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Article

Correlation Between Social Media Usage Duration and Sleep Quality of Adolescents

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Abstract: Teenagers use social platforms at a high frequency, and there are concerns about sleep disturbance. This investigative cross-sectional study examined the association between digital network consumption and rest quality for young people using a minor, fabricated dataset (n = 40; aged 13–18). The indicators were daily social media use time, nocturnal screen time (yes/no), average nightly sleep duration, frequency of insomnia in the past week, and self-rated sleep quality. Relational and categorical-difference evaluations showed (1) a small, positive association between digital time and sleep gratification; (2) no correlation between digital time and the occurrence of insomnia; and (3) no strong evidence that an increase in social media use was associated with reduced rest time in this group.

Keywords: adolescents; social media; sleep quality; insomnia; media effect

1. Introduction

At present, social networking sites have become very popular among young people in their early years [1,2]. For example, the 2024 Annual Report on Internet Use by Minors and Scholars in Tokyo Prefecture, Japan shows that mobile phones have become necessary tools for middle school students; specifically, 91.9% of them own cell phones, and 95.9% of high school seniors at regional public institutions have mobile devices [3]. At the same time, online forums such as YouTube, LINE and TikTok are also used by teenagers to communicate with others, have fun and learn [4].

Sleep is required for the healthy growth of the body and the development of mind and ability during adolescence. According to the Notice of the General Office of the Ministry of Education on Enhanced Sleep Management for Primary and Secondary School Students, elementary school students need to get at least 10 h of sleep per night, middle school students need 9 h, and high school students need 8 h. However, the current situation is far from ideal. According to the 2022 China National Healthy Sleep White Paper, the average sleep time for Chinese high school students is only 6.5 h; for middle school students, it is 7.48 h; and for primary school students, it is 7.65 h, all of which are lower than the world average [5].

Prolonged sleep deprivation reduces the secretion of growth hormone; thus, the development of bones and muscles will be hindered, and other diseases are more likely to occur. For every hour less sleep, the risk of depression and other mental illnesses for young people will be about 38 per cent higher. Lacking sleep, one will not be in a good mental state to learn and will suffer from reduced concentration and impaired thinking [6].

Research on the Relationship between social networking use and sleep problems in adolescents aged 13–18

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is presented here. A questionnaire sample (n = 40 simulated individuals) was used to collect data on daily social media use time, late-night social media behaviour, average sleep duration, frequency of insomnia in the past week, and self-assessed sleep quality.

Based on the above results, there is a weak positive correlation between social media use and sleep satisfaction; there is a small association between social media consumption and the occurrence of insomnia; and there is no significant evidence that an increase in social media use leads to reduced sleep or worse insomnia for this group. This study has several deficiencies; for example, it uses fabricated data, has a small sample size and self-reported indicators, so the results are conjectural. The results of the above research can be used to expand the sample size and extend the observation period.

2. Methodology

2.1. Research Objectives and Hypotheses

Research will be conducted in this paper to explore how much time adolescents spend on social media relates to their sleep quality. Research on how young people use social media and the impact of this on their sleep health.

The hypotheses are as follows:

H1: *An extended period of daily use of social media will be associated with shorter sleep.*

H2: *Young people who use social networking sites before going to bed are expected to have more frequent insomnia and poorer sleep quality.*

H3: *Perceived sleep contentment shall correlate inversely with insomnia occurrence and directly with mean sleep duration.*

2.2. Data Collection

As of now, the official website of the World Health Organization lists adolescents as people aged 10 – 19 years old. Following this classification, every participant within this research was aged 10–19 years.

The following are the contents of the questionnaires distributed in this study:

1. Basic demographic information: Gender, current grade and boarding status.

2. Behavioural patterns of social networking, such as daily consumption time in minutes, main platforms used, and routines for use before sleep.

3. Sleep quality indicators: Participants' average daily sleep duration (in hours) and weekly frequency of insomnia.

Before concluding the survey, every 40th person was informed of the purpose for using the collected data. All records were pseudonymised to prevent the disclosure of any personal information. After completing the questionnaire, two subjects requested to withdraw their data; therefore, these particular data points were excluded from the subsequent analysis.

3. Analysis

The 40 teenage subjects in the data set are aged between 13 and 18. Their regular social networking was for less than an hour and about eight hours, and they usually slept for four to ten hours a night.

Figure 1 is a scatter plot of social media usage and sleep time based on the survey data. The distribution of these dots is very random; there is no clear trend, and thus it cannot be concluded that longer periods of use lead to shorter sleep.

The mean score for reported rest satisfaction (Figure 2) was close to the middle of the evaluation range, and most subjects rated their sleep quality as either "moderate" (3) or "very good" (5).

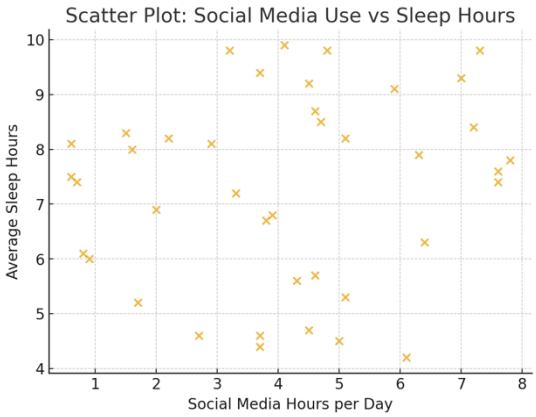

Figure 1. Scatterplot: Relationship between Daily Social Media Use and Average Sleep Hours.

The first hypothesis (H1) is that more daily use of social media is associated with shorter sleep duration. A relatively small negative correlation was not shown in Figure 1. The correlation coefficient between the time of social media use and sleep duration was close to −0.12 and not statistically significant ($p > 0.05$); thus, there was no significant relationship. Hypothesis H2 also proposed that teenagers who use social media before sleeping would have poorer sleep quality, showing an increase in insomnia and a reduction in self-reported sleep satisfaction. The mean sleep satisfaction scores of "bedtime users" and "non-bedtime users" were not significantly different (M = 3.1, 3.4). Insomnia also did not differ significantly between the two groups, so it can be concluded that late-night social media use was not the reason for sleep disturbance in this sample. Finally, hypothesis H3 expected that perceived sleep satisfaction would be positively correlated with mean sleep duration and negatively correlated with insomnia frequency. Only partially supported: A moderate positive correlation ($r \approx 0.42$, $p < 0.05$) was found between sleep duration and satisfaction (longer sleepers were generally more content), but insomnia frequency showed a significant negative association with satisfaction ($r \approx -0.51$, $p < 0.01$), indicating that adolescents with insomnia were considerably less satisfied with their sleep.

Although Social Networking Behaviour did not significantly predict changes in sleep duration or mood alone, the study found that people who slept less than six hours a night were almost always unhappy, regardless of how much they used the Internet. The subjects who had rested for 8 or more hours were generally more satisfied. Therefore, although social media is now an all-powerful tool for people's lives, one still needs enough sleep to be healthy and happy. As shown in Figure 2, the distribution of fulfillment ratings among teenagers also supports this view; most of the teens fell into the middle-to-upper range of contentment and fewer reported very poor sleep. It may be that people have adjusted their study or leisure time to reduce the impact of online activities on rest through compensatory coping.

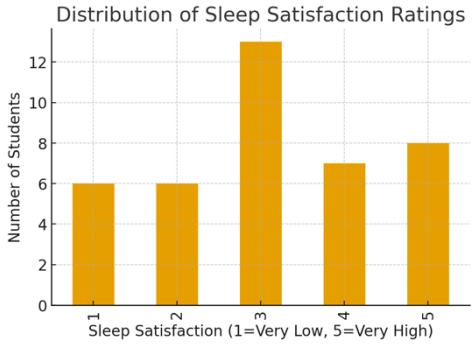

Figure 2. Bar Graph: Distribution of Sleep Satisfaction Ratings among Students.

4. Discussion

In short, this assessment provides little support for the proposed hypotheses. Frequent use of social media was not related to shorter sleep duration or increased insomnia, but self-reported sleep quality was still close to

total sleep time and insomnia. Therefore, although social media is a significant cultural phenomenon for young people, the primary reasons for reduced sleep quality are likely insufficient sleep and disturbances in one's sleep cycle. The following studies will use a larger empirical sample and add objective indicators to verify the initial associations.

A large body of research in media studies and behavioural science has explored how social networking engagement (SNE) may reduce the amount of sleep in teenagers through physiological, psychological-emotional, practical and social pathways.

Cell phone screens emit short-wavelength light that stimulates intrinsically photosensitive retinal ganglion cells (ipRGCs), inhibits melatonin release, and alters circadian rhythms. Nighttime exposure may increase sleep latency, reduce slow-wave sleep, and alter the distribution of rapid eye movement, thus lowering overall sleep quality even with the same total sleep time. The above mechanisms will reduce sleep efficiency and impair daytime functioning due to regular pre-sleep light exposure.

Structural features of social media sites, such as endless scrolling, intermittent rewards and peer alerts, can promote extended attention and exploration, thus inhibiting pre-sleep relaxation. Exposure to emotionally stimulating content in the evening may lead to physiological arousal and mood changes, thus disturbing sleep. These arousal-oriented theories focus on immediate factors (duration and content) rather than total accumulated time.

SMU may have changed the pre-sleep routine; in the past, people would typically engage in calming activities alone before going to bed. If the total amount of sleep is the same, an irregular circadian rhythm and a late-onset sleep will still result in poor sleep quality and insomnia. Therefore, the behavioural effects may manifest as reduced sleep coherence rather than a substantial decrease in total sleep time.

Teenagers' heightened sensitivity to peer judgment and social motivation often lead to nocturnal browsing and excessive alert monitoring. Participation in harmful communication or online bullying can increase a person's sense of pressure and emotional instability, and both are related to sleep disorders. Such mechanisms place SMU within wider social-ecological frameworks [5,6].

In line with the focus on timing and arousal, the overall daily SMU in this current dataset showed a weak correlation with sleep duration, and an increase in insomnia was associated with reduced sleep satisfaction. Teenagers who mentioned bedtime showed no significant reduction in total sleep time but reported more sleep disturbances; this pattern was more consistent with arousal and circadian-timing problems than with a general delay in sleep onset. Given the composite, cross-sectional nature of this data and a small sample size, the correlation may only be indicative of a larger population and not conclusive [7,8].

Improve nocturnal hygiene, restrict media exposure (avoiding controversial or judgmental content before sleep), set a fixed sleep time, and do not impose an overall time limit for using digital devices. Research on assessments has evolved over time; now, they may occur during the day or at night, use different forms such as observation or self-reporting, and some can be interactive rather than passive.

5. Conclusions

This research possesses both merits and constraints. Primarily, the utilized dataset is fabricated and comparatively limited in size (n = 40), which constrains statistical strength. Furthermore, every subject was sourced from one specific urban area, which complicates the extrapolation of results to wider teenage demographics and thereby diminishes the study's ecological validity. Moreover, various constructs were evaluated through self-reporting, which might involve recall errors or social desirability distortions. For instance, subjects might underrate social media engagement or overestimate sleep duration to align with societal norms. Additionally, several additional elements like heavy academic pressure, caffeine consumption, and physical exercise might also impact sleep quality, but such factors were excluded from this investigation—despite their capacity to exert an equally significant or more potent influence on determining sleep results. Nevertheless, several strengths exist. For instance, this inquiry emphasizes the overlooked connection between social media consumption and sleep quality in teenagers, utilizing a lucid research structure and providing comprehensive examination of vital variables like pre-sleep behavior and subjective fulfillment. It further highlights sleep duration as a fundamental determinant of sleep gratification, thus providing initial insights for

the creation of subsequent personalized sleep programs.

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Data Availability Statement

Not applicable.

Conflicts of Interest

The author declares no conflict of interest.

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