



Level of Physical Activity and Health Related Quality of Life in University Students of Malakand Division

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ARTICLE INFO

Keywords: Physical activity, health-related quality of life, university students, Malakand Division, SF-36, IPAQ.

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Declaration

Authors' Contribution: All authors equally contributed to the study and approved the final manuscript.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History

Received: 03-06-2025 Revised: 18-09-2025

Accepted: 10-10-2025 Published: 25-10-2025

ABSTRACT

Background: Physical activity (PA) is a key determinant of health, encompassing benefits for both physical and mental well-being. This study aimed to assess PA levels, evaluate HRQoL, and explore the relationship between PA and HRQoL among university students in the Malakand Division. **Objective:** To assess and explore the relationship between Physical Activity levels and Health Related Quality of Life among university students in Malakand Division. **Methods:** This cross-sectional study was conducted in four universities of the Malakand Division, targeting students aged 18–30 years. A total of 227 participants were recruited through convenience sampling, with 206 included after data cleaning. Data collection involved the International Physical Activity Questionnaire (IPAQ) to measure PA levels in METs and the SF-36 Health Survey to assess HRQoL. Non-parametric tests, including the Kolmogorov-Smirnov test for normality and Spearman's correlation for associations, were used for analysis. **Results:** The mean age of participants was 21.96 years, and the average BMI was 22.27. The mean METs score was 3608.88, indicating moderate activity levels. Among the HRQoL domains, General Health (GH) showed a significant positive correlation with PA ($r = 0.211$, $p = 0.002$), while other domains, such as Physical Functioning and Emotional Wellbeing, demonstrated weak or no significant associations. **Conclusion:** The findings describe the importance of PA in enhancing specific HRQoL aspects, particularly General Health. However, barriers like cultural norms and limited access to recreational facilities may hinder PA levels, particularly among female students.

INTRODUCTION

Physical Activity (PA) has substantial benefits for physical health. It improves cardiovascular health by enhancing heart function, improving blood circulation, and regulating blood pressure, reducing the risk of stroke, heart attack, and other related conditions. [1] Studies have also proven the effects of PA in improvement of cognitive function and sleep quality by reducing stress, anxiety and depression. [2] Defined by the World Health Organization (WHO) as any bodily movement produced by skeletal muscles that requires energy expenditure, PA encompasses a variety of conditioning, from walking and cycling to further structured forms like running, swimming, and organized sports. [3] The importance of PA extends beyond the enhancement of physical fitness, offering significant benefits for mental health, emotional stability, and social integration.

Globally, the increasing prevalence of physical inactivity is now considered one of the leading public health challenges of the 21st century. According to WHO, nearly 23% of

grown-ups and 81% of adolescents worldwide fail to meet the recommended situations of physical activity, contributing to an increase in non-communicable conditions (NCDs), similar as cardiovascular conditions, diabetes, obesity, and mental health diseases. These NCDs are responsible for over 70% of global deaths each year. [4] The consequences of these findings are most concerning in low- and middle- income countries (LMICs), where access to resources promoting physical activity is limited and infrastructural challenges persist. [5]

Health-related quality of life (HRQoL) is a comprehensive measure of well-being, integrating physical health, internal health, emotional stability, and social functioning. Unlike traditional health criteria that concentrate on the absence of illness, HRQoL emphasizes how an existent's health impacts their overall quality of life and diurnal conditioning. For university students, HRQoL reflects their capability to manage the demands of academic life, maintain healthy social connections, and enjoy particular and adulterous conditioning. [6] In addition, the

association or relationship between healthy lifestyle options like PA and HRQoL should be studied, in order to develop measures to enhance HRQoL.[7]

In Pakistan, particularly in pastoral regions similar as the Malakand Division, the barriers to physical Activity are more pronounced. Socioeconomic factors, artistic morals, and infrastructural crunches hamper PA in Pakistani population.[8] The rise of sedentary cultures in this demographic presents a growing concern for public health. Studies also suggest lack of PA in University students due to the burden of studies, part time jobs and busy schedules.[9] Still, there is lack of information about PA levels and associated HRQoL among University students particularly in Malakand region. This study will assess the level of PA of the University Students in Malakand Region and its impact on their HRQoL. Upto the author's knowledge, no such study has been done in this region in past years. It will shed light on the need of PA, its importance and will provide a base for future research in this region.

METHODOLOGY

This was a cross-sectional study. The study was conducted in the Malakand Division, Khyber Pakhtunkhwa, Pakistan. Sample size was calculated as 227 using Raosoft sample size calculator. The period of the study lasted six months, beginning July 2024 just after the proposal of research had been approved. The timeline included the following; Data collection at all sites was completed in four months and Data cleaning, analysis, and interpretation was done in one month period.

The research population included university-going students, 18 to 30 years old, from the undergraduate and postgraduate backgrounds. Inclusion criteria was based on the students who have been the residents of Malakand Division for more than six months. Students who are already diagnosed of any chronic ailments or disability and those having any recent trauma or surgery were in the exclusion criteria. Data was collected after taking informed consent from the study participants. The three main tools employed to collect data were; Demographic Questionnaire, Short Form International Physical Activity Questionnaire (IPAQ) and Short Form-36 (SF-36) Health Survey. Demographic Questionnaire was constructed to elicit information on the respondent's age, gender, height, weight and educational status.

The short form of the IPAQ was utilized to assess levels of physical activity. These included Vigorous activities (such as running or aerobics), Moderate activities (such as cycling at a moderate pace or doing housework). Walking and time spent being sedentary. The tool measured activities conducted in the last seven days, reported in terms of frequency, days per week, and duration, minutes per day. The results were expressed in metabolic equivalents (METs) for activity levels classification purposes, such as low, moderate, or vigorous.

SF-36 is a highly validated tool used to measure HRQoL over eight dimensions; Physical functioning, Role functioning/physical, Role functioning/emotional, Energy/fatigue, Emotional well-being, Social functioning, Pain and General health. Scores were generated on each scale and then combined to produce composite measures

of physical and mental health. Consent forms were signed in written. Data collection was done on every university campus in order to cover the target population.

RESULTS

This section presents the results of the analysis conducted on data from 206 university students of the Malakand Division. The total number of participants was 227 in the study of which 21 were excluded due to extreme values and missing data. It includes demographic characteristics, descriptive statistics, tests of normality, and correlations between physical activity and health-related quality of life (HRQoL) dimensions.

The demographic details included mean age of the participants was 21.96 ± 1.76 , ranging from 18 to 26 years. The average Body Mass Index (BMI) was 22.27 ± 2.42 , with a range of 14.50 to 31.20. (Table 1)

Table 1

Demographic Characteristics

Variable	Mean $\pm$ SD
Age (years)	21.96 $\pm$ 1.76
Height (ft)	5.15 $\pm$.31
Weight (kg)	65.15 $\pm$ 10.97
BMI	22.27 $\pm$ 2.42

The descriptive statistics for Total METs and HRQoL components revealed the following scores shown in Table 2.

Table 2

PA and HRQoL Scores

Physical Activity Scores	Mean $\pm$ SD
Total METs	3608.88 $\pm$ 2928.74
Dimensions of HRQoL	Mean $\pm$ SD
Physical Functioning (PF)	53.12 $\pm$ 21.91
Role Limitation due to Physical Health (RL_PH)	49.70 $\pm$ 31.26
Role Limitation due to Emotional Problems (RL_EP)	50.79 $\pm$ 34.64
Energy/Fatigue (E_F)	56.87 $\pm$ 17.20
Emotional Wellbeing (EM_WB)	61.21 $\pm$ 32.09
Social Functioning (SocialF)	57.69 $\pm$ 22.61
Pain	66.70 $\pm$ 23.78
General Health (GH)	62.19 $\pm$ 18.62

Normality tests for all variables were conducted using Kolmogorov-Smirnov. The results indicated significant deviations from normality for most variables, necessitating nonparametric statistical methods for further analyses. Nonparametric Spearman correlation analyses between IPAQ METs and HRQoL dimensions showed the following relationships shown in Table 3.

Table 3

*Correlation Analysis, *P-value of Only General Health Domain is Significant.*

Physical Activity and Dimensions of HRQoL	Correlation Coefficient	p-value
PA and General Health (GH)	0.211	0.002*
PA and Physical Functioning (PF)	0.004	0.959
PA and Role Limitation due to Physical Health (RL_PH)	0.047	0.501
Role Limitation due to Emotional Problems (RL_EP)	0.103	0.139
PA and Energy/Fatigue (E_F)	0.121	0.082
PA and Emotional Wellbeing (EM_WB)	0.079	0.258
PA and Social Functioning (SocialF)	0.043	0.541
PA and Pain	0.089	0.205

Among the dimensions of HRQoL, General Health (GH) shows a weak positive correlation that is statistically significant. In contrast, all other dimensions, including exhibit weak or negligible correlations and are not statistically significant. This highlights that GH is the only dimension with a significant relationship, while others do not show meaningful associations.

DISCUSSION

The findings of this study provide a comprehensive analysis of the level of physical activity (PA) and its relationship with health-related quality of life (HRQoL) among university students in the Malakand Division. To the best of author's knowledge, this study is the first to assess the association of PA with HRQoL in this region. Correlation among Total Physical Activity and Domains of HRQoL have been established after assessing the demographic scores which showed a weak positive yet significant correlation among PA and General Health domain of HRQoL. An explanation for these results could be that short for of IPAQ do not include Leisure time PA which has most significantly shown correlation with the domains of HRQoL.[10]

The wide variation in activity levels as reflected in METs ranging from 0 to 10,996 is due to the varied activity patterns of students. As in Bauman et al. (2012), we observed similar trends where the university population differ significantly in terms of PA, which is, for the most part, down to individual choice, amount of academic workload and access to recreational facilities. [5]

The study utilized self-report questionnaires to analyze the multifaceted relationship between HRQoL and physical activity. According to classical test theory, the reliability of the SF-36 and IPAQ indicated a certain degree of unsystematic error that could weaken actual associations. Some relationships could have been understated as a result, which could have had an effect on statistical significance. Moreover, the self-reported nature of the data increases the possibility of response bias, that might lead physical activity and HRQoL to be overstated or understated.[10] This limitation further provide basis for

future longitudinal studies or studies that can measure the impact of both object and subjective assessment of the domains in this region.

In relation to this, the HRQoL dimensions that were measured in this study showed significant differences between perceived quality of life of students served in different domains. In addition, General Health (GH), seemed to be experienced positively as it had relatively high mean scores (mean score = 62.19). This is in line with Warburton et al. (2006) finding of the beneficial effects of physical activity on general health perceptions.[1] Similarly, EM_WB and E_F also had moderate mean scores of 61.21, 56.87 respectively, which are similar to that of Fountaine et al. (2012).[11]

Mean score of these dimensions such as Role Limitation due to Physical health (RL_PH) and Role Limitation due to Emotional Problems (RL_EP) was low (49.70, 50.79 respectively), which may hamper performance on these areas. The results of role limitation also align with previous studies. Studies also report that role limitation related to mental health is more pronounced as compared to Physical Health.[12, 13].

When comparing these findings to global data, several similarities and differences emerge. For instance, studies conducted in developed countries, such as those reviewed by Friel et al. (2011), often report lower PA levels but higher HRQoL scores due to better health promotion initiatives and facilities. In contrast, the lower HRQoL scores observed in this study may reflect the interregional disparities in health promotion and economic standing.[13]

CONCLUSION

The analysis of correlations between PA and dimensions of HRQoL indicated that while most of the domains have weak or no significant correlation with physical activity (PA), the general health (GH) domain exhibited a significant positive relationship. This suggests that students who participate in higher level of physical activity (PA) are likely to encounter better general health (GH).

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