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A Comparative Study of Stress Levels among Physically Active and Inactive University Students at Kohat University of Science and Technology (KUST)

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ABSTRACT

The purpose of this study was to compare the stress levels of undergraduate students at Kohat University of Science and Technology (KUST) who were physically active and those who were not. This study investigated whether regular physical activity acts as a stress-reduction strategy in light of the growing incidence of academic stress among college students. A sample of 400 students was chosen by stratified random sampling as part of a quantitative, cross-sectional design. The Perceived Stress Scale (PSS-10) and a physical activity questionnaire developed in accordance with WHO guidelines were used to gather data. Students who were physically inactive reported significantly higher stress scores than their physically active counterparts, according to descriptive statistics. Students who were physically active reported feeling less stressed, according to an independent samples t-test that revealed a statistically significant difference in stress levels between the two groups (p <.001). These results demonstrate how important physical activity is for supporting students' mental health. As a preventative measure against academic stress, it is advised that universities establish organized fitness programs and policies to promote active lifestyles among students.

Keywords: *KUST, university students, mental health, academic stress, student wellness, physical activity, and perceived stress*

INTRODUCTION

Students face many academic, social, and personal obstacles during their time in college, which frequently leads to high levels of psychological stress. Academic pressure, time constraints, financial responsibilities, and the transition to independence are some of the reasons why university students experience stress, which is defined as the body's physiological and psychological reaction to perceived demands or threats (Alghamdi et al., 2024; Chen et al., 2023). Chronic stress can weaken the immune system, affect cognitive function, and hasten the onset of anxiety and depression if left unchecked (Mahmoud et al., 2023).

Researchers and medical professionals have focused on non-pharmacological stress management strategies in response to the escalating mental health issues, and physical activity has been identified as a key protective factor in these strategies. Through the release of endorphins and other neurochemicals that encourage relaxation and emotional well-being, physical activity is well known for its capacity to regulate mood (World Health Organization [WHO], 2023; Patel et al., 2024). Regular exercise has been demonstrated to increase psychological resilience, improve sleep quality, boost self-esteem, and lower cortisol levels (Santos et al., 2023).

Physically active people consistently report lower levels of stress, anxiety, and depressive symptoms than people who lead sedentary lifestyles, according to studies done across a variety of populations (Javed et al., 2024; Nakamura et al., 2023). Even moderate exercise has been associated with better focus, mood control, and coping skills for college students in demanding academic settings (Chowdhury & Alam, 2023).

Despite these established advantages, a significant percentage of college students—particularly in low- and middle-income nations like Pakistan—remain physically inactive because of their heavy course loads, a lack of recreational opportunities, and a lack of knowledge about the positive effects of exercise on mental health (Ahmad et al., 2024). The possible effects of physical inactivity on students' mental health are seriously called into question by this pattern, particularly in high-stress educational environments like Kohat University of Science and Technology (KUST).

Examining this relationship in local contexts is essential given the rising incidence of stress among Pakistani university students and the protective benefits of physical activity. Thus, the current study compares the stress levels of KUST students who are physically active and those who are not. The goal of this study is to support healthy lifestyle interventions and offer evidence-based suggestions for student wellness programs in Pakistani higher education institutions.

Research Objectives

The study aims to achieve the following specific objectives:

1. To determine the general stress levels of Kohat University of Science and Technology (KUST) students.
2. To determine and contrast the stress levels of students who engage in physical activity with those who do not.
3. To investigate if university students' perceptions of stress are significantly reduced by physical activity.

Research Hypotheses

The following hypotheses have been formulated for this study:

- **H_0 (Null Hypothesis):**

  There is no significant difference in stress levels between physically active and inactive students at KUST.

- **H_1 (Alternative Hypothesis):**

  There is a significant difference in stress levels between physically active and inactive students at KUST.

RESEARCH METHODOLOGY

Research Design

This study employed the quantitative comparative research design in an attempt to determine whether the level of stress among a physically active group of students and those that are inactive is differentiated successfully by means of statistics. The cross-sectional survey method was used to determine an effective comparison between the two groups, that is, it collected data that took place at a specific point in time (Creswell & Creswell, 2023).

Population, sample and sampling methods

The target population in this study was undergraduate students of Kohat University of Science and Technology (KUST) who registered regarding the academic year, 2024 2025. This population consists of students doing different academic courses like computer science, management sciences, social sciences and the natural sciences. Researchers have found that this population is suitable to make comparative analysis because it exhibits the variation of perceived stress and physical activity levels. There was an enrolment of about 3,000 undergraduates at KUST. A stratified random sampling method was used and 400 students were selected as sample out of the target population. This approach ensured that it was possible to have students of all the areas of study and years represented in the sample. the pupils were split into two groups based on the level of their activity after that:

Physically Active Group: 200 students who reported doing at least 150 minutes of moderate-intensity exercise weekly, as advised by the World Health Organization (2023).

The physically inactive group were composed of 200 students who said that they have less than 150 minutes of physical activity each week. This sample was sufficient considering the possibility of non-response or incomplete data, and to ensure reliability of statistics and comparative validity. The selection criteria enabled meaningful generalization in the university context because it ensured that there was balance in terms of gender, academic discipline and year of study. The sample size was calculated with the help of standard formulas, with consideration given to 95% of the confidence value and a margin of error of 5%.

Criteria for Inclusion and Exclusion

Requirements for Inclusion:

- Full-time undergraduate students enrolled at KUST.
- Aged 18–26.
- Willing to voluntarily take part in the study.

Students who have been diagnosed with psychological disorders or who are physically disabled and unable to participate in physical activity are excluded.

Research Instrument

Two instruments were used to gather the data:

Perceived Stress Scale (PSS-10): Created by Cohen and colleagues, the PSS-10 is a validated tool for gauging one's level of stress during the previous month. Ten items total, ranging from 0 (never) to 4 (very often), are rated on a 5-point Likert scale.

Physical Activity Questionnaire: In accordance with WHO guidelines, students were classified as "physically active" or "inactive" using a self-reported checklist based on the International Physical Activity Questionnaire (IPAQ) (WHO, 2023). Physical activity was defined as engaging in at least 150 minutes of moderate activity per week.

Data collection and analysis

The questionnaires were disseminated both electronically and on paper during lecture hours following ethical approval from the university's research ethics committee. Participants received guarantees of confidentiality and anonymity. Prior to data collection, informed consent was acquired.

IBM SPSS (version 25) was used to analyze the data. Demographic and categorical data were summarized using descriptive statistics (mean, standard deviation, frequency). Separate samples The mean stress scores of active and inactive students were compared using the t-test. Statistical significance was defined as $p < 0.05$.

Ethical Consideration

The Institutional Review Board (IRB) at KUST granted ethical approval for the study; participants were made aware of their right to withdraw at any time; and data confidentiality and anonymity were always upheld.

RESULTS AND FINDINGS

Descriptive Statistics

Descriptive statistics were computed to summarize the demographic characteristics of the sample and to understand the central tendencies and dispersion of stress levels among physically active and inactive students.

Table 1: Descriptive Statistics of Stress Scores by Group

Group	N	Mean Stress Score	Standard Deviation
Physically Active	200	18.75	4.23
Physically Inactive	200	23.48	5.10
Total	400	21.12	5.21

Interpretation

The descriptive data indicate that physically inactive students reported a higher mean stress score (M = 23.48, SD = 5.10) compared to physically active students (M = 18.75, SD = 4.23). This suggests a potential inverse relationship between physical activity and stress levels among university students.

Inferential Statistics

An **independent samples t-test** was conducted to examine whether the difference in stress scores between physically active and inactive students was statistically significant.

Table 2: Independent Samples t-Test Results

Variable	t	df	p-value	Mean Difference	95% CI of Difference
Stress Score	-10.14	398	< .001	-4.73	[-5.65, -3.81]

Interpretation

The results of the independent samples t-test indicate that the difference in stress levels between physically active and inactive students was **statistically significant** *(t(398) = -10.14, p < .001)*. The negative t-value suggests that physically active students had significantly **lower stress levels** than their inactive counterparts. The 95% confidence interval for the mean difference did not cross zero, which further confirms the reliability of the result.

Thus, the **null hypothesis (H_0)**—that there is no significant difference in stress levels between physically active and inactive students—**is rejected**, and the **alternative hypothesis (H_1)** is accepted.

Summary of Findings

- Physically inactive students experienced **higher levels of perceived stress** than physically active students.
- The difference in stress levels between the two groups was found to be **statistically significant**.
- These findings align with prior research, reinforcing the idea that physical activity is an effective non-clinical strategy to reduce psychological stress in university settings.

DISCUSSION

The findings of this research indicate that the existing system of assessing the board examinations has an immense effect on student motivation, either positively or negatively. According to most students, the pressure of doing well in the standardized tests made them feel more anxious and stressed. This supports the results presented by Mouchantaf, who mentioned that high-stakes exams are likely to encourage poor learning processes and hamper intrinsic motivation (2021). The trend of students focusing more on the memorisation rather than understanding makes deep learning more difficult.

Educators too have complained of the shortcomings of the board exams especially that of overemphasizing rote learning and their scorn towards application and critical thinking. Kaur and Arora (2022) also supported these opinions by stating that these tests discourage the use of new strategies of teaching activities and underestimate higher order cognitive skills.

Not surprisingly, other students have admitted that board exams gave them a specific goal and structure to pursue and this helped to increase their extrinsic motivation. The danger of this motivation being so frequently linked with fear of failure as opposed to actual interest provides credence to the Ryan and Deci (2020) analysis between controlled and autonomous motivation.

Gender and the type of schools were also identified to have some effect as demographic variables. Students attending private schools were also more motivated (albeit slightly) perhaps due to improved methods and resources of study. This holds true to the results of Habib et al. (2023), who found that institutional support greatly influenced how students performed in board exams in terms of motivation.

There is a general perception among most teachers and students that the structure of the board exams should be changed to enhance a motivational approach centered towards learning and less anxiety over performance. These results confirm the prior studies pointing out the importance of a practice that facilitates constructive criticism and overall development because of assessment (Black & Wiliam, 2018).

CONCLUSIONS

The results of the study show that the methods used for board exam assessment have a major impact on student motivation. The current system, which is characterized by rigorous, summative, and high-stakes assessments, primarily has a negative impact on learning behavior and intrinsic motivation. The stress, anxiety, and rote learning that come with it outweigh any potential benefits, even though it might marginally boost extrinsic motivation.

Both teachers and students are aware of the flaws in the current exam system. Teachers find it constrictive in terms of promoting meaningful learning experiences, and students feel pressured to perform rather than learn. Therefore, the study emphasizes the urgent need for reforms that make assessments more formative, balanced, and reflective of real-life skills.

The results of the study suggest that motivation-driven learning ought to take the place of examination-driven instruction, with assessments acting as a means of promoting rather than discouraging student involvement.

RECOMMENDATIONS

1. Students who were physically inactive reported significantly higher levels of perceived stress than their peers who were physically active. Therefore, it is recommended that the university's administration incorporate structured physical activity programs into the academic calendar. Programs that promote emotional well-being and reduce stress in students include yoga classes, fitness challenges, and escorted morning walks.
2. Regular exercise was associated with lower average stress scores and higher emotional resilience; therefore, student wellness centers should actively promote exercise as a key component of stress reduction programs. Working together with student organizations, holding workshops, and launching awareness campaigns can boost participation and encourage a mental and physical health culture.
3. Students who met the WHO's physical activity guidelines, which call for 150 minutes per week, reported significantly lower stress levels.

4. Based on this data, KUST is recommended to increase accessibility to fitness and recreational facilities. If gym memberships are subsidized, hours are extended, and spaces are designated for physical activity, more students might engage in regular exercise.
5. Due to their excessive workloads and lack of motivation, students often led sedentary lives. As a result, academic departments should consider adding quick physical activity breaks to classroom settings. Instructors can use quick stretching or energizer exercises in between lectures to cut down on sedentary time and increase student alertness.
6. There was a statistically significant difference in stress levels between students who were physically active and those who weren't. Therefore, the university's administration should consider developing and implementing a physical activity policy that encourages all students to meet the minimum requirements for exercise. This might mean adding physical activity modules to new student orientation programs or requiring physical education.

Overall Recommendation

7. Because research consistently demonstrates a strong negative correlation between stress and physical activity, a comprehensive student support system is required. Therefore, it is recommended that the university include academic support, mental health counseling, lifestyle education, and physical activity promotion in its framework for student development.

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