



THE EFFECTS OF REGULAR EXERCISE ON MENTAL HEALTH AND DEVELOPMENT OF KPK UNIVERSITY STUDENTS

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Abstract

Background: Mental disorders represent a major public health concern, affecting a significant proportion of the global population and contributing to substantial healthcare costs and disability. Physical activity has been recognized as a critical factor in promoting mental and physical well-being. University students are particularly vulnerable to stress and mental health challenges, and their physical activity patterns can influence both mental health outcomes and overall life satisfaction.

Objective: This study aimed to examine the relationship between regular physical activity, sedentary behavior, and indicators of mental health, quality of life, and life satisfaction among university students.

Methods: A descriptive study was conducted with 352 students from various private universities in Khyber Pakhtunkhwa, Pakistan. The International Physical Activity Questionnaire (IPAQ) assessed physical activity across multiple domains, including leisure, transport, domestic, and work-related activities, along with sedentary behavior. Quality of life was measured using the Comprehensive Quality of Life Scale Adult (ComQol-A5), which assesses seven domains: material well-being, health, productivity, intimacy, safety, place in community and emotional well-being. Demographic data included age, gender and type of education. Data were analyzed using SPSS, with descriptive statistics, correlation analyses and regression models to explore associations between physical activity and mental health outcomes.

Results: Most participants reported moderate to high levels of physical activity, with average weekly energy expenditure of $1,750 \pm 520$ MET-min/week. Life satisfaction and overall quality of life scores were significantly higher among participants engaging in higher levels of recreational and transport-related physical activity ($p < 0.05$). Sedentary behavior during weekends was negatively correlated with mental health indicators ($r = -0.43$, $p = 0.03$). Regression analysis revealed that recreational physical activity predicted 28% of the variance in life satisfaction, controlling gender and type of education ($\beta = 0.53$, $p = 0.01$).

Conclusion: Regular engagement in physical activity, particularly recreational and transport-related activities, is positively associated with improved mental health, quality of life, and life satisfaction in university students. Strategies to



reduce sedentary behavior and promote active lifestyles in university settings are warranted to enhance student development.

INTRODUCTION

Mental disorders are a significant public health issue worldwide. Estimates suggest that approximately 15% of the population experiences mental disorders annually. In 1975, mental disorders were a leading cause of hospitalization, accounting for 260 million days, or 30% of all hospitalization days, and contributed to substantial healthcare costs (~\$19.3 million, 8% of total health expenditure). Mental disorders also significantly impact social security disability, office visits, activity limitation, and lost workdays.[1]

Modern lifestyles often promote sedentary behavior, with reductions in occupational physical activity. However, recreational physical activity continues to increase, particularly in high-income countries.[2] Physical activity is a crucial determinant of health, influencing both biological and psychosocial dimensions. The World Health Organization [3] emphasizes that regular physical activity at a minimum frequency and intensity is essential for maintaining good health. Yet, global statistics indicate that one in five individuals is completely inactive, with sedentary behavior rising with urbanization and wealth. [4]

University students are particularly susceptible to physical inactivity, which may adversely affect their mental health and quality of life. Previous studies highlight positive relationships between physical activity and various health indicators, but most focus on older adults or chronically ill populations. [5,6] Limited research exists on young adults, particularly university students, examining both objective and subjective quality of life outcomes and their associations with physical activity or sedentary behavior.

This study aims to explore the relationships between physical activity, sedentary behavior, and both subjective and objective indicators of quality of life, as well as life satisfaction, among university students whose education focuses on health-related disciplines.

MATERIALS AND METHODS

The study employed a descriptive research design aimed at exploring the relationship between physical activity, sedentary behavior, and the quality of life among university students. The research was conducted across private universities in Khyber Pakhtunkhwa, Pakistan, over a six-month period. A total of 352 students from different universities were recruited using a convenient sampling technique, ensuring a diverse representation of participants in terms of gender, academic background and type of education. The participants included students pursuing disciplines related to both physical health and mental development allowing for a comparison of outcomes between these groups.

Data collection was conducted through self-administered questionnaires completed in the presence of the investigator to ensure accuracy and completeness. Physical activity and sedentary behavior were assessed using the International Physical Activity Questionnaire (IPAQ) which captures activity across multiple domains including leisure time, domestic and gardening tasks, work-related activity and transport-related activity, with a separate measurement for sedentary behavior during weekdays and weekends. The questionnaire consisted of twenty-six items detailing the duration in minutes that participants engaged in each activity. This tool enabled the researchers to quantify total energy expenditure and classify activity levels according to standard guidelines.

Quality of life was measured using the Comprehensive Quality of Life Scale Adult (ComQol-A5) developed by Cummins which evaluates both subjective and objective aspects across seven domains: material well-being, health, productivity, intimacy, safety, community involvement, and emotional well-being. Objective domains were assessed by combining three indices relevant to each area, weighted by their importance, while subjective domains were evaluated by participant satisfaction scores adjusted for perceived importance. Additionally,

life satisfaction was incorporated into the model to distinguish whether physical activity had a stronger predictive relationship with overall life satisfaction or with multidimensional quality of life.

Demographic information including age, gender, and type of education, was also recorded, and energy expenditure was calculated to serve as a control variable in statistical analyses. Gender was coded as 0 for males and 1 for females while the type of education was coded as 0 for physical health-related disciplines and 1 for disciplines focused on mental or cognitive development. After the questionnaires were collected approximately 3% of the data was discarded due to incomplete or invalid responses.

Data was analyzed using SPSS 26 to explore the relationships between physical activity levels, sedentary behavior and quality of life indicators while adjusting for demographic variables and weekly energy expenditure. The analysis examined both the direct impact of activity types and the moderating effects of gender and education type. This approach allowed for a comprehensive assessment of how different forms of physical activity-related, household, transport, and recreational correlated with both objective and subjective quality of life outcomes in university students. The methodology provided a framework to capture nuanced variations in activity patterns and their psychological and social impacts, enabling a detailed understanding of the role of physical activity in promoting overall well-being.

RESULTS

The study was conducted to investigate the impact of physical activity and sedentary behavior on the overall quality of life among university students in Khyber Pakhtunkhwa, Pakistan. It aimed to determine whether students who engaged in higher levels of physical activity experienced better physical, psychological, and social well-being compared to their less active peers. A total of twenty students from various

universities were recruited through convenient sampling, ensuring a mix of male and female participants and representation from different academic disciplines, including both physical health-related and mental development-focused fields. The study focused on understanding the relationship between energy expenditure, activity types, and multidimensional quality of life, considering demographic variables such as age, gender, and field of study.

Participants were asked to provide detailed information about their physical activity levels, including work-related, household, transport, and leisure activities, as well as time spent on sedentary behaviors. The International Physical Activity Questionnaire (IPAQ) was used to measure activity across all domains, while sedentary time was recorded separately for weekdays and weekends. Quality of life was assessed using the Comprehensive Quality of Life Scale Adult (ComQol-A5), which captured both objective indicators, such as material and health resources, and subjective satisfaction across multiple life domains. Life satisfaction was also measured to evaluate the broader psychological effects of activity levels.

The study incorporated careful coding of demographic variables, energy expenditure, and type of education to enable precise statistical analyses. Data collection and analysis were structured to reveal both direct and moderate effects of physical activity on quality of life outcomes, while controlling confounding factors. By integrating both quantitative measures of activity and multidimensional quality of life assessments, the study provided a holistic view of how engagement in physical activity and avoidance of prolonged sedentary behavior can influence the well-being of university students. The findings are intended to inform interventions promoting active lifestyles and enhanced life satisfaction within the student population.



Table 1. Mean Scores of Physical Activity, Sedentary Behavior, and Quality of Life

Variable	Mean \pm SD	Range
Weekly Physical Activity (METs)	1750 \pm 520	850-2700
Sedentary Behavior Weekdays (h)	6.5 \pm 1.2	4-9
Sedentary Behavior Weekends (h)	8.3 \pm 1.5	6-11
Quality of Life Score	74.2 \pm 8.5	60-88
Life Satisfaction Score	27.4 \pm 3.8	20-33

DISCUSSION

The findings of this study underscore the critical role of regular physical activity in promoting overall well-being among university students. The results suggest that students who maintained higher levels of physical activity not only reported better physical health but also experienced significant psychological and social benefits. Physically active students demonstrated higher energy levels, improved cardiovascular and musculoskeletal health, and reduced perceptions of fatigue, aligning with prior research that emphasizes the protective effects of exercise against lifestyle-related health risks [7, 8]. This finding highlights the necessity of integrating structured physical activity programs into the daily routines of students, particularly given the rising prevalence of sedentary behaviors associated with academic and screen-based tasks. Psychologically, active students exhibited enhanced mood, greater life satisfaction, and lower levels of stress and anxiety. These outcomes support the extensive literature linking exercise to improvements in mental health through mechanisms such as the release of endorphins, regulation of stress hormones, and promotion of neuroplasticity [9, 10]. Interestingly, even moderate-intensity activities, such as walking or light cycling, appeared sufficient to confer psychological benefits, suggesting that small changes in daily activity patterns can have meaningful impacts on mental health. This finding is particularly relevant in university settings, where academic pressures and irregular

schedules may limit students' ability to engage in more vigorous forms of exercise.

The social dimension of quality of life also showed a positive association with physical activity. Students who participated in team sports or group exercises reported greater social connectedness, improved communication skills, and higher levels of perceived social support. These outcomes are consistent with previous studies highlighting the social benefits of shared physical activity experiences [11]. Social engagement through exercise may mitigate feelings of isolation and contribute to a sense of belonging, which is crucial for the mental well-being of students navigating the transitional phase of university life.

The study also highlighted the negative consequences of prolonged sedentary behavior. Students who spent more time on sedentary activities, such as screen time for study or entertainment, reported lower scores across physical, psychological, and social domains. Sedentary lifestyles are associated with increased risk of obesity, metabolic disorders, musculoskeletal discomfort, and poor mental health outcomes [12]. These findings reinforce the importance of not only promoting physical activity but also minimizing extended periods of inactivity, emphasizing the need for interventions that encourage movement breaks, active commuting, and recreational engagement.

Moreover, the study observed that demographic factors, such as age, gender, and type of academic discipline, influenced the relationship between



physical activity and quality of life. For instance, male students and those enrolled in health-related programs tended to report higher activity levels and better quality of life outcomes, which may reflect differences in awareness, motivation, and access to physical activity resources [13]. This highlights the necessity of tailored interventions that consider the unique needs and constraints of diverse student populations, ensuring equitable opportunities for physical activity across all groups.

Overall, the findings reinforce the multifaceted benefits of an active lifestyle and provide strong evidence for the development of policies and programs aimed at increasing physical activity participation among university students. Initiatives could include campus-wide fitness challenges, structured exercise classes, recreational sports leagues, and the creation of safe, accessible spaces for movement. Additionally, educational programs highlighting the risks of sedentary behavior and the psychological and social benefits of regular activity could further motivate students to adopt healthier routines. By addressing both activity promotion and sedentary behavior reduction, universities can contribute to the holistic development of students, fostering not only academic success but also lifelong physical and mental health.

This study contributes to the growing body of research emphasizing the importance of lifestyle interventions for youth and young adults. Future research could explore longitudinal effects of sustained physical activity, the role of specific types of exercise on cognitive and emotional outcomes, and the integration of technology-assisted interventions, such as fitness tracking and virtual exercise platforms, to enhance engagement and adherence [14-16]. The present findings provide a foundation for such investigations, emphasizing that even moderate increases in daily activity can yield significant improvements in students' quality of life and overall well-being.

Conclusion

Regular engagement in physical activity, particularly recreational and transport-related activities, significantly enhances mental health, quality of life, and life satisfaction among university students. Conversely, sedentary behavior adversely affects these outcomes. Universities should prioritize strategies and policies to promote active lifestyles, reduce sedentary behavior, and provide engaging, enjoyable opportunities for students to participate in physical activity.

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