International Journal of Yoga, Physiotherapy and Physical Education
www.sportsjournal.in
ISSN: 2456-5067
Received: 29-09-2025, Accepted: 29-10-2025, Published: 13-11-2025
Volume 10, Issue 4, 2025, Page No. 61-65

Correlation of screen time and quality of life among physiotherapy students

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Abstract
This study aimed to find the correlation of screen time and quality of life among physiotherapy students using the SF-12 questionnaire. A total of 150 students who met the inclusion and exclusion criteria took part in the study. Physical (PCS) and mental (MCS) component scores were analyzed based on daily screentime. The average screen time of the participants was about 5–6 hours per day. Since the data were not normally distributed (as per the Shapiro-Wilk test), non-parametric tests were used for analysis. Spearman's correlation showed no significant relationship between screen time and PCS or MCS. When screen time was divided into low, medium, and high groups, the Kruskal-Wallis test showed no difference in PCS scores but a slight difference in MCS scores. Chi-square analysis showed no link between PCS and screen time, but MCS showed a significant association, suggesting that higher screen use may affect mental health. The study concludes that while physical health was not affected by screen time, longer screen exposure may lower mental well-being. These results highlight the need to promote healthy screen habits among physiotherapy students to maintain better mental and overall health.

Keywords: Screen time, quality of life, SF-12, physiotherapy students, mental health, physical health

Introduction
In today's world, smart phones have evolved into essential tools that cater to numerous aspects of daily life. These devices are not only used for communication but also serve a wide array of functions such as entertainment, social media engagement, information access, GPS navigation, and professional applications. The widespread adoption of smart phones is evident from the fact that in India alone, there are more than 950 million users [1, 2]. Standard screen time for adolescents is less than 2 hours [3].
Mobile devices are rapidly emerging as primary sources for accessing medical information, particularly among younger healthcare professionals and those in training [4]. However, despite the numerous advantages technology offers, it also comes with potential drawbacks. This raises the question: "What are the downsides of technological advancements?
Technology Acceptance Model (TAM) provides a framework for understanding why people readily adopt smart phones. Smart phones possess attributes such as portability, trendiness, versatility, customization, and user-friendliness, which contribute to their perceived usefulness and ease of use. These factors make smart phones more appealing and accessible compared to other electronic devices [5, 6].
Excessive screen time and problematic social media use can negatively impact mental health, self-perception, and personal relationships. Studies have linked these habits to increased rates of depression, anxiety, body dissatisfaction, and eating disorders [7]. Moreover, the sedentary lifestyle often associated with high screen use may diminish the overall quality of life, affecting physical, psychological, and social well-being [8].
Study of 2019 International Journal of Environmental Research and Public Health reported that college students spend an average of 8 to 10 hours daily on their smart phones. Medical students face significant stress from the very start of their studies, making them particularly susceptible to sleep deprivation. If these students are also addicted to smart phones, it could exacerbate theissue and lead to even poorer sleep quality. A study conducted in Africa found that graduate students who excessively used smart phones experienced higher levels of procrastination, distraction, lower academic performance, and reduced grammatical and linguistic accuracy. Additionally, smart phone users reported significant anxiety and cognitive delays when separated from their devices.
Furthermore, studies conducted in various Indian states have shown that a significant proportion of medical students, ranging from 34% to 40%, exhibit signs of smartphone addiction [9, 10, 11, 12].
Excessive screen time may correlate with poor eating habits, weight issues, sleep disturbances, and physical discomfort. Screen-based activities can potentially decrease time spent on physical exercise. Females, particularly in their youth, might face higher risks due to generally lower activity levels and more time spent in sedentary pursuits. The amount of sedentary behaviour is a key health indicator. Reducing inactivity and increasing physical movement can help prevent weight gain [13, 14, 15].
Additionally, mobile phone use has been linked to general discomfort, feelings of unwellness, nausea, muscle pain, forgetfulness, and fatigue [17]. A specific study focusing on female medical students found that smart phone use primarily affected their memory, sleep, and concentration, which could negatively impact their academic performance [18] Despite the extensive use of smart phones among physiotherapy students. There is an opportunity for more research to be conducted on the potential health issues associated with this usage. This could help us better understand and address any challenges that may arise.
The SF-12 health related quality of life. The SF-12 is a self-reported outcome measure assessing the impact of health on an individual's everyday life. It is often used as a quality of life measure. The SF-12 is a shortened version of its

predecessor, the SF-36, which itself evolved from the Medical Outcomes Study. The SF-12 was created to reduce the burden of response. The SF-12 uses the exact eight domains as the SF-36; Limitations in physical activities because of health problems, Limitations in social activities because of physical or emotional problems, Limitations in usual role activities because of physical health problems, Bodily pain, General mental health (psychological distress and well-being), Limitations in usual role activities because of emotional problems, Vitality (energy and fatigue), General health perceptions [19].

We are using the DASS scale to rule out the depression, anxiety, and stress levels among students. The DASS-21 is the short form of the DASS-42, a self-report scale designed to measure the negative emotional states of depression, anxiety and stress [20, 21] There are three components of the scale: Depression scale, Anxiety scale, Stress scale.

Therefore, our research aims to find the effect of screen time usage on quality of life among physiotherapy students.

Need for Study

Excessive screen usages can lead to problem in social – emotional development including physical inactivity, sleep disturbance, anxiety & depression that will affect quality of life of students.

Several studies conducted on medical students who frequently use smartphones have identified potential health risks associated with their usage. These risks include headaches, disrupted sleep patterns, reduced concentration, impaired short-term memory, skin irritation, brain tumors, and high blood pressure [16].

The device like smartphones, tabs and computers, has been associated with negative effects on mental health, social interactions, and quality of life. Studying the impact of screen time on quality of life is crucial as digital devices are increasingly integrated into daily life.

Understanding these impacts can help us to form guidelines to make healthy screen habit and to form intervention if needed to improve quality of life of students.

Aim

To assess the correlation of screen time and quality of life among physiotherapy students.

Objective

1. To assess the screen time among physiotherapy students
2. To assess quality of life by using SF-12 among physiotherapy students.
3. To study the correlation of screen time and quality of life among physiotherapy students.

Materials and Methods

In total, 150 undergraduate physiotherapy students from TMV's Lokmanya Tilak College of Physiotherapy participated in this correlational study. Convenient sampling was used to select participants, and Demographic data and DASS-21 were taken. Participants who full fill the inclusion criteria were included in study and the SF-12 HRQOL questionnaire was given.

The data is statistically analysed using Microsoft Excel.

Inclusion criteria

Physiotherapy students (I-IV year)

Exclusion criteria

If they refused to participate in the study.

Physiotherapy Interns

DASS21 as a screening tool if score is- Depression>4, anxiety>3, stress >7.

Had any health problem that temporarily or permanently prevented participation in physical activity.

Used any type of medication that could induce changes in the study variables (e.g., opioids or antidepressants).

Outcome Measures

Health-related quality of life (HRQoL) SF-12.

Depression Anxiety Stress Scales - Short Form (DASS-21).

Procedure

Approval was taken from the Institutional Ethics Committee of TMV'S Lokmanya Tilalk College of Physiotherapy, Kharghar.

The purpose and the procedure of the study was clearly explained o the participants and the informed consent was taken with consideration of inclusion and exclusion criteria. Demographic data and DASS-21 were taken. Participants who full fill the inclusion criteria was included in study and the SF-12 HRQOL questionnaire was given. The data is statistically analysed using Microsoft Excel .

Data Analysis and Results

Descriptive Statistical analysis was done of the data collected using Microsoft Excel.

The data collected was statistically analyzed and is presented in the form of pie charts, box plots and bar graphs. A total of 150 responses of physiotherapy students were collected.

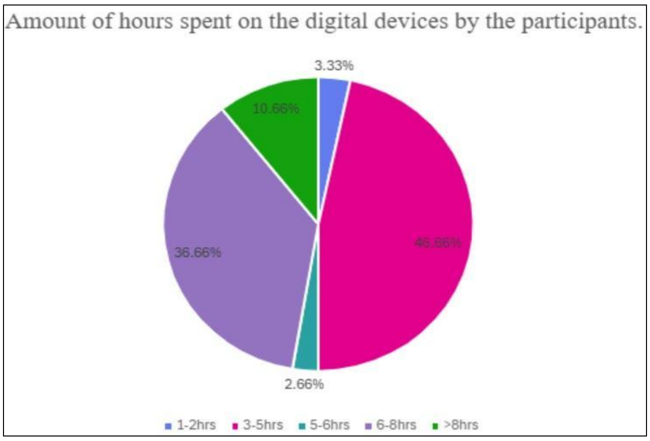
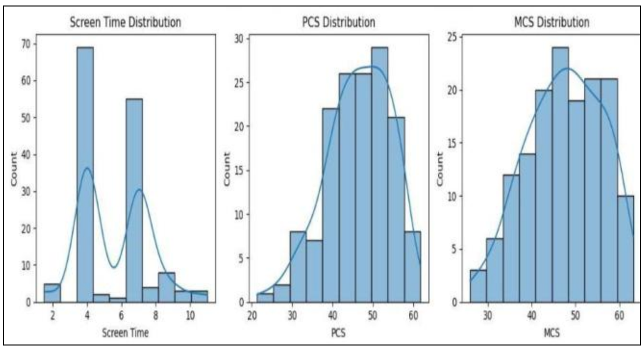
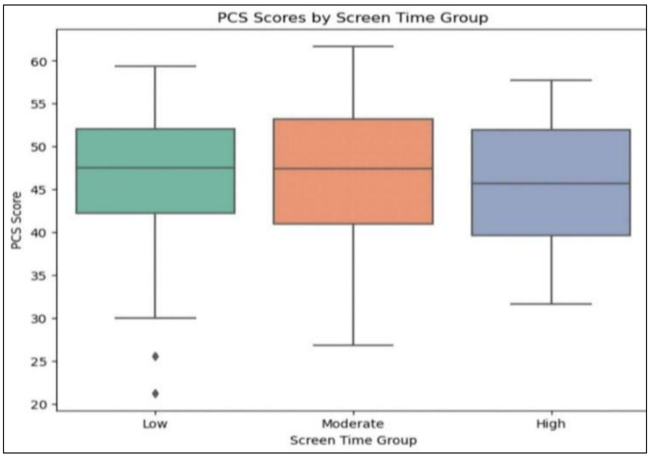


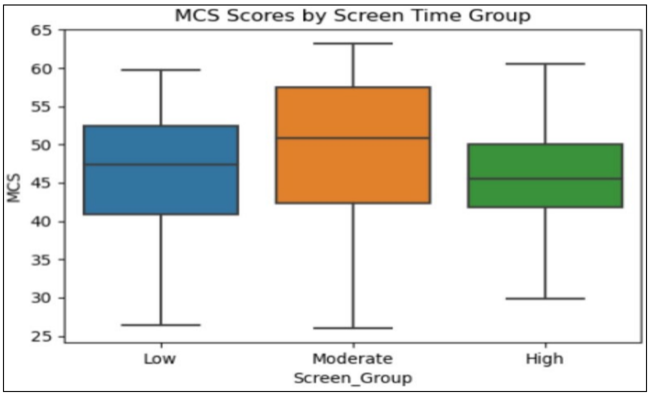
Chart 1: represents the number of hours spent on digital device by participants



Graph 1, 2, 3: shows the distribution of data with relation to screen time, PCS and MCS respectively



Box Plot 01: Comparison of Physical Component Scores (PCS) Across Different Screen Time Groups. Shows how physical health scores vary among participants with low, moderate, and high screen time



Box Plot 02: Comparison of Mental Component Scores (MCS) Across Different Screen Time Groups "Shows how mental health scores vary among participants with low, moderate, and high screen time

Discussion

This study aimed to assess the correlation between screen time and quality of life among physiotherapy students using the SF-12 questionnaire. A total of 150 students participated after meeting the inclusion and exclusion criteria. Data were analyzed for physical component scores (PCS) and mental component scores (MCS) in relation to daily screen time. The SF-12 is a well- established tool used to measure both physical and mental health, and its subscales have shown good reliability (Cronbach's alpha = 0.70–0.89) [22].

The data showed that most physiotherapy students spend several hours daily on digital devices, with an average screen time of 5–6 hours per day. This reflects the common use of devices for both study and personal activities in student life.

The Shapiro-Wilk test was used to check whether the data followed a normal distribution. Screen Time (p=0.000), PCS (p=0.005), and MCS (p=0.021) did not follow a normal distribution. Because of this, non-parametric tests, such as Spearman's correlation and Kruskal-Wallis test, were used for analysis.

Spearman's correlation showed no significant association between screen time and PCS (r=0.008, p=0.925) or between screen time and MCS (r=0.084, p=0.307). This indicates that the number of hours spent on devices does not have a direct linear relationship with physical or mental health scores.

Screen time was then divided into three groups: low (<5 hours), medium (5–8 hours), and high (>8 hours). The Kruskal-Wallis test found no significant differences in PCS scores between these groups (H=0.014, p=0.993). For MCS scores, there was a borderline difference (H=5.429, p=0.066) [24]. This suggests a trend where students with higher screen time may have lower mental health scores, although the difference was not strong.

Chi-square analysis was used to look at categorical outcomes. There was no significant association between PCS <50 and screen time (χ^2=3.99, p=0.407). However, MCS <50 showed a significant association with screen time (χ^2=6.05, p=0.048). This means students who use devices for long hours are more likely to have lower mental health scores.

The graphs and tables of the study helped visualize these results. For example, the box plot of MCS scores across the three screen time groups showed that the median mental health score tended to be lower in the high screen time group. Similarly, the scatter plot for Spearman's correlation confirmed that there was no clear linear relationship between screen time and PCS or MCS. These visual representations support the statistical findings and make it easier to see the trend that mental health may be more affected than physical health.

The findings of this study highlight a growing concern regarding digital habits among physiotherapy students. With the increasing integration of technology into academic and social life, extended screen exposure has become almost unavoidable. However, prolonged screen time may lead to adverse effects such as digital fatigue, sleep disturbances, and decreased physical activity all of which can negatively influence overall quality of life. The observed negative correlation between screen time and quality of life aligns with previous studies indicating that excessive use of digital devices is linked to poorer mental well-being, reduced social engagement, and diminished life satisfaction among students.

Interestingly, while moderate screen use may be necessary for learning and communication, excessive use tends to blur the boundary between academic productivity and digital overuse. Physiotherapy students, in particular, may experience higher screen exposure due to online classes, research work, and social networking, further affecting their balance between physical and psychological health. The mindful technology use could help improve the quality of life and academic performance of health science students

The results also emphasize the importance of self-regulation and awareness regarding technology use in professional education. Since physiotherapy students are future healthcare providers, maintaining their own well-being and modelling healthy digital habits is essential. Institutions can play a key role by incorporating wellness programs, counselling, and time-management training into their curriculam. Future research could explore longitudinal effects of screen exposure, considering factors such as stress levels, sleep quality, and academic workload to gain a deeper understanding of how digital behaviour patterns influence holistic well-being in healthcare students.

The study found no significant correlation between screen time and overall QOL among physiotherapy students. But it did show that higher screen time is statistically significant to mental health scores. These results highlight the importance of monitoring daily device use and taking steps to support mental health in students.

Conclusion

This study assessed the relationship between screen time and quality of life among physiotherapy students using the SF-12 questionnaire. The findings showed that most students spend an average of 5–6 hours daily on digital devices. Statistical analysis did not find a significant correlation between screen time and overall quality of life. Physical health scores (PCS) were not affected by screen time. However, mental health scores (MCS) showed a significant association, where students with longer screen time were more likely to have lower mental health outcomes.

Therefore, the study concludes that physical health is not significantly correlated with screen time, but mental health is significantly correlated with higher exposure of screen time. These results highlight the need for awareness about healthy screen use and the importance of balancing academic and recreational screen activities to maintain better mental well-being among students.

Acknowledgements

The Author would like to extend a sincere gratitude to all the participants, principal and faculty members of the Department of Physiotherapy, TMV's Lokmanya tilak college pf physiotherapy, Navi Mumbai for their support and cooperation.

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