

Exploring the Association of Screen Time and Physical Activity with Mental Health among University Students in Peshawar



Iqra Ayaz¹, Rida Shabbir¹, Hakimullah²

Khyber Medical University, Peshawar, Khyber Pakhtunkhwa¹, Hayatabad Medical Complex, Peshawar, Khyber Pakhtunkhwa²

Corresponding Email: iqraayazkhan@gmail.com

Abstract

Background: The COVID-19 lockdown restricted movement and increased screen time, potentially affecting mental health. This study aimed to determine the association between screen time and physical activity with mental health in university students of Peshawar, Pakistan.

Methodology: This cross-sectional survey enrolled 232 students using the convenience sampling method and were asked to fill out the questionnaires on screen time, physical activity levels (IPAQ) and mental health (DASS-2). The impact of screen time and physical activity levels on mental health was analyzed using frequencies and contingency tables (cross-tabs).

Results: Among the participants, 37.90% reported experiencing depression, 40.90% anxiety, and 37.10% stress. Notably, 76% of those with mild anxiety exhibited low screen time. Furthermore, 46.7% of participants with mild stress engaged in high physical activity, and 52.6% of those with moderate stress had moderate physical activity. No significant correlations were found between depression, screen time, and physical activity.

Conclusion: Significant correlations were observed between stress and physical activity, as well as anxiety and screen time. These findings underscore the importance of considering both screen time and physical activity in addressing mental health concerns among students.

Keywords

Anxiety, Depression, COVID-19, Exercise, Screen Time.



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Introduction

The novel coronavirus (COVID-19), identified as a global pandemic by the World Health Organization (WHO), has triggered a health crisis and an unprecedented shift in daily life¹. The ramifications of the COVID-19 lockdown have transcended physical health, seeping into the realms of mental well-being. A cohort study found a rise in major depressive episodes and generalized anxiety disorder during the pandemic, highlighting a link between COVID-19 diagnosis and worsening mental health¹. As the world grappled with lockdown measures, individuals found themselves confined to their homes, devoid of the routine walks, park visits, and gym sessions that once contributed to an active lifestyle². This consequence leads to a surge in sedentary behavior and a noticeable decline in physical activity, posing potential threats to mental health¹⁻³. Moreover, the closure of educational institutions prompted a surge in screen time, with tablets, computers, laptops, phones, and personal computers becoming indispensable tools for communication and various activities².

Mental health, an essential aspect of life encompassing actions, emotions, and thoughts, has faced escalating challenges. Regardless of COVID-19, mental health has deteriorated over the past few years, especially in young adults, women, people with pre-existing mental health conditions, healthcare workers and Unemployed and financially strained individuals³⁻⁵. Studies published in *The Lancet* in 2021 estimated a global increase of 27.6% in major depressive episodes and 25.6% in anxiety disorders during the first year of the pandemic⁶.

The educational landscape underwent a radical transformation during the COVID era, with institutions embracing virtual or online programs. While instrumental in maintaining academic continuity, this shift necessitated increased screen usage, proving pivotal for assignment submissions, teaching, and feedback⁶. However, this newfound reliance on screens has a flip side, contributing to stress, compromised sleep, and reduced physical activity. A study in China reported that 70% of participants reported spending extensive time on screens post-COVID-19⁷. A study conducted among Chinese university students to correlate mental and psychosocial health during the COVID-19 pandemic revealed 15.5% anxiety, 23.3% depression and 30.8% clinically relevant post-traumatic stress disorder⁸. Another study focusing on Asian university students across multiple countries (China, Bangladesh, etc.) found that over 33% of students experienced some level of anxiety during lockdowns⁷.

Recognizing the pivotal role of physical activity in mental well-being, especially in the current pandemic context, is imperative⁹. The WHO defines physical activity as “Any bodily movement produced by skeletal muscles that require energy expenditure”^{8, 10}. Physical activity diverts an individual’s attention from stressful life events, which leads to improved mental health⁹⁻¹¹. When it comes to pupils who abstained from physical activity exhibited a high prevalence of depression (62.24%), paralleled by heightened anxiety (61.95%)¹². The COVID-19 pandemic has limited physical activity in people of all age groups¹⁰⁻¹³. The pandemic’s impact on physical activity globally is underscored by a recent study, revealing an average 12% reduction in step counts across the United States since March 2020¹⁴.

While knowing the relationship between mental health, physical exercise, and screen usage in students during lockdowns is critical, research in this area is scarce. This study intends to fill that vacuum by looking into the impact of screen usage and physical exercise on mental health among students at the Medical University of Peshawar. Existing research indicates a link between screen usage, physical activity, and mental health, but additional research is needed, particularly on students during lockdowns in areas such as Peshawar, Pakistan. This study will add crucial information to an understudied area.

Methodology

Study Design and Setting

This cross-sectional survey was conducted at the Institute of Physical Medicine and Rehabilitation (IPM&R), Khyber Medical University, Peshawar, from March 2021 to August 2021.

Target Population

A total of n=232 students enrolled in the study from the university through a non-probability, convenience sampling technique.

Inclusion Criteria

Undergraduate students aged 17 to 28 years studying under allied health sciences programs at the university have attended online classes for a minimum of 2 months using electronic devices like laptops, mobile phones, tablets, etc., for more than 2 hours¹⁵.

Exclusion Criteria

Individuals with diagnosed cognitive issues and limited physical activity from trauma within three months days (e.g., muscle strain, ligament sprain) and those with health conditions deemed unsafe for physical activity (e.g., amputation)¹⁶.

Data Collection Procedure

The research was approved by the university's Ethical Review Board. An electronic survey link was generated and sent to the students through social media platforms such as WhatsApp and Facebook, and consent was taken from those respondents who agreed to participate and fill out the following questionnaires:

- ***The Screen Time Questionnaire***

This questionnaire measures the average amount of time spent on five distinct screen activities: online classes, using social media, remote work, gaming and watching videos on a smartphone, television, computer, and tablet¹⁸.

- **International Physical Activity Questionnaire (IPAQ)**

The time spent engaging in vigorous and moderate physical activity, walking, and sitting was calculated using a brief IPAQ. The following MET (Metabolic Equivalents) criteria were used to categorize the results into high, moderate, and low categories¹⁹:

- Participants who had a 1-599 MET score were considered low/mild physically active.
- If the MET score of the participants ranges from 600-2999, they were considered moderately physically active.
- Those who had 3000 or above METMET were considered highly physically active.

MET of 3.3 for walking, 4 for moderate physical activity and 8 for vigorous physical activity.

- **DASS-21 (Depression, Anxiety, Stress)**

The mental state was assessed using the DASS-21 (Depression, Anxiety, and Stress) scale. Each of the three categories contains seven elements in total, which are then divided into seven scales. Participants were asked to rank each item on a scale of 0 (did not apply at all) to 3 (applied to me very much), with 3 representing the highest score. The melancholy, anxiety, and stress values were combined to yield a total score, which was then multiplied by two²⁰.

Data Analysis

The data analysis was executed with SPSS version 22 (Statistical Package for the Social Sciences). Frequencies and percentages were determined for the study variables. Contingency tables (cross-tabs) were used to investigate the relationship between physical activity, screen time, depression, anxiety, and stress, and the correlation between the variables was assessed using the chi-square test of association.

Results

The total number of n=232 participants enrolled in this study, out of which 156 (67%) were females and 76 (33%) were males, 39 (16.81%) were of age 19 years or less, 111 (47.84%) of age 20 to 23 years and 82 (35.34%) participants of age 24 years or greater. Out of total participants, 173 (74.60%) were from Doctor of Physical Therapy, 18 (7.80%) from Occupational Therapy, 28 (12.10%) from Speech-Language Pathology, 5 (2.20%) from Audiology and 8 (3.40%) from Prosthetics & Orthotics respectively. Amongst these students, 64 (27.60%) were from 1st year, 44 (19%) in 2nd year, 43 (18.50%) in 3rd year, 28 (12.10%) in 4th year and 53 (22.80%) in 5th year respectively. Whereas 6 (3%) participants were married, and 226 (97%) participants were unmarried. 4 (1.72%) of the participants had low socioeconomic status, 226 (97%) had medium socioeconomic status, and 3 (1.29%) had high socioeconomic status, respectively 33 (14.20%) participants were underweight, 179 (77.20%) were normal, and 20 (8.60%) were overweight, respectively.

Correlation between Anxiety Levels and Screen Time

A significant correlation ($p < 0.05$) existed between anxiety levels and screen time. About $n=25$ participants with mild anxiety, only 5 had high screen time, $n=23$ participants with moderate anxiety, 10 had high while 4 had very high screen time. Amongst 22 participants with severe anxiety, 4 had high and 1 had very high screen time, whereas $n=95$ participants with extremely severe anxiety, 30 had high, and only 3 had very high screen time. Moreover, 67 participants had normal anxiety levels.

Anxiety Levels	Screen Time of Participants				Total	P-value
	Very Low	Low	High	Very High		
Normal	10 (4.3%)	41 (17.7%)	16 (6.9%)	0 (0.00%)	67 (28.9%)	0.001
Mild	1 (0.4%)	19 (8.2%)	5 (2.2%)	0 (0.00%)	25 (10.8%)	
Moderate	2 (0.9%)	7 (3.0%)	10 (4.3%)	4 (1.7%)	23 (9.9%)	
Severe	1 (0.4%)	16 (6.9%)	4 (1.7%)	1 (0.4%)	22 (9.5%)	
Extremely Severe	4 (1.7%)	58 (25.0%)	30 (12.9%)	3 (1.3%)	95 (40.9%)	

Correlation between Stress and Physical Activity Levels

A significant correlation ($p < 0.05$) existed between stress and physical activity levels. Those with high physical activity predominantly exhibited normal stress (37.1%). Mild stress was observed in 15% of participants with varying activity levels. Moderate stress (38%) included 12% low, 20% moderate, and 6% high physically active participants. Severe stress (26%) involved 6% low, 10% moderate, and 10% highly physically active participants.

Stress Levels	PA Levels of Participants			Total	P-value
	Low	Moderate	High		
Normal	29 (12.5%)	38 (16.4%)	19 (8.2%)	86 (37.1%)	0.043
Mild	3 (1.3%)	5 (2.2%)	7 (3.0%)	15 (6.5%)	
Moderate	12 (5.2%)	20 (8.6%)	6 (2.6%)	38 (16.4%)	
Severe	6 (2.6%)	10 (4.3%)	10 (4.3%)	26 (11.2%)	
Extremely Severe	17 (7.3%)	41 (17.7%)	9 (3.9%)	67 (28.9%)	

Discussion

This study focused on the impact of screen time and physical activity on stress, anxiety, and depression in Khyber Medical University's IPM&R students. However, there was no significant association between screen time and the level of depression. Another study showed that playing computer games does not hinder young people's psychological prosperity since it has social and emotional advantages. Besides, it is contended that playing computer games is among the best ways for teenagers to produce good sentiments and reduce depression. The findings were comparable with our results as the screen time questionnaire includes time spent in the form of the screen, either studying online or playing games²¹. A study revealed heightened negative emotions with increased screen time, accounting for a 9% variation. Gender showed no significant impact on mental health, aligning with Yang et al.²². In the meta-analysis, the association of depression with screen time was assessed in adolescents and pre-adolescent children. The risk of depression was increased to 12.3% in those using screens daily. Higher ST values indicate a higher association with increasing depression²³. Magson et al.²⁴ gathered information from 248 Australian adolescents aged 14 years, indicating a noteworthy rise in depression and anxiety coupled with a decline in life satisfaction during the initial two months of the pandemic.

There was no association between depression and physical activity in this cross-sectional survey. A study showed that, after controlling sedentary behavior and other confounding factors, participants who spent 15+ hours per week for recreational physical activity had a probability of being depressive as compared to their other partners who spent 0-0.9 hours per week for physical activity. There is evidence that physical activity was contrarily connected with depression²⁵. On the contrary, a study showed that physical activity can be a powerful tool for promoting mental well-being and reducing depressive symptoms. They investigated that the individuals who worked out 3 to 5 times each week had fundamentally more significant decreases in depression²⁶.

In this cross-sectional survey, there was a significant correlation between anxiety and screen time. Another research demonstrates similar results that high screen time exposure (>2 hours/day) alone brought about 6.8%, 9.2% and 16.3% increase for the prevalence of anxiety, depression and school life disappointment in comparison with low exposure (<2 hours/day)²⁷. In contrast, a study discovered that there was no obvious evidence of a relationship between times spent staring at the TV or messaging at age 16 and anxiety²⁸.

There was no association between anxiety and physical activity, as the findings of this study reported. A study with competitive athletes showed that high-intensity resistance training may increase anxiety, i.e. both men and women reported increased anxiety after 20 minutes of high-intensity exercise²⁹. Contrarily, numerous systematic reviews and meta-analyses have found that exercise helps lessen the signs and symptoms of anxiety. Participants who achieved 600 to 6,000 METs-min/week had a lower anxiety risk than the sedentary group (0-600 METs-min/week)³⁰.

The findings of this study showed no significant association between stress levels and screen time. According to a study, around 30% of the sample considered themselves as screen-dependent. Most of the sample, 44.6%, reported ongoing stress but no screen dependence. The results of this study were comparable to our findings³¹. A study that contrasts with ours found that overall, 51.4% of students experienced stress during times of illness based on data analysis i.e. 78.5% of students said they disliked taking lessons online and stress levels had increased due to their online studies³².

There was a significant association between stress and physical activity levels. The literature supported this association; 72.8% of respondents had higher stress associated with lesser physical activity or exercise, which was comparable to our study results³³. Students who engage in low to moderate physical exercise are the likelier to feel stressed. Similar results were reported by Vankim and Nelson³⁴, who noted that students who engaged in active PAPA did not express less stress.

Strengths & Limitations

This study investigated how screen use and physical activity during lockdown affected students' mental health. The findings emphasize early health promotion and exercise training during home quarantine. This information can help to shape future health promotion initiatives during health emergencies. Recall bias is a possible restriction, as students had to remember physical activity and screen time while on lockdown. Although a reliable WHO-approved questionnaire (IPAQ-S) was utilized, self-reported physical activity data may be less exact than pedometer readings. Furthermore, the study concentrated on younger students, which may have impacted the findings' generalizability. Another limitation was that individuals with pre-existing mental health issues like OCD and ADHD were included in the research, which might have skewed the results.

Future Recommendations

A longitudinal survey with detailed subjective assessment is recommended to deduce more appropriate results using DASS. As this study was conducted through an electronic survey, the participants did not have a chance to ask questions in case of any ambiguity so that perception error could occur. Moreover, awareness campaigns may be carried out in future for people with mental disorders, helping them improve their quality of life.

Conclusion

The findings showed a significant positive correlation between anxiety and screen time and a negative correlation between stress and physical activity. It was found that there was an insignificant correlation between depression, screen time, and physical activity.

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Conflict of Interest

None.

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None.

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AUTHORS' CONTRIBUTION

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

Conception or Design: Ayaz I, Shabbir R

Acquisition, Analysis or Interpretation of Data: Ayaz I, Shabbir R, Hakimullah

Manuscript Writing & Approval: Ayaz I, Shabbir R, Hakimullah

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.



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