ORIGINAL ARTICLE

The Relationship between Physical Activity and Health-Related Quality of Life among High School Students of Karachi, Pakistan

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Abstract

Background: Physical activity (PA) is crucial for promoting health-related quality of life, especially among children of all ages. PA influences both physical and psychological well-being, and its absence can lead to various health-related problems that disrupt overall quality of life. Therefore, this study aims to investigate the correlation between PA and HRQoL in high school students.

Methodology: We conducted a cross-sectional survey on high school students in Karachi, Pakistan, using a non-purposive sampling technique. The study included 378 students from various educational institutions. We collected data using a Physical Activity Questionnaire (PAQ) and a Pediatric Quality of Life Questionnaire (PED-QoL). The data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 21. The chi-square test was used to associate PA with HRQoL, with a significant $p<0.05$.

Results: Findings suggest that 79.8% of the total population have a healthy QoL, but on the other hand, 54.4% have low PA levels. The Spearman's correlation test ($r=0.145$, $p=0.005$) indicated significant evidence of a weak positive correlation between both variables among high school students.

Conclusion: A weak positive association between PA and HRQoL in high school students was revealed. Although it is an observational study, a prospective survey must systematically analyze PA and QOL among high school students.

Keywords

Education, Health-related Quality of Life, Physical Activity, Young Adults.

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Introduction

Physical activity (PA) is vital in enhancing the quality of life (QoL), which is pivotal for psychological and physical well-being[1]. A diminishing QoL has been extensively linked with the prevalence of psychosomatic disorders, impaired motor functions, and a reduction in social engagement among young adults. Globally, physical inactivity ranks as the fourth leading cause of death, responsible for approximately 1.9 million fatalities annually[2-3]. Specifically, in Pakistan, an alarming 60% of adults exhibit a lack of physical activity[4-5], subsequently elevating the risk of developing severe health conditions such as cancers, cardiovascular diseases, and diabetes[6-9].

Research has meticulously documented the sedentary lifestyle predominating among children within this demographic, attributed to an increased engagement with television, video gaming, and computer use. These activities significantly elevate the risk of obesity, cardiovascular complications, behavioral issues, and disruptions in sleep patterns, thereby detrimentally impacting their quality of life[10-11]. Moreover, transitioning from high school to college marks a critical phase where lifestyle alterations, spurred by heightened responsibilities and peer pressure, potentially lead to decreased physical activity. This reduction in PA is associated with adverse social behaviors and a lower quality of life[12-14].

Evidence substantiates that health-related quality of life (HRQoL) positively correlates with physical activity, enhancing self-efficacy and overall life satisfaction through improved physical and psychological states[15]. However, it is essential to note that this relationship is contingent upon the type and intensity of physical activity. It varies across different domains of QoL, including physical, social, psychological, and environmental aspects[16].

Recent developments aimed at countering the lack of physical activity among children have identified school-based interventions promoting physical awareness and encouraging school-related physical activities as critical components of a comprehensive strategy[17]. While a considerable volume of research has analyzed the association between PA and HRQoL in the elderly, there is a noticeable dearth of data about children. No study has yet addressed this subject in Karachi, Pakistan.

Therefore, it is imperative to understand the relationship between physical activity and HRQoL, particularly among high school students, to foster a holistic approach to health and well-being from an early age.

Methodology

Study Design

A cross-sectional survey assessed the relationship of physical activity with high school students' health-related quality of life.

Inclusion and Exclusion Criteria

Students aged between 14 to 18 years enrolled in high school were included. Those with a history of physical or mental disorders or those who had suffered fractures in the past six months were excluded.

Sampling Technique

A non-probability, purposive sampling technique was employed to collect a representative and relevant sample from the student population.

Sample Size

The study comprised a sample size of 378 students. This number was calculated using the sample size calculator, Open EPI version 3, based on a hypothesized frequency of 42.3%, a confidence limit of 5%, and a design effect of 1% using a study of Puciato et al[1].

Outcome Measures

- The Physical Activity Questionnaire for Adolescents (PAQ-A) consists of 9 items that assess the general levels of physical activity in adolescents[18]. This self-administered questionnaire is considered reliable and valid as it covers a wide range of activities that have taken place over the last seven days.

- The Pediatrics Quality of Life (PEDSQL) questionnaire comprises 32 items designed to measure various aspects of health-related quality of life in children and adolescents[19]. It focuses on four domains: physical, emotional, social, and school functioning.

Survey Distribution

The questionnaires were distributed among students from various institutions, including the VMT Schooling System, Student Zone Schooling System, Delhi Government Boys Secondary School, Delhi Government Girls Secondary School, Hashmat Memorial Secondary School, and DJ Science College. The data collection phase spanned five months.

Ethical Considerations

Approval was obtained from the institutional review board of DUHS before the commencement of the study. Investigators secured informed consent from participants after thoroughly explaining the study's purpose, thus upholding ethical standards.

Data Analysis

Data was entered and analyzed using the Statistical Package for the Social Sciences (SPSS) edition 21. Analytical methods were applied, including computing means and standard deviations for age and measuring frequencies and percentages for categorical variables. The chi-square test assessed the association between PA and HRQoL, aiming for a significance level of less than 0.05.

Results

The population consisted of 378 students; 264 were male, and 114 were female. It was observed that males have a higher mean physical activity score than females, indicating that, on average, males are more physically active than females. The details are depicted in Table-1.

Table-1 Mean Values of PA & QoL

Gender	Physical Activity Mean±SD	Quality of Life Mean±SD
Male	2.40±0.78	80.01±10.87
Female	2.23±0.60	78.86±9.41
Total	2.35±0.73	79.67±10.45

The scoring of HRQOL was found to be a minimum 0 or maximum of 100 with a cutoff value of 69.70 out of 100. The participants below this value were at risk of impaired QoL, and those who had scored above this value were found to have a healthy QoL. The scoring of PA was found to be minimum one or maximum 5, categorized as low PA if the value ranges from 1 to 2.33, moderate PA from 2.34 to 3.66 and high PA from 3.67 to 5 (Table-2).

Table-2 Cut-off Values

PA Levels	Mean±SD	QoL Types	Mean±SD
Low	1.80±.035	**Risk for Impaired HQRL**	64.30±4.68
Moderate	2.90±0.39	**Healthy QoL**	83.53±7.53
High	3.95±0.19		

In a study, it was observed that a majority of both males and females had a healthy QoL. Nonetheless, a noticeable minority were at risk for impaired QoL. Additionally, the study assessed PA levels among participants. A significant portion of both males and females exhibited low PA. A considerable number reported moderate PA, while only a few engaged in high PA. These

findings highlight the need for targeted interventions aimed at improving both QoL and PA levels among high school students (Table-3).

Table-3 Responses of Participants on Questionnaires

Category	Male	Female	Total
Quality of Life			
Impaired QoL	57 (15%)	19 (5%)	76 (20.1%)
Healthy QoL	207 (54.7%)	95 (25.1%)	302 (79.8%)
Total	264 (69.8%)	114 (30.1%)	378 (100%)
Physical Activity **Levels**			
Low	134 (35.4%)	72 (19%)	206 (54.4%)
Moderate	115 (30.4%)	39 (10.3%)	154 (40.7%)
High	15 (3.9%)	3 (0.7%)	18 (4.7%)
Total	264 (69.8%)	114 (30.1%)	378 (100%)

The Spearman's correlation test (r=0.145, p=0.005) indicated that there is significant evidence of a weak positive correlation between PA and QoL among high school students (Table-4).

Table-4 Spearmen Correlation Test

			PA	QoL
Spearman's rho	**PA**	Correlation Coefficient	1.000	.145**
		Sig. (2-tailed)	.	.005
		N	378	378
	QoL	Correlation Coefficient	.145**	1.000
		Sig. (2-tailed)	.005	.
		N	378	378

Discussion

This study found that the level of PA directly influenced the QoL among high school students. The Spearsman's correlation test results showed a weak positive correlation between PA and QoL in high school students. High levels of PA were associated with the highest health-related QoL. Statistically significant differences in QoL were observed between individuals who were highly active physically and those with moderate or low levels of PA. However, no significant differences were noted in impaired QoL among highly, moderately, and physically active respondents.

Our study's findings can be compared to a similar survey conducted by Puciato et al.[1], which revealed a significant association between general QoL and PA levels. In both studies, general QoL was highest among highly physically active participants, followed by moderately active participants, and lowest in those who were less physically active. However, it is essential to note that the weak positive association between PA and QoL in our study could be due to differences in sample size and demographic focus between the two studies.

Studies have observed a positive association between PA and QoL[20-21]. Likewise, Pucci et al.[16] have found that different types of PA are associated differently with QoL for males and females across various domains of QoL. Leisure PA correlated with more QoL domains than transport PA. However, our study indicates a weak positive relationship, possibly due to the smaller sample size of 378 students in Karachi, Pakistan. Our study used the PEDS-QL questionnaire to measure QoL and the PAQ-A questionnaire to assess PA levels in Pakistan.

McAuley et al.[15] also suggested an indirect positive relationship between PA and QoL, where PA influences self-efficacy and QoL through physical and psychological well-being. However, the weak positive association observed in our study may be attributed to differences in the assessment of variables compared to the study by McAuley et al. They used the Physical Activity Scale for the Elderly (PASE) instead of the PAQ-A questionnaire for PA and the Satisfaction with Life Scale (SWLS) instead of PEDS-QL for QoL.

A significant strength of this research lies in its focused approach, considering only school-going children, which differs from previous studies primarily targeting adults. The 100% return rate of the questionnaires ensured a comprehensive sample from Karachi, providing valuable insights from male and female participants across different city areas.

However, the study faces limitations due to its cross-sectional survey nature, lack of an outcome measure tool, and geographical restriction to Karachi. The findings suggest the necessity of a prospective study that would encompass a broader spatial scope to enhance the understanding of PA and QoL amongst high school students beyond Karachi and potentially across other Asian countries.

Conclusion

This study demonstrates a significant, albeit weak, positive association between PA and QoL among high school students. Despite being observational, it advocates for future prospective

surveys to methodically examine the relationship between PA and QoL on a larger scale and in more diverse settings.

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Conflict of Interest
None.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: Perkash O, Rajani MA, Rizwan M

Acquisition, Analysis or Interpretation of Data: Perkash O, Rajani MA, Lal H

Manuscript Writing & Approval: Perkash O, Rizwan M, Banwa

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.