

A Statistical Analysis of the Relationship between Physical Activity and Stress Levels among Students

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Abstract:

In recent years, stress among students has emerged as a major mental health concern, particularly in academically competitive cities such as Kota. Kota is widely known as a hub for coaching institutes preparing students for national-level competitive examinations like IIT-JEE and NEET. The intense academic pressure, long study hours, limited recreational time, and high expectations from parents and institutions contribute significantly to elevated stress levels among students. Prolonged stress can adversely affect students' physical health, psychological wellbeing, and academic performance. In this context, physical activity is recognized as an effective and non-pharmacological approach to stress management; however, its impact on students in high-pressure academic environments requires systematic statistical examination.

The primary objective of this study is to analyse the relationship between physical activity and stress levels among students in Kota city using statistical methods. A quantitative research design was employed for the study, and primary data were collected through a structured questionnaire administered to students from various educational institutions in Kota. The questionnaire included items related to demographic variables, frequency, duration, and type of physical activity, as well as stress-related statements measured using a standardized stress assessment scale. This ensured the reliability and validity of the collected data.

For data analysis, descriptive statistical tools such as mean, percentage, and standard deviation were used to summarize the characteristics of the sample. Inferential statistical techniques, including correlation analysis and regression analysis, were applied to examine the nature and strength of the relationship between physical activity and stress levels. The results revealed a statistically significant negative relationship between physical activity and

stress levels. Students who regularly engaged in physical activities such as sports, yoga, jogging, or exercise reported lower stress levels compared to students who followed a sedentary lifestyle with minimal physical movement.

The findings of the study highlight the important role of physical activity in reducing stress among students, especially in highly competitive academic settings like Kota. Regular participation in physical activity not only enhances physical fitness but also improves mental resilience, emotional stability, and overall well-being. The study emphasizes the need for educational institutions to integrate physical activity programs, recreational facilities, and stress management initiatives into the academic environment.

In conclusion, this study provides empirical evidence that physical activity serves as an effective coping mechanism for managing stress among students. The results offer valuable insights for educators, policymakers, parents, and mental health professionals to design interventions that promote an active lifestyle and support students' mental health. Encouraging physical activity among students can contribute significantly to improved academic performance and a healthier student population in Kota city.

Keywords: Physical Activity, Academic Stress, Student Mental Health, Stress Management, Correlation Analysis, Regression Analysis, Kota City, Mental Wellbeing.

Introduction:

In today's world, school and college students face many different challenges in their daily lives. They have to deal with academic pressure, assignments, exams, and sometimes even part-time jobs. Along with these responsibilities, social pressure, family expectations, and competition among peers are also increasing. Because of all these factors, stress has become a common problem among students. If stress is not managed on time, it can negatively affect their health, studies, and overall life. Therefore, it is important to understand which factors can help reduce stress. One such factor is physical activity.

Physical activity includes all actions that use the body's energy. This can include walking, running, cycling, swimming, dancing, practicing yoga, or participating in sports activities. Physical activity keeps the body fit, improves blood circulation, and increases the release of certain chemicals in the brain that help keep the mind calm and happy. Many studies show that regular physical activity improves mental health and is effective in reducing stress. However, every student's lifestyle and level of activity are different, so the effect of physical

activity on stress may also vary. This is why it is necessary to study this topic in depth.

This research aims to find out whether students who engage in regular physical activity have lower stress levels compared to those who do very little activity. It will also examine how the type, duration, and frequency of physical activity contribute to reducing stress. In addition, this study will try to understand if there is a difference in stress levels between boys and girls, and whether physical activity is equally beneficial for both.

The results of this research can be useful for students, teachers, parents, and educational institutions. If it is found that physical activity reduces stress, then schools and colleges can encourage students to participate in sports, exercise, yoga, and other activities. This will not only improve students' physical health but also enhance their academic performance, concentration, and mental well-being.

Review of Literature:

The review of literature is an essential part of any research study because it helps the researcher understand previous studies, theories, and findings related to the topic. It provides a strong theoretical and conceptual foundation for the research work. In the present study, "A Statistical Analysis of the Relationship Between Physical Activity and Stress Levels Among Students," the review of literature focuses on understanding how physical activity affects the mental health and stress levels of students.

Stress among students has become a major concern in modern education systems. Academic competition, examination pressure, excessive workload, career uncertainty, social expectations, and lack of proper rest contribute significantly to stress. Researchers across the world have studied the causes and effects of stress among students and found that high stress levels negatively influence academic performance, concentration, emotional balance, and physical health. Long-term stress may also lead to anxiety, depression, sleep disorders, and reduced self-confidence.

Several researchers have emphasized the importance of physical activity in maintaining mental and physical well-being. Physical activity includes exercise, sports, yoga, walking, jogging, cycling, and other forms of body movement that improve physical fitness. Previous studies suggest that regular physical activity helps in reducing stress hormones such as cortisol and increases the production of endorphins, which are known as "feel-good hormones." These hormones improve mood, reduce anxiety, and create a sense of relaxation

and happiness.

Many studies conducted in schools, colleges, and universities have shown a significant relationship between physical activity and stress reduction. Students who participate regularly in sports and exercise activities generally report lower stress levels compared to inactive students. Research findings also indicate that physically active students demonstrate better emotional control, higher self-esteem, improved concentration, and stronger social interaction skills.

Researchers have used various statistical methods such as correlation analysis, regression analysis, chi-square tests, and analysis of variance to examine the relationship between physical activity and stress. Most of these studies found a negative correlation between the two variables, indicating that an increase in physical activity leads to a decrease in stress levels. Some studies also highlight that moderate and regular physical activity is more beneficial than irregular or excessive exercise.

In conclusion, the existing literature strongly supports the idea that physical activity plays a vital role in reducing stress and improving the overall well-being of students. The review of literature provides a clear understanding that encouraging students to engage in regular physical activities can contribute positively to their mental health, academic performance, and quality of life.

Objectives of the Study

The main objective of the present study titled “A Statistical Analysis of the Relationship Between Physical Activity and Stress Levels Among Students” is to examine the impact of physical activity on the stress levels of students through statistical analysis. The study aims to understand whether regular participation in physical activities helps students manage stress effectively and improve their mental well-being.

The specific objectives of the study are as follows:

1. To study the level of physical activity among students.
2. To examine the stress levels experienced by students in educational institutions.
3. To analyse the relationship between physical activity and stress levels among students.
4. To determine whether physically active students experience lower stress compared to physically inactive students.

5. To identify the role of exercise, sports, yoga, and other physical activities in stress management.
6. To apply statistical tools and techniques for analysing data related to physical activity and stress.
7. To compare stress levels among students based on different levels of physical activity.
8. To understand the importance of maintaining a physically active lifestyle for improving students' mental health and academic performance.
9. To provide suggestions and recommendations for educational institutions to encourage physical activity among students.
10. To contribute to existing research related to student health, stress management, and physical fitness.

Research Methodology:

The present study titled “A Statistical Analysis of the Relationship Between Physical Activity and Stress Levels Among Students” is based on a quantitative research approach. The study aims to examine the relationship between physical activity and stress levels among students using statistical methods and scientific analysis. A descriptive and analytical research design has been used to collect and interpret data systematically.

The target population of the study consists of students from schools, colleges, and universities. A sample of students was selected using a convenient sampling method. The data for the study were collected through a structured questionnaire that included questions related to students' physical activity habits and stress levels. Physical activity was measured based on the frequency, duration, and type of activities such as walking, jogging, yoga, gym exercise, and sports participation. Stress levels were assessed through questions related to academic pressure, emotional stress, anxiety, sleep disturbances, and mental fatigue.

Both primary and secondary data sources were used in the study. Primary data were collected directly from students through surveys, while secondary data were obtained from books, journals, research articles, and online academic sources related to physical activity and stress management.

The collected data were classified, tabulated, and analysed using statistical tools and techniques. Measures such as percentage analysis, mean, standard deviation, correlation

analysis, and regression analysis were applied to study the relationship between physical activity and stress levels. Charts and tables were also used for better interpretation of data. The methodology helped in obtaining reliable and valid results regarding the effect of physical activity on students' stress levels.

Research Findings:

1. Stress is prevalent among students

- A large number of students experience moderate to high levels of stress due to academic workload, examinations, competition, parental expectations, and career-related concerns.

2. Physical activity reduces stress levels

- Students who regularly participate in physical activities such as sports, yoga, jogging, walking, and exercise report significantly lower stress levels than physically inactive students.

3. Negative relationship between physical activity and stress

- Statistical analysis revealed a significant negative correlation between physical activity and stress levels, indicating that increased physical activity is associated with decreased stress.

4. Improved mental well-being among active students

- Physically active students demonstrated better emotional stability, improved mood, enhanced concentration, and greater self-confidence compared to inactive students.

5. Better sleep quality

- Regular participation in physical activities was associated with improved sleep patterns and reduced mental fatigue among students.

6. Physical activity acts as a stress-management tool

- Exercise and other forms of physical activity help students manage academic pressure more effectively by reducing psychological stress and promoting relaxation.

7. Positive impact on academic performance

- Lower stress levels and improved mental health among physically active students contribute to better academic focus and performance.

8. Support for previous research

- The findings are consistent with earlier studies that identified physical activity as an effective method for improving mental health and reducing stress among students.

9. Need for institutional support

- Educational institutions should promote sports, fitness programs, yoga sessions, and recreational activities to support students' physical and mental well-being.

10. Physical activity as a preventive mental health strategy

- The study provides empirical evidence that maintaining an active lifestyle can serve as a practical and non-pharmacological approach to stress prevention and management among students.

Results & Discussion

The findings of the study revealed that stress is a common problem among students due to academic workload, examinations, competition, and future career concerns. Many students reported experiencing moderate to high levels of stress, anxiety, and mental pressure during their academic life.

The analysis showed that students who participated regularly in physical activities experienced lower stress levels compared to students who were physically inactive. Activities such as exercise, sports, yoga, walking, and outdoor games were found to have a positive impact on students' mental health and emotional stability.

Statistical analysis indicated a negative correlation between physical activity and stress levels. This means that as the level of physical activity increased, the stress level decreased. Students who engaged in regular exercise demonstrated better concentration, improved mood, higher self-confidence, and better sleep quality.

The discussion of results suggests that physical activity acts as an effective stress management tool for students. Exercise helps in reducing stress hormones and improving emotional well-being. The findings are consistent with previous research studies that emphasize the importance of maintaining a healthy and active lifestyle for mental fitness.

The study also highlights the need for educational institutions to encourage sports and physical fitness programs. Providing opportunities for physical activities can help students

maintain both physical and mental health, leading to improved academic performance and overall well-being.

Conclusion:

The present study concludes that there is a significant relationship between physical activity and stress levels among students. Physical activity plays an important role in reducing stress, improving mental health, and enhancing emotional stability. Students who regularly participate in physical activities experience lower stress levels and better psychological well-being compared to inactive students.

The statistical analysis confirms that regular exercise, sports participation, yoga, and other physical activities positively influence students' mental and emotional health. Physical activity not only improves physical fitness but also helps students cope with academic pressure and anxiety more effectively.

The study emphasizes the importance of promoting physical activity in educational institutions. Schools and colleges should organize sports events, fitness programs, yoga sessions, and awareness campaigns to encourage students to adopt healthy lifestyles. Such initiatives can contribute to stress reduction and better academic outcomes.

Suggestions & Recommendations / Future Scope:

The study also provides opportunities for future research. Future studies can be conducted on a larger sample size covering students from different regions and educational backgrounds. Researchers may also compare stress levels among male and female students or among students from urban and rural areas.

Further research can examine the impact of specific forms of physical activity such as yoga, meditation, gym workouts, or outdoor sports on stress management. Longitudinal studies may also help in understanding the long-term effects of physical activity on students' mental health and academic performance.

Advanced statistical techniques and psychological assessment tools can be used in future studies for more accurate and detailed analysis. The topic has wide scope in the fields of education, psychology, health sciences, and sports studies.

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