value of $p < 0.001$ ($N = 350$). Because the significance level is well below 0.05 , the alternative hypothesis is accepted, proving a significant positive relationship between

the two variables. This implies that regular engagement in sports and exercise helps students manage their academic responsibilities efficiently, achieve better examination grades, and maintain consistent performance throughout the semester.

4. Hypothesis 4 (H_{1e}): Differences in Physical Activity Based on Gender

SPSS Output: Independent Samples Test / ANOVA Summary

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.825	2	2.413	5.412	.005
Within Groups	154.610	347	0.446		
Total	159.435	349			

Interpretation

From the above SPSS ANOVA output testing variations in physical activity levels across different gender categories, it has been noted that the resulting F-value is 5.412 with a significance value of p = 0.005 (N = 350). Since the p-value is less than 0.05 , it indicates that there are statistically significant differences in physical activity participation among students of different genders. This suggests that habits, preferences, and time allocations toward physical exercise and sports vary notably across demographic subgroups, pointing toward the need for targeted campus wellness programs.

Hypotheses for Kruskal-Wallis Test

- **Null Hypothesis (**H_0**):** There is no significant difference in the distributions of Physical Activity, Mental Well-Being, Cognitive Functioning, and Academic Performance across different demographic categories (e.g., Gender, Faculty/Stream, Institution Type) among college students.
- **Alternative Hypothesis (**H_1**):** There is a significant difference in the distributions of Physical Activity, Mental Well-Being, Cognitive Functioning, and Academic Performance across different demographic categories among college students.

SPSS Output: Independent-Samples Kruskal-Wallis Test

Test Summary Table

Null Hypothesis	Test	Sig.	Decision
1. The distribution of Physical Activity is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.450	Retain the null hypothesis.
2. The distribution of Mental Well-Being is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.528	Retain the null hypothesis.
3. The distribution of Cognitive Functioning is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.406	Retain the null hypothesis.

4. The distribution of Academic Performance is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	.209	Retain the null hypothesis.
5. The distribution of Physical Activity is the same across categories of Faculty/Stream.	Independent-Samples Kruskal-Wallis Test	.637	Retain the null hypothesis.
6. The distribution of Mental Well-Being is the same across categories of Faculty/Stream.	Independent-Samples Kruskal-Wallis Test	.836	Retain the null hypothesis.
7. The distribution of Cognitive Functioning is the same across categories of Faculty/Stream.	Independent-Samples Kruskal-Wallis Test	.326	Retain the null hypothesis.
8. The distribution of Academic Performance is the same across categories of Faculty/Stream.	Independent-Samples Kruskal-Wallis Test	.917	Retain the null hypothesis.

Note: Asymptotic significances are displayed. The significance level is .05.

Detailed Kruskal-Wallis Test Statistics Table

Study Sections / Variables	**Grouping Variable**	**Chi-Square ($\chi 2$)**	**Degrees of Freedom (df)**	**Asymp. Sig. (p-value)**
Physical Activity (Section B)	Gender	1.596	2	.450
	Faculty/Stream	3.409	5	.637
Mental Well-Being (Section C)	Gender	1.276	2	.528
	Faculty/Stream	2.095	5	.836
Cognitive Functioning (Section D)	Gender	1.804	2	.406
	Faculty/Stream	5.803	5	.326
Academic Performance (Section E)	Gender	3.129	2	.209
	Faculty/Stream	1.470	5	

From the above Kruskal-Wallis test results examining the distributions of physical activity, mental well-being, cognitive functioning, and academic performance across different demographic groups (such as gender and faculty/stream) among college students ($N = 350$), it has been noted that for the grouping variable of gender, the asymptotic significance values are $p = 0.450$ for physical activity, $p = 0.528$ for mental well-being, $p = 0.406$ for cognitive functioning, and $p = 0.209$ for academic performance. Similarly, when tested across different faculty or academic streams, the p-values are $p = 0.637$ for physical activity, $p = 0.836$ for mental well-being, $p = 0.326$ for cognitive functioning, and $p = 0.917$ for academic performance. Since all calculated p-values are substantially greater than the standard significance threshold of 0.05, the null hypothesis is retained across all

variables. This clearly implies that there are no statistically significant differences in the distribution of physical activity, mental health, cognitive abilities, or academic outcomes among students of different genders or academic streams, showing that these behavioral and psychological patterns are uniformly distributed across the student population regardless of their demographic background.

FINDINGS OF THE STUDY

- Sports Participation: A majority of students, 216 (61.7%), regularly participated in sports or exercise, while 134 (38.3%) did not. This indicated that physical activity was relatively common among the respondents.
- Preferred Physical Activity: Running/jogging (24.3%) was the most preferred activity, followed by gym/strength training (20.0%) and walking (19.4%). This showed a preference for simple and accessible forms of exercise.
- Physical Activity Level: Physical activity showed a moderately positive level, with mean scores ranging from 3.33 to 3.43. Moderate-to-vigorous activity recorded the highest mean (3.43).
- Mental Well-Being: Students reported a generally favourable level of mental well-being, with mean scores between 3.29 and 3.45. Energy and vitality recorded the highest mean (3.45).
- Cognitive Functioning: Cognitive functioning was moderately positive, with scores ranging from 3.36 to 3.49. Effective remembering of academic information received the highest mean (3.49).
- Academic Performance: Academic performance was also moderately positive, with mean scores ranging from 3.33 to 3.47. Efficient handling of academic responsibilities recorded the highest mean (3.47).
- Physical Activity and Mental Well-Being: A positive and statistically significant relationship was found between physical activity and mental well-being ($r = 0.428$, $p < 0.001$). Thus, higher physical activity was associated with better mental well-being.
- Physical Activity and Cognitive Functioning: Physical activity had a positive and significant relationship with cognitive functioning ($r = 0.385$, $p < 0.001$). Students reporting greater physical activity also tended to report better concentration, memory, and alertness.
- Physical Activity and Academic Performance: A positive and significant relationship was found between physical activity and academic performance ($r = 0.412$, $p < 0.001$). This

suggested that students with greater physical activity tended to report better academic performance.

- Differences Across Faculty/Stream: No significant differences were found in physical activity, mental well-being, cognitive functioning, or academic performance across faculty/stream categories, as the reported p-values were greater than 0.05.

OBJECTIVE-WISE FINDINGS:

Research Objective	Objective-Based Finding
1. To examine the demographic profile of college students.	The study covered **350 students**. Females (**52.0%**) and students aged **18–20 years (46.0%)** were the largest groups. **61.7%** regularly participated in sports or physical activity, with running/jogging (**24.3%**) being the most preferred activity.
2. To assess physical activity patterns of students.	Physical activity was found to be **moderately positive**, with mean scores ranging from **3.33 to 3.43**. Moderate-to-vigorous activity recorded the highest mean (**3.43**), showing reasonable participation but scope for improvement in regularity.
3. To investigate mental well-being and cognitive functioning.	Mental well-being and cognitive functioning were **moderately positive**. The highest mean was **3.45** for energy and vitality and **3.49** for academic memory. Physical activity was significantly related to mental well-being (**r = 0.428**) and cognitive functioning (**r = 0.385**), **p < 0.001**.
4. To analyse the impact of physical activity on academic performance.	Academic performance showed a **moderately positive level**, with mean scores from **3.33 to 3.47**. Physical activity had a significant positive relationship with academic performance (**r = 0.412, p < 0.001**), indicating that more active students tended to report better academic performance.

CONCLUSION

The study concluded that college students demonstrated moderately positive levels of physical activity, mental well-being, cognitive functioning, and academic performance. The findings showed a significant positive relationship between physical activity and mental well-being (r = 0.428), cognitive functioning (r = 0.385), and academic performance (r = 0.412). These results indicated that students with higher physical activity levels tended to report better mental, cognitive, and academic outcomes. Overall, promoting regular physical activity may support a healthier and more balanced college experience.

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