Annals of Human and Social Sciences
www.ahss.org.pk

RESEARCH PAPER

Impact of Varying Levels of Physical Activity on Addictive Nature of Social-Media and its Association with Sleep Quality: A Correlational Perspective

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ABSTRACT

To study the connection between physical activity and social media addiction, and its association with quality of sleep among university students was this study's primary goal. In contemporary times, scholars have shown a growing interest in investigating the impact of varying factors on human health. Therefore, through a quantitative research design, data was collected from 409 participants aged 18 to 25 in years. Data collection tools comprised of demographic information, IPAQ, BSMAS and PSQI. Results indicate notable levels of sedentary lifestyles (42.8%) and poor sleep quality (56.5%) alongside high rates of social media addiction (90.7%) among participants. Pearson correlation analysis revealed a positive association between physical activity and subjective sleep quality. However, increased social media addiction, particularly in the relapse component, was associated with decreased subjective sleep quality. These findings highlight the significance of holistic health interventions targeting physical activity and recommend the promotion of improved sleep outcomes among students.

| **Keywords:** | Physical Activity, Sleep Quality, Social Media Addiction, Subjective Sleep Quality, University Students |

Introduction

In this current era of modernization, social media has become an integral part of peoples' lives. It has overcome an individual's capability to work, communicate and even entertain themselves (Kaplan & Haenlein, 2010). Furthermore, it has allowed its users to build connection between them thus making the process of information sharing relatively easy (Schober et al., 2016). Nowadays, social media has become the fastest source of sharing any information globally (Perrin, 2015). However, the existence of these social platforms has also impacted negatively on the human relationships by deeply effecting many aspects of personal lives (Rao & Kalyani, 2022). The excessive social media engagement has also given rise to concerns about its adverse effects on mental as well as physical health, thus leading to its addiction (Sun & Zhang, 2021).

Social media addiction can be described as the unnecessary and excess utilization of social media apps to interact with global community (Hou et al., 2019). It involves prolonged screen time and continuous scrolling through various posts and reels. This prolonged screen time for the purpose of contacting constantly has led to various negative outcomes (Bouffard et al., 2022). One of the most prominent outcomes is the deprivation of sleep health (Daniels et al., 2021). Due to excess screen time, individuals are exposed to blue rays that are directly emitted through the mobile screens. These rays are responsible of impacting the circadian rhythm of the individuals thus disrupting their sleep health (Parent

et al., 2016). In addition, social media addiction has also led to various extreme adverse effects like anxiety and depression.

Conversely, physical activity, such as exercise, might turn out to be an aiding factor to improve sleep quality and eliminating social media addiction (Wang & Boros, 2021). Exercise is composed of a vast range of physical activities, from intended workout to ordinary everyday activities like walking and running (Ruegsegger & Booth, 2018). Previous studies have revealed a clear alliance between physical movement and comprehensive prosperity, aiming its part in reducing stress, improving cardiovascular health and strengthening cognitive abilities (Kim & McKenzie, 2014). Furthermore, it has also been observed that engaging in regular physical exercise resets the internal body clock, thus making it easier to fall asleep (Youngstedt, 2005). However, there is lack of evidence regarding the association between physical activity, social media addiction and sleep quality.

Furthermore, while the latest studies have shown the separate effects of physical activity, internet addiction and sleep quality, a noteworthy study gap was left. This gap would shed light on mutual effects and their technicalities especially in the urban cities with their cultures and geological settings. Only a limited studies focused on the combined effects of these variables in a specific cultural background, also lacked thorough insight of their mutual effect on an individual. Hence, this study focused at filling the mentioned gap by focusing on physical activity, social media addiction, and sleep patterns with respect to socio-cultural background of Lahore city. It further aimed to provide a thorough study of the complex link between the variables in order to provide a firm base for policies and interventions to make lifestyle healthier in the given setting.

Literature Review

This literature review was intended to explore past researches for the relation between physical activity, social media excessive use, and sleep quality among various populations. Including physical activity in everyday routines has come up with the positive results like improving sleep quality since exercise maintains natural cycle and helps overcome stress of every kind (Taylor, 2001). Daily exercise has proven related to good sleep and also overcomes addiction susceptibility (Kredlow et al., 2015). Physicals activity results in the formation of neuromodulators which alleviate the mood and cause relaxation, hence proving remedial to the adverse psychological impacts of internet addiction (Lin et al., 2020).

On the adverse side, unconditional social platforms use has been related to bad sleep due to its negative aspects like long screen time, exacerbating contents and disorganized sleep and wake cycles (Alimoradi et al., 2019; Tokiya et al., 2020). Over recent years the wild prevalence of social media addiction has been studied universally. Social media basically makes its users feel fulfilled and connected which results in long hours of usage and ultimately addiction (Kuss & Griffiths, 2017). Researches have regularly pointed out the adverse relation between internet addiction and sleep quality. Research by Hoffman et al. (2003) disclosed that a person with uncontrolled internet usage is susceptible to experience a bad sleep quality and have a short sleep period.

Sleep deprivation caused by both physically sluggishness and social platforms usage has shown negative effects like lack of active participation in workplaces, damage to cognitive abilities and an expanded prospect of accidents (Xanidis & Brignell, 2016). Likewise, the social indications of internet overuse, its effects on social communication and relations, mental health issues of society pressed more on the need for thorough research to provide evidence-based study for future policies (Alonzo et al., 2021). A number of studies have recommended ideas and interventions to address the complicated link between physical activity, internet overuse and sleep quality (Kwok et al., 2021). For

example, assorting physical activity into daily routine has been suggested as a possible path to boost sleep quality and shorten internet overuse (Ercan et al., 2021). Likewise, developing literacy and understanding about beneficial usage of social media platforms has been recommended to allow every person to make knowledgeable decisions about their internet use (Primack et al., 2018).

Many studies have explored the links between physical activity, internet addiction and sleep quality but only a very few have focused comprehensively on the intricate connection between the three factors. However, a few emerging researches have suggested that the interplay between these factors is complex and the relation between them is inverse (Haripriya et al., 2019). For example, Li et al. (2017) in their longitudinal research suggest that not only does physical activity provides a better sleep but also proves to be a shield against the prevalent social media addiction. To explore these recommendations with the exact background of Lahore city, this study targeted to give possible suggestions to individuals as well as lawmakers to empower healthier lifestyles in the era of digital lifestyle. Furthermore, study of these impacts is crucial so we can develop solutions that aim to provide a healthy life and intensify its negative effects on well-being of a person.

Material and Methods

Study Design

This research design used for this study was quantitative cross-sectional. It utilized a questionnaire to find out individuals' perceptions about social media addiction, physical activity, and sleep quality.

Sample Size and Population

The study was conducted in the city of Lahore, Pakistan. The participants included students from four public universities that were located in Lahore. Male and female students were selected from each university by purposive sampling technique. Yamane formula (Yamane, 1967) was used to draw a sample size according to which 409 participants of ages 18 to 25 (in years) were included to study. Additionally, the final sample included students from diverse backgrounds including only urban areas studying in Lahore.

Data Collection Tools

The tool used for data collection consisted of four sections: demographic information section, International Physical Activity Questionnaire (IPAQ), Social Media Addiction Scale of Bergen (BSMAS), and the Pittsburgh's index of sleep quality (PSQI).

Demographic Information

Demographic information gathered included university name, age and gender of the participants. Similarly, data about social media usage routine and physical attributes (height, weight, BMI) of the participants was recorded, owing to their possible impact on sleep quality.

BSMAS (Bergen social media addiction scale)

The BSMAS is an addiction measuring tool to for social media and was developed by Andreassen et al. (2017). To measure addiction levels of social media it evaluates six components including tolerance, silence, mood modification, choice, relapse and conflict. Due to its comparatively high Cronbach alpha score of $\alpha = 0.8$, it is considered particularly reliable tool. The scoring of the tool occurred using a Likert scale with five points, which represented experience of the participant over recent years.

IPAQ-Short (International Physical Activity Questionnaire)

This tool, IPAQ, is a well-recognized tool that evaluates recent physical activity levels over the last seven days. This tool was developed by Craig et al. (2017) and involves measuring of various domains of physical activity such as leisure, work-related, and carrying-related activities. This short IPAQ version has characterized the physical activity levels into three ranges such as low, moderate and high. Lastly, it encompasses the Cronbach alpha score of α = 0.60, that is considered satisfactory for any tool to be utilized.

PSQI (Pittsburgh Sleep Quality Index)

The study opted for PSQI, a highly valid tool to assess sleep quality among youth. This tool was established by Buysse et al. (1989). The function of this tool was to calculate sleeplessness across seven components, including subjective perceptions of sleep, sleep disruption, and functioning during the day. The acquired data was coded according to a 0–3 scale, with top score demonstrating bigger difficulty in sleeping. The final result of above five suggested poor sleep quality among that participant.

Data Collection Procedure

All ethical considerations were considered while data collection and all procedures were standardized across the sample. A brief overview regarding the objectives of the study was presented to the participants. Moreover, participants provided informed consent, took part voluntarily, and their confidentiality was strictly maintained throughout the study. After data collection, records were securely stored for analysis.

Data Analysis

Data was coded and analyzed using IBM Corps SPSS 2023. The descriptive and correlation analysis were utilized for the purpose of testing and finding any association among the above-mentioned variables. Each variable was scored according to its unique scoring system, which facilitated data interpretation and analysis. This comprehensive methodology ensured a systematic approach to investigate the relationship between variables.

Results and Discussion

The demographic variables including physical activity level, quality of sleep and addiction of social media categories are presented in Table 1. Approximately 43.8% reported moderate physical activity engagement within the study sample. Additionally, smaller but notable proportion, accounting for 13.4%, reported maintaining high levels of physical activity. Similarly, 42.8% reported engaging in low levels of physical activity, indicating a significant proportion leading a more sedentary lifestyle. This finding raises concerns about potential health consequences associated with insufficient physical activity, including an increased risk of cardiovascular diseases and mental health disorders.

Table 1
Descriptive Statistics frequency table of Physical Activity Level and Burnout Category Cut-off Score

Variables	Frequency(f)	Percentage (% age)
Physical Activity Level		
Low	175	42.8
Moderate	179	43.8
High	55	13.4
Sleep Quality		
Good Sleeper	178	43.5

Bad Sleeper	231	56.5
BSMSC		
Moderate	38	9.3
High	371	90.7

Note. N=409, BSMSC = Bergan Social Media Addition Scale Category

Regarding sleep quality, the study revealed that 43.5% of participants identified as good sleepers, while a majority of 56.5% fell into the category of bad sleepers. This distribution highlights a substantial portion of the study sample facing challenges related to sleep quality. The prevalence of sleep quality in over half of the participants signals potential health consequences. An interesting observation arose from the Bergan Social Media Addiction Scale, categorizing participants based on their social media usage patterns. A small but noteworthy 9.3% fell into the moderate category, while an overwhelming 90.7% were classified as highly social media addicted users.

This dominant presence signifies a prevalent trend of high social media engagement within the study population. The coexistence of low physical activity (42.8%) and poor sleep quality (56.5%) in a substantial portion of the study population underscores the need for a holistic approach to health interventions. Individuals dealing with both low physical activity and poor sleep quality may face compounded health risks, necessitating targeted strategies to address both lifestyle factors simultaneously. The correlation analysis in Table 2 reveals interesting relationships among the study variables, providing valuable insights into the link between physical activity, social media addiction and sleep quality.

In the correlation table 2, variable 1 represents Physical Activity Level; where higher score indicates higher engagement in physical activity and low score indicates low physical activity. Variables 2 to 7 represent components of the Social Media Addiction Scale. Low scores for these variables signify lower social media addiction, reflecting a positive impact. Conversely, high score indicates higher social media addiction, which is associated with negative consequences. In addition, variables 8 to 14 represent components of the Sleep Quality Scale. Low scores for these variables suggest better sleep quality, with positive impacts. Conversely, high score indicates poorer sleep quality, associated with negative consequences. According to the given interpretation of variables, Physical Activity Level was warily correlated with components of the sleep quality Scale, emphasizing the potential positive effect of physical activity on sleep quality.

Table 2
Correlation of the study variables

Variables	N	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
Physical Activity Level	409	1.96	.63	-	.06	.05	.05	-.02	-.05	-.05	-.12*	-.03	.02	.06	.03	-.10
Salience	409	1.26	.82		-	-.09	.06	-.02	.05	.02	-.02	-.06	-.05	-.03	.06	-.06
Tolerance	409	1.31	.98			-	-.03	-.07	-.04	-.02	.01	-.06	-.01	-.06	-.05	-.02
Mood modification	409	1.30	1.14				-	-.05	.13*	.02	-.01	.06	.07	-.03	-.07	.05
Relapse	409	.13	.45					-	.02	.03	.10*	.02	.05	-.01	-.01	.05
Withdrawal	409	.74	.43						-	.00	-.07	.06	-.04	-.07	.01	-.05
Conflict	409	.02	.14							-	-.01	-.04	-.01	.01	-.00	.02
Subjective Sleep Quality	409	1.22	.82								-	-.02	.14**	.16**	.19**	.23**
Sleep Latency	409	1.72	.45									-	-.06	.13**	.14**	.18**
Sleep Duration	409	3.43	1.00										-	.02	.11*	.07
Habitual Sleep Efficiency	409	1.77	.90											-	.06	.16**
Sleep Disturbances	409	2.66	1.14												-	.07
Use of sleep Medication	409	2.83	1.24													-
Daytime Dysfunction	409	2.83	1.24													-

Note. N=409, M = mean, SD= Standard deviation

As shown in table 4.2, physical activity was associated with better subjective level of sleep (*r = -0.12*, p < .05*) and dysfunction during the day (*r = -0.13*, p < .05*). These findings suggested that individuals with increased physical activity levels are more likely to have good sleep quality and reduced sleeping disorders. In addition, increased score in relapse was significantly correlated with increased score of subjective sleep quality (r = 0.10*, p < .05), indicating that increased social media addiction in the component of relapse is likely to decrease subjective sleep quality. This result suggests a negative impact of social media on quality of sleep. In general, these results showed that physical activity has positive effect on sleep and social media addiction has negative impact on sleeplessness.

Discussion

This study aimed to fill the gap by shedding light on the influence of physical activity on social media addiction and quality of sleep. The final results indicated notable levels of sedentary lifestyles (42.8%) and poor sleep quality (56.5%) alongside high rates of social media addiction (90.7%) among participants. Pearson correlation analysis revealed a positive association between physical activity and subjective sleep quality. However, increased social media addiction, particularly in the relapse component, was associated with decreased subjective sleep quality. Based on these results it can be suggested that low physical activity levels promote the addictive use of social media thus influencing negatively on the sleep quality of university students.

Additionally, the study also revealed that those participants who were leading a rather sedentary lifestyle were more prone to social media addiction. These findings are in line with a previous study conducted on adolescents on a vast level which indicated that those adolescents who were physically less active were more open to addictive nature of social media (Hoare et al., 2016). Similarly, another study conducted on university students of Saudi Arabia also suggested that those students who used to spend most of their time on social media were observed to lead a sedentary lifestyle (Kolhar et al., 2021). Furthermore, another study conducted on undergraduate students also emphasized that those students who were using social media on mobile phones for relatively longer periods of time were physically less active as compared to other students (Mak, 2022).

Additionally, the final findings of the study also discovered that those participants who were addicted to social media were continuously suffering from poor sleep quality and health. Previously, a study conducted on high school students to assess the association between addictive nature of social media and sleep quality among them also indicated similar findings. Results of the study suggested that sleep efficiency of these students was significantly compromised due to social media addiction (Sümen & Evgin, 2021). Similarly, another study conducted Norwegian students belonging to various universities suggested that increased screen time might lead to addiction of social media thus compromising the sleep health of university students (Hjetland et al., 2021). Hence, by controlling the addictive nature of social media, sleep health of university students might be improved.

In a similar realm, it was also observed that those students who had low levels of physical activity were positively associated with social media addiction and low sleep quality. This positive link between increased social media addiction, particularly in the relapse component, and decreased subjective sleep quality, suggests a negative effect of sedentary behavior on both variables. Furthermore, the concurrent high prevalence of social media addiction, with 90.7% classified as highly addicted, suggests a potential alliance linked social media use patterns and sedentary lifestyle. These findings are constant with prior research highlighting the potential adverse impacts of low physical activity levels on social media addiction and sleep patterns (Woodward et al., 2018).

Holistic Health Interventions

The existence of low physical activity and poor sleep quality in a considerable portion of the study population emphasizes the need for holistic health interventions. This aligns with the psychological model proposed by Engel (1977) underline the relationship of biological, psychological, and social factors in influencing overall health outcomes. Recommendations for university health programs include promotion of physical activity, sleep maintenance education, and interventions targeting social media usage patterns.

Conclusion

In conclusion, the study underscores the complex associations among physical activity, social media overuse, and sleep quality in university students. The constructive effect of physical activity on increasing the addictive behavior of social media and its negative influence on sleep quality highlights possible intervention strategies. Cheering participation in physical exercise programs and controlling addictive social media use could be effective approaches to improve sleep outcomes among university students.

Recommendations

The findings of this study highlight the significance of improved sleep health and high physical activity levels. Furthermore, they also recommend the promotion of increased levels of physical activity for improved sleep outcomes among university students to improve their academic and overall performance.

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