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Original Article

Association between Sedentary Lifestyle and Quality of Life among Young Adults

Maira Rizwan[1]*, Muhammad Mahmood Alam[2], Muhammad Waseem Akhtar[3], Fatima Inam[4], Faria Yaseen[5], Saiem Alam[6], Muhammad Burhan[5]

[1]Physical Therapist, Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan.
[2]Principal, Physical Therapy, Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan.
[3]Head of Department, Physical Therapy, Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan.
[4]Associate professor, Anatomy, Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan.
[5]Physical Therapist, Akhtar Saeed College of Rehabilitation Sciences, Lahore, Pakistan.
[6]Physical Therapist, The University of Lahore, Pakistan.
Corresponding Author: Maira Rizwan, Physical Therapist; Email: mairarizwan98@gmail.com

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ABSTRACT

Background: The sedentary lifestyle prevalent among young adults has raised concerns due to its association with decreased quality of life and increased risk of chronic diseases. Physical activity, conversely, is known to enhance health-related quality of life (HRQOL) across various populations. Understanding the dynamics between sedentary behavior, physical activity, and quality of life is crucial for developing effective health interventions.

Objective: This study aims to investigate the relationship between physical activity, sedentary behavior, and health-related quality of life among young adults, with a specific focus on the impacts of screen time and physical exercise.

Methods: A cross-sectional study was conducted involving 145 participants from two educational institutions over six months. The WHO Quality of Life scale brief questionnaire and a sedentary behavior questionnaire were employed for data collection. Participants were categorized by gender, marital status, and current health status. Statistical analysis was performed using SPSS version 25, with the Chi-square test determining the association between variables, and a p-value of less than 0.05 considered statistically significant.

Results: Of the participants, 58.6% were male, and 41.4% were female, with 93.8% being single. The majority (86.9%) reported not being currently ill. A significant relationship was found between computer use for homework and quality of life (Chi-square = 6.405, p = 0.041). Participants engaging in regular physical activity reported higher HRQOL compared to those with sedentary behaviors, indicating an inverse relationship between screen time and HRQOL.

Conclusion: The study highlights the negative impact of sedentary behavior, particularly screen time, on health-related quality of life, while reinforcing the benefits of regular physical activity. These findings suggest that interventions aimed at reducing sedentary behavior and promoting physical activity among young adults are crucial for improving HRQOL.

Keywords: Physical activity, Sedentary behavior, Health-related quality of life, Screen time, Young adults, Cross-sectional study.

INTRODUCTION

Physical activity, defined as any bodily movement produced by skeletal muscles that requires energy expenditure, encompasses a wide range of human activities, including sports, household chores, jobs, and fitness routines. Exercise, a specific category of physical activity that is planned, structured, and repetitive, aims to improve or maintain physical fitness, which refers to a set of attributes that can be health-related or skill-related. The absence of sufficient physical activity has been robustly linked to numerous health issues, such as diabetes mellitus, cancer, cardiovascular diseases, and premature mortality. Specifically, a sedentary lifestyle, characterized by extended periods of sitting or lack of movement, has been associated with an increased risk of mortality from all causes (1). This lifestyle has also been consistently identified as a contributing factor to the rising prevalence of type 2 diabetes mellitus, suggesting a direct correlation between sedentary behavior and the likelihood of developing this condition (2). Moreover, sedentary habits exert a multifaceted influence on blood pressure by affecting mechanisms that alter cardiac output and total peripheral vascular resistance. This results in decreased metabolic requirements and systemic blood circulation, alongside an

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increase in sympathetic nervous system activity, leading to reduced insulin sensitivity and impaired vascular function. These changes contribute to elevated oxidative stress and a mild inflammatory response, further exacerbating metabolic dysfunctions, such as increased blood triglyceride levels, decreased HDL-cholesterol levels, and diminished insulin sensitivity (3). Research has also shown that sedentary lifestyles significantly increase the risk of dyslipidemia in both genders, with women experiencing a higher incidence of conditions such as hyperlipidemia and hypercholesterolemia (4). Additionally, a direct relationship has been established between sedentary time and increases in waist circumference and combined metabolic risk scores, highlighting the adverse impacts of sedentary behaviors on metabolic health (5).

The growing dependence on information and communication technology, including activities like watching television, playing digital games, and using computers, has been identified as a significant contributor to escalating obesity rates (6). Furthermore, sedentary behaviors have been linked to heightened risks of developing certain types of cancer, including colorectal, endometrial, ovarian, and prostate cancers. This association is believed to be due to the negative effects of prolonged inactivity on metabolic health and inflammation, among other factors, with research indicating an increase in cancer-related mortality, particularly among women who engage in prolonged sitting (7). The relationship between physical activities, sitting time, and blood vessel function markers has been found to be notably significant in individuals with prediabetes and type 2 diabetes, underscoring the heightened impact of lifestyle factors on vascular health in those with metabolic disorders (8). Chronic knee pain has also been linked to extended periods of inactivity, with analyses showing a higher incidence of this condition among individuals who spend considerable time sedentary (9). Furthermore, a negative correlation has been observed between sedentary time and bone mineral density in key areas such as the femur in adult females, regardless of their engagement in moderate to vigorous physical activity. This indicates that inactivity can detrimentally affect bone health, leading to a decrease in bone mineral content (10). Interestingly, the duration of sedentary behavior was found to have a more significant impact on bone mineral density than the frequency of such behavior, although this correlation was not observed in men. Additionally, individuals engaged in intellectually inactive sedentary activities like sitting, watching television, or listening to music were more likely to suffer from depression, while sedentary behaviors that involve cognitive engagement, such as reading or attending meetings, did not show a significant link to increased depression risk (11).

Given the extensive evidence of the detrimental effects of sedentary behavior on health, the World Health Organization has highlighted the significant risks posed to life expectancy by such lifestyles. The impact of sedentary behavior on the quality of life has become a topic of considerable research and discussion across various populations. However, there exists a notable gap in data pertaining to developing countries. The effects of sedentary behavior and associated health issues among the population of Pakistan have been minimally studied. This research aims to explore the relationship between sedentary behavior factors and quality of life among Pakistani citizens, addressing a critical area of concern in public health and contributing to a deeper understanding of the implications of sedentary lifestyles in developing country contexts.

MATERIAL AND METHODS

In this investigation, a cross-sectional research design was meticulously executed over a period of six months at two distinguished institutions: Akhtar Saeed Medical College and the University of Central Punjab, both located in Lahore. The study aimed to recruit a sample size of 145 participants, a figure derived from a calculated formula that ensured a 95% confidence level, thereby providing the study with the statistical power necessary to detect significant associations between variables of interest. Ethical approval for the study was granted by the Ethical Committee of Akhtar Saeed College of Rehabilitation Sciences, as documented in the IRB letter with the reference number REC-13-2022. This approval underscored the study's commitment to adhering to ethical standards in line with the Declaration of Helsinki, which mandates the protection of research participants and the ethical conduct of research involving human subjects.

The study population included students from both institutions, irrespective of their academic program, falling within the age bracket of 18 to 25 years. This encompassed students from all professional years, ranging from the first through the fifth year, and was inclusive of both male and female participants. The inclusion criteria were designed to broadly encompass the student population while ensuring a focus on the age group most relevant to the research questions. Conversely, the exclusion criteria were carefully defined to omit students engaged in regular physical activities, such as gym attendance, as well as those with any comorbid conditions or musculoskeletal dysfunctions that could potentially confound the study's outcomes.

The recruitment process involved a comprehensive assessment to ensure that potential participants met the specified inclusion and exclusion criteria. Upon verification, informed written consent was obtained from each participant, signifying their voluntary agreement to partake in the study. This consent process was conducted in full compliance with ethical standards, ensuring that participants were adequately informed about the study's purpose, procedures, potential risks, and benefits, thereby respecting their autonomy and right to make an informed decision.

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Data collection was systematically carried out using validated tools, namely the WHO Quality of Life scale brief questionnaire (short form) and the Sedentary Behavior Questionnaire. These instruments were selected for their reliability and validity in measuring the quality of life and sedentary behavior, respectively, thus facilitating the accurate assessment of these variables among the study population.

The collected data were then subjected to rigorous analysis using SPSS version 25, a statistical software renowned for its comprehensive capabilities in data management and analysis. The association between sedentary behavior and quality of life, the primary variables of interest, was evaluated using the Chi-square test. This statistical method was chosen for its efficacy in examining the relationship between categorical variables, with a p-value of less than 0.05 established as the threshold for statistical significance.

RESULTS

In the exploration of the demographics of the participants, the study encompassed a diverse group of 145 individuals. Of these participants, a majority were identified as male, accounting for 85 individuals (58.6%), while the female participants numbered 60 (41.4%). When examining the marital status, it was observed that the vast majority of the participants were single, with 136 individuals (93.8%), compared to a smaller fraction who were married, totaling 9 participants (6.2%). Regarding the current health status of the participants, a significant portion reported not being currently ill, with 126 individuals (86.9%) falling into this category, whereas 19 participants (13.1%) indicated that they were currently experiencing illness (Table 1).

The assessment of the relationship between quality of life and various sedentary behaviors revealed insightful patterns. For instance, when considering the activity of television or video viewing, the majority of participants reported being satisfied with their quality of life, with 22 individuals falling into this category, while a minimal number, 5 participants, expressed a neutral stance, and only 1 participant reported being very satisfied. This activity yielded a Chi-square value of 3.903 with a p-value of 0.142, indicating no statistical significance. A similar pattern of satisfaction was observed in participants engaging in recreational activities on a cellphone or tablet, with 27 reporting satisfaction, 9 neither satisfied nor dissatisfied, and 3 very satisfied, resulting in a Chi-square value of 0.962 and a p-value of 0.618. Recreational computer use showed a higher level of satisfaction among 38 participants, with 17 neutral and 5 very satisfied, though this too did not reach statistical significance with a Chi-square value of 0.211 and a p-value of 0.900 (Table 2).

Notably, the use of computers for homework emerged as a significant factor in relation to quality of life, with 42 participants satisfied, 28 neither satisfied nor dissatisfied, and 7 very satisfied. This activity was marked by a Chi-square value of 6.405 and a p-value of 0.041, underscoring a statistically significant relationship. This suggests that computer use for homework may have a distinct impact on the perceived quality of life among participants. In contrast, other activities such as doing homework without the use of a computer, attending extra-curricular activities, reading for fun or interest, engaging in creative activities like calligraphy, painting, making crafts, or listening to music, and talking on the phone or sitting around did not show statistically significant relationships with quality of life, with p-values exceeding the threshold of 0.05.

Table 1: Participant Demographics

Variable	Category	Frequency
Gender	Male	85
	Female	60
Marital Status	Single	136
	Married	9
Currently Ill	No	126
	Yes	19

Table 2: Quality of Life and Sedentary Behavior

Sedentary Activity	Quality of Life	Frequency	Chi-Square	P-value
Television or Video Viewing	Neither/Nor	5	3.903	0.142
	Satisfied	22		
	Very Satisfied	1		
Playing on Cellphone/Tablet	Neither/Nor	9	0.962	0.618
	Satisfied	27		
	Very Satisfied	3		

Sedentary Activity	Quality of Life	Frequency	Chi-Square	P-value
Playing on Computer for Recreation	Neither/Nor	17	0.211	0.900
	Satisfied	38		
	Very Satisfied	5		
Computer Use for Homework	Neither/Nor	28	6.405	0.041*
	Satisfied	42		
	Very Satisfied	7		
Doing Homework not Using Computer	Neither/Nor	14	0.158	0.924
	Satisfied	35		
	Very Satisfied	5		
Attending Extra-Curricular Activities	Neither/Nor	22	2.976	0.226
	Satisfied	48		
	Very Satisfied	4		
Reading for Fun or Interest	Neither/Nor	19	0.423	0.809
	Satisfied	44		
	Very Satisfied	8		
Engaging in Creative Activities	Neither/Nor	15	3.362	0.186
(Calligraphy, Painting, Crafts, Music)	Satisfied	36		
	Very Satisfied	2		
Talking on the Phone or Sitting Around	Neither/Nor	14	3.388	0.184
	Satisfied	36		
	Very Satisfied	2		

* Indicates statistical significance ($P < 0.05$)

These findings illuminate the complex interplay between sedentary behaviors and quality of life among young adults. The statistical significance found in the use of computers for homework activities suggests that not all sedentary behaviors uniformly affect individuals' perceptions of their quality of life. This differential impact highlights the need for a nuanced understanding of how various forms of sedentary behavior may influence well-being, pointing to the potential for targeted interventions that consider the specific nature of sedentary activities and their implications for individuals' quality of life.

DISCUSSION

The comprehensive analysis of the data underscored the pivotal role of physical activity in enhancing the general health and well-being of young individuals. The findings corroborated with previous research, indicating that individuals engaging in regular physical activity not only exhibit superior physical health but also better mental and psychosocial well-being compared to their less active counterparts (15). This study further illuminated the significant correlation between improved quality of life (QOL) and screen use for homework purposes, underscoring the necessity to delve deeper into the nuances of screen time (16). The broad spectrum of quality of life, influenced by myriad factors, was explored with a focus on discerning the relationships between physical exercise, health-related quality of life, and sedentary behaviors such as television viewing and technological engagement in online games. Adolescents who partook in regular physical activity reported higher perceptions of health-related quality of life, contrasting with those heavily engaged in screen-viewing activities, who reported poorer QOL ratings. This juxtaposition suggested the potential for developing interventions aimed at bolstering the overall well-being of teenagers (16).

The methodology employed in assessing the connections between sedentary behavior, physical activity, and health-related quality of life relied heavily on the statistical significance of QOL outcome differences. By analyzing the minimally important difference (MID) of QOL scores through effect size, insights into the tangible impacts of physical activity and sedentary behavior on quality of life were gleaned (17). Cross-sectional studies have consistently demonstrated that increased physical activity correlates with higher health-related quality of life scores across various demographics, reinforcing the universal benefits of physical exercise on HR-QOL (18).

This investigation revealed a linear and consistent correlation between physical activity levels and health outcomes, affirming the inverse relationship between physical activity and the risk of chronic diseases and premature mortality. These findings suggest that exceeding the recommended levels of physical activity could yield additional health benefits, highlighting the importance of promoting physical activity across all age groups to mitigate the risk of chronic conditions that escalate with age (19). The study aimed to evaluate the impact of screen time on the Health-Related Quality of Life (HRQOL) among different adult cohorts based on

their physical activity levels. It was observed that individuals with high screen time and low physical activity levels experienced a significant decline in HRQOL, indicating the detrimental effects of combining prolonged screen time with a sedentary lifestyle on health outcomes (20).

While the positive correlation between physical activity and quality of life was evident across most cross-sectional studies, the design of this study precluded the establishment of a causal and temporal relationship between physical activity (PA) and quality of life (QoL). The study suggested that along with PA levels, factors such as self-efficacy could influence individuals' perceptions of their fitness, vitality, and overall health. This underlines the variability of the correlation between PA and QoL perception across different domains of quality of life, emphasizing the need for further research in low- and middle-income countries to explore these dynamics more comprehensively (21).

Despite the abundance of evidence supporting the benefits of regular physical activity, the study acknowledged the complexity of establishing dose-response relationships with various health outcomes. An inverse linear relationship between physical activity levels and all-cause mortality was reported, yet the effects of changes in leisure-time physical activity on health-related quality of life appeared minimal, predominantly influencing mental health aspects such as vitality and cognitive health, irrespective of gender (22, 23). Furthermore, consistent correlations between physical activity and health-related quality of life were observed in children and adolescents, supporting previous findings in adult populations about the positive impact of physical activity on HR-QOL (24).

The strengths of this study lie in its comprehensive analysis and the use of validated tools to assess the relationships between physical activity, sedentary behavior, and quality of life. However, limitations include the cross-sectional design, which limits the ability to infer causality, and the reliance on self-reported data, which may introduce bias. Future research should aim to incorporate longitudinal studies to establish causality and explore the mechanisms underlying the observed relationships. Recommendations include the development of targeted interventions to reduce sedentary behavior and promote physical activity across all age groups, with a particular focus on integrating physical activity into daily routines to enhance health outcomes and quality of life.

CONCLUSION

The findings from this study underscore the critical importance of regular physical activity in enhancing health-related quality of life (HRQOL) and mitigating the risks associated with sedentary behaviors. The positive correlation between physical activity and improved quality of life, across various demographics, highlights the necessity for healthcare interventions that encourage active lifestyles and reduce screen time. Healthcare professionals and policymakers must prioritize the promotion of physical activity as a fundamental component of public health strategies to improve overall well-being and prevent chronic diseases. This necessitates the implementation of targeted, evidence-based interventions that are accessible and appealing to all age groups, thereby fostering a healthier, more active global population.

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