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RESEARCH PAPER

Digital Nights: A Study on Social Media Habits and Sleep Disorders among Pakistani University Students

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ABSTRACT

This study investigates the relationship between social media use and sleep quality among Pakistani university students, considering gender and residential variations. With the growing use of digital platforms, sleep disruption has emerged as a public health concern. Social media engagement before bedtime is increasingly linked to poor sleep health and emotional imbalance. A quantitative research design was adopted using simple random sampling. A total of 300 students (150 males and 150 females) from three public universities in Faisalabad participated. Data were collected using the Social Media Use Index, Social Media Addiction Scale, and Pittsburgh Sleep Quality Index. Statistical tools such as correlation, ANOVA, chi-square, and regression were used for analysis. Findings showed no significant relationship between overall or nighttime social media use and sleep quality. However, emotional engagement with social media was significantly associated with sleep disturbances among both genders. The study suggests promoting digital literacy and awareness campaigns to encourage healthy online habits and emotional regulation.

KEYWORDS Digital Media (Social Media) Use, Sleep Quality, Youth, Gender, Emotional Engagement, Uses and Gratifications Theory

Introduction

Concerns regarding digital media (social media)'s detrimental impacts on people's general health are growing as its use increases. Numerous studies have established a link between excessive digital media (social media) use and a number of detrimental health impacts. Examples include sleep disorders. (Bhat, et al., 2018), Increased risk of self-destructive behavior (Barthorpe, et al., 2020; Muzaffar, et. al., 2019), increased symptoms and concerns linked to eating disorders. (Santarossa & Woodruf, 2017), Declining academic performance (Leyrer-Jackson & Wilson, 2018) and diminished mental health (Vannucci, Flannery, & Ohannessian, 2017; Awan, et. al., 2018).

The rapid increased use of online media among youth, especially in developing countries like Pakistan, has led to significant health risks, the most serious of which is sleep disruption. Studies consistently show a strong relationship between prolonged late night or overuse of digital media (social media) platforms and sleep quality (Bhat, et al., 2018), together with delay in sleep, insomnia and low duration of sleep (Woods & Scott, 2016). Youth participation in Pakistan is increasing towards platforms like YouTube and Facebook and gender differences in usage patterns are clearly visible (Kemp, 2025). Despite these growing concerns, limited studies have inspected the link between use of digital media (social media) and sleep disturbances in young Pakistanis, only students of

physiotherapy students of Lahore were studied (Azhar, Shahzadi, & Fatima, 2021). Even fewer studies have examined potential gender differences in these associations.

More use of digital media (social media) is linked to bad sleep health (Bhat et al., 2018), and poor sleep quality affects the relationship between digital media (social media) use and deteriorating mental health, according to numerous studies and reviews (Muzaffar, et. al., 2020; Vernon, et al., 2017) However, limited research has directly compared the relationship between regular digital media (social media) usage, night use of digital media (social media) before sleep, and sleep quality outcomes. Investigating this difference could be key to agreeing with the link between time of using digital media (social media) and poor sleep quality. Research found that use of digital media (social media) in bedtime alone (not general use of digital media (social media) use) affecting sleep quality in youth (Exelmans & Scott, 2019), Woods and Scott (2016) observed that night time and general social sites usage, both are affecting quality of sleep among adults. No research has yet examined the potential link between emotional engagement in digital media (social media) and good sleep in young adults.

Quality of sleep and mental health status are significantly correlated, according to several research. Numerous empirical investigations have shown a strong correlation between poor sleep-quality and bad mental health (e.g., anxiety, stress, depression) (Massetti, et al., 2017; Vernon, et al., 2017; Wickham, et al., 2020). The DSM-5 lists insomnia and sleep disturbances as symptoms of depressive and anxiety disorders (American Psychiatric Association, 2013). Poor sleeping, i.e. sleep deprivation is defined as sleeping under six hours per night (Asghar et. al., 2025; Grandner, et al., 2010), is linked with a number of outcomes: short-attention span, decision making problems, emotional dysregulation, lower motivation, mood swings, increased stress, and a higher chance of depression (Grandner et al., 2010; Owens, 2014; Salam, et. al. 2024).

In summary, further work is needed to differentiate among general digital media (social media) use, nighttime digital media (social media) engagement, and the concept of sleep health., and to extend the findings to self-control deficits on digital media (social media), emotional engagement in online networking, and healthy sleep, especially in young adults. Considering these varied and limited results, additional work is essential to explore the differences in the middle of overall and nighttime online social network usage and their impact on sleep quality, particularly among various age demographics. Studies consistently show a positive correlation between bad sleep health and online cravings.

This study is designed for the investigation of general usage patterns of digital media (social media) among Pakistani youth, to explore the relationship between general usage of digital media (social media), night digital media (social media) engagement, and the incidence of sleep disorders, and to analyze variations between genders' digital media (social media) usage and its effects on sleep health.

Research Questions

RQ1-What are the general trends of social media usage for Pakistani youth?

RQ2-Is there a significant relationship between nighttime social media use and the prevalence of sleep disorders among young people?

RQ3-Are there notable gender variances while social media is affecting sleep disorders?

RQ4-How does the duration and timing of digital media (social media) use affect sleep-quality in both genders?

RQ5- How social media use affects sleep-quality among hostelized students and non-hostelized?

Hypotheses

Based on objectives, questions, and literature, the study hypothesized that:

H1-Nighttime social media use is positively associated with higher levels of sleep disturbances among young people.

H2-The effects of social media use on sleep disturbances differ significantly by gender.

H2a-Females are estimated to report more sleep problems related to their emotional involvement in social media.

H2b-Men experience more stress due to increased nighttime use.

H3-Prolonged and late use of social media and bad sleep in both genders have significant relationships.

H3a-Nighttime social media use is strongly associated with bad sleep than general social media use.

H3b-The effect of the timing and duration of social media use on sleep health varies by gender.

H4-It is estimated that students living in hostels suffer more from sleep disorders related to social media use than students living at home.

Literature Review

Sleep quality means to a person's satisfaction with every aspect of his/her sleep. It is set on four main characteristics: Sleep efficiency, sleep time, sleep duration, and the number of times a person wakes up after falling asleep. Several factors affect sleep quality, including age, circadian rhythm, BMI, and physiological factors such as the amount of REM and slow-wave sleep. Psychological factors, such as stress, anxiety, and depression, also play a role. In environmental factors, use of television or electronic devices and room temperature can affect sleep quality. Additionally, family and social factors have a potential role in the quality of sleep (Nelson, et al., 2022).

Matricciani et al. (2024) highlights the important link b/w daily activities and sleep duration. Considering sleeping as part of your daily routine can help you make better lifestyle and sleep better. DelRosso (2025) highlighted that there are differences in sleep health between population groups with their demographics (gender, socioeconomic status, and geographic region). In addition, poor sleep is associated with many serious health problems, including heart disease, obesity, metabolic diseases such as diabetes, and an increase in mental disorders such as anxiety and depression. This underlines the importance of sleep as a modifiable risk factor for public health, with better sleep quality potentially improving overall health (Massetti, et al., 2017; Vernon, et al., 2017; Wickham, et al., 2020).

Bhatt et al. (2018) indicate that using electronic devices before bedtime is one of the main factors contributing to poor sleep quality. In their study, participants were given the option to read a printed or digital book for four hours before bedtime, while exposed to light, for 5 nights. The findings showed that individuals who have e-books slept less at night. taht short sleep, had higher primary melatonin production, a delayed circadian rhythm, and were sufficiently alert the following morning contrast to those who were with a paper book.

Several studies have linked increased digital media (social media) use to poor sleep quality. The association between digital media (social media) use and mental health problems may be influenced by poor sleep quality (Vernon, et al., 2017). Few research, however, explicitly assesses how using digital media (social media) at night, particularly right before bed, affects the quality of sleep. Comprehending this distinction may help clarify how digital media (social media) usage timing affects sleep. For example, one study found that poor sleep quality in adults was associated with digital media (social media) use, particularly at night (Exelmans & Scott, 2019), but another study found that poor sleep quality in adolescents was associated with both general and nighttime use (Woods & Scott, 2016). According to a more recent study by Zhong et al. (2025), daily screen use is linked to later bedtimes and causes a weekly sleep loss of about 50 minutes. People with a history of nocturnal insomnia are more likely to experience sleep deprivation as a result of social jet lag, which is the mismatch between their natural sleep habits and their social obligations. These results imply that screen time's detrimental effects on sleep are not exclusive to kids and teenagers. To create successful solutions, further research is required.lter

Research showed that young people in Riyadh spend more than six hours a day in front of a screen. Nearly half of them suffer from sleep disturbances, daytime fatigue, drowsiness, and difficulty concentrating. (Alshoaibi, et al., 2023). A similar study conducted among MBBS students at Rawalpindi Medical University found that excessive screen time deteriorates sleep quality and leads to various physical and psychological problems (Arshad et al., 2021).

More work is need to be done for clarification of this role that night and general use of digital media (social media) on sleep quality and to explore how factors such as gender, living status of young students (hostelaized or non-hostelized) and emotional engagement on digital media (social media) especially in Pakistani youth context may affect sleep, especially in young adults.

The uses-gratification theory is the most widely used to explain this phenomenon why people interact with media. Elihu Katz and his colleagues, first proposed this theory in 1973, has been used to study the reasons why people use media to satisfy their needs. The fundamental principle of uses and gratifications theory rests on the idea that individuals actively seek out, from a wide range of media content, that meets their specific needs and provides them with satisfaction. This theory emphasizes that media consumption is not a passive process, but a conscious and deliberate approach, motivated by the individual's desire to satisfy specific social, emotional, and psychological needs. When people use variance media platforms, they do so to obtain satisfaction that align with their personal goals and preferences. This satisfaction can be seeking information, entertainment, social interaction or emotional catharsis (Alshoaibi, et al., 2023).

Many studies in this field have repeatedly shown that the satisfaction people get from using media plays an important role in predicting their usage habits and influencing their continued and repeated interaction with media content. These studies have shown the complicated relationship between media use, desired gratification and factors that come up with repeated media use (Kaye & Johnson, 2002).

In his work in, McQuail presented a comprehensive taxonomy of uses and gratifications for overall media use, containing five different categorizations followed by being informed or educated, "identifying with the characters in the media environment" escaping from stress, for interaction with others and entertainment. These media need to shed light on the motivations that drive individuals to use different platforms. Mentioned above classification offers meaningful understanding into the various emotional social, and psychological needs that people see to fulfill by their media usage (McQuail, 2010).

According to Leung and Wei (2000), after analyzing the use and satisfaction of mobile phone users, the following results were obtained: socialization, entertainment, fashion, mobility, psychological well-being, and instant access are some of the motivations that drive people to use this emerging communication technology.

This study concentrated on two particular frameworks from the body of literature on frameworks for examining uses and gratifications: McQuail (2010) and Leung and Wei (2000). Three common elements emerge from an analysis of these frameworks: amusement, social engagement, and information seeking.

Material and Methods

Nature

This study's research technique is based on a quantitative approach, which is defined by methodical and structured approaches to data gathering, analysis, and interpretation. Using this quantitative framework, the researchers sought to collect numerical data that could be statistically analyzed.

Population

To gather pertinent information, students from the public universities in Faisalabad the National Textile University Faisalabad (NTU), the University of Agriculture Faisalabad (UAF), and Government College Faisalabad (GCUF) studied. The selection of these colleges provides a useful framework for examining young people's usage patterns of digital media (social media). Additionally, the participation of both men and women allows for a comprehensive analysis of gender differences in digital media (digital media (social media)) use and its probable effects on sleep health.

Sample size

Out of all the students at the three universities, 300 people were randomly selected to take part in the study. To attain a gender balance, each university had 100 participants, 50 men and 50 women.

Sample collecting technique

The participants were chosen using a straightforward random sample procedure to ensure representativeness and fairness.

Instrument

Four primary measurement scales were among the organized and validated instruments utilized to accomplish the research objectives and successfully test the hypotheses. a) General trends in youth participation in digital media (social media) were evaluated using the five-item Digital media (social media) Use Frequency Scale (Perez, et al., 2021). This scale tracks usage on various platforms on a daily and weekly basis. b) To study the link b/w digital media (social media) use and sleep disorders, particularly about nighttime use, a comprehensive tool called the adapted seven-item scale on digital media (social media) use in bed was used. Each item on the scale encourages participants to reflect on their habits, for example, how often they check their digital media (social media) accounts before going to bed or while in bed (Bhat, et al., 2018). c) To assess problematic usage patterns, the Digital media (social media) Addiction Scale of Bergen (Andreassen, et al., 2012) was used. This six-item scale aims to measure the main symptoms of behavioral addiction, including prevalence, mood changes, tolerance, withdrawal, conflict, and relapse. d) Sleep quality was assessed using the Pittsburgh Sleep Quality Index (Buysse et al., 1989). This 24-item, seven-component scale measures sleep disturbances, sleep duration, sleep habits, subjective sleep quality, sleep latency, sleep aid use, and daytime dysfunctions. out of 24 items, 19 were self-reported and 5 were completed by a spouse or partner, if available. For this study, only self-reported questions were used to assess sleep quality. The elements of scale are grouped into seven, each ranging from 0 (no problems) to 3 (severe problems).

Pilot testing

A pilot study was conducted with a small group of participants (30) (who were not part of the main group) to ensure the clarity, reliability, and validity of the questionnaires.

Validity and reliability

All the measurement instruments used in the study were standardized and had been previously validated in similar research contexts (Andreassen, et al., 2012; Bhat, et al., 2018; Buysse et al., 1989; Perez, et al., 2021). The reliability coefficients (Cronbach's alpha) of the scales were evaluated and found to be within acceptable limits, thus ensuring internal consistency. The pilot study further supported the validity of the instruments in a Pakistani university context with **α = .689.**

Ethical considerations

Ethical principles were respected throughout the study. Participants were informed of the study's objective and assured that their participation was voluntary. The confidentiality and anonymity of the responses were guaranteed and the data collected were used exclusively for educational purposes.

Data analysis technique

Descriptive statistics including frequencies, percentages, and mean usage time were used to analyze the data, with further breakdowns by gender and residency (hostel vs. non-hostel) presented through cross-tabulations and charts. The relationship between addiction level and sleep quality was examined by using statistical examination i.e the chi-square test, two-way ANOVA and t-test to identify gender-related differences.

Results and Discussion

Table 1
Digital media (social media) usage frequency by gender

Gender		Frequency	Percent
Male	Light	1	.7
	Moderate	39	26.0
	Heavy	110	73.3
	Total	150	100.0
Female	Light	1	.7
	Moderate	55	36.7
	Heavy	94	62.7
	Total	150	100.0

Table 1 shows the position of digital media (social media) usage frequency (categorized as Light, Moderate, and Heavy users) by gender. Among males, the majority (73.3%) are heavy digital media (social media) users, followed by 26.0% moderate users, while only 0.7% fall in the light usage category. A similar pattern is observed among females, though with a slightly lower proportion of heavy users (62.7%) and a higher proportion of moderate users (36.7%); light users again represent only 0.7% of the female group. Both male and female groups have the same total number of respondents (n = 150), indicating a balanced sample size for gender comparison. This suggests that while heavy digital media (social media) use is prevalent for both genders, it is relatively more dominant among males, whereas moderate use is comparatively more common among females.

If it comes to the difference of hostel and non-hostel students, table 2 presents male hostel residents, the majority (73.0%) are heavy digital media (social media) users, followed by 25.7% moderate users, while only 1.4% are light users. A similar trend is observed among non-hostel males, with 73.7% heavy users and 26.3% moderate users, and no representation in the light usage category. For female hostel residents, heavy users make up 62.5% of the group, while 37.5% are moderate users, with no light users recorded. Among women those having living status as non-hostel, heavy use (62.8%) remains the most frequent, followed by moderate use (35.9%) and a small proportion of occasional users (1.3%). In general, heavy digital media (social media) use is widespread among both sexes and in all types of housing. Men, whether they live in residences or not, have slightly higher rates of heavy use than women, while moderate use is relatively more common among women.

Table 2
Digital media (social media) usage frequency by gender and resident status

Gender			Frequency	Percent
Male	Hostel	Light	1	1.4
		Moderate	19	25.7
		Heavy	54	73.0

		Total	74	100.0
	non-hostel	Moderate	20	26.3
		Heavy	56	73.7
		Total	76	100.0
Female	Hostel	Moderate	27	37.5
		Heavy	45	62.5
		Total	72	100.0
	non-hostel	Light	1	1.3
		Moderate	28	35.9
		Heavy	49	62.8
		Total	78	100.0

Table 3
Overall digital media (social media) usage frequency

Digital media (social media) Usage	Frequency	Percent
Light	2	.7
Moderate	94	31.3
Heavy	204	68.0
Total	300	100.0

The overall trend shown in Table 3 indicates that the majority of respondents are frequent digital media (social media) users, representing 68% of the total sample. Regular users constitute 31.3%, while occasional users represent a very small proportion (0.7%). This suggests a high level of interaction with digital media (social media) among participants: most dedicate a significant amount of time to it, and only a few use it occasionally.

Tables 1, 2, and 3 show that young people in Pakistan have a high level of interaction with digital media (social media). The majority of the sample—more than two-thirds (68.0%) of respondents—use digital media (social media) extensively. Sporadic use is rare (less than 1%), although moderate use is reported by over one-third (31.3%).

In terms of gender, both men and women are classified as frequent users; however, moderate use is more common among males (26.0%) than among women (36.7%). Additionally, the style of housing (hostel vs. non-hostel) indicates that both groups continue to have a tendency toward excessive consumption. 73.0% of males who live in hostels and 73.7% of men who do not live in hostels exhibit this excessive consumption.

For females, heavy usage is slightly lower—62.5% for hostel residents and 62.8% for non-hostel residents—yet still the majority. Moderate use remains higher among females regardless of residence, whereas light use is minimal in all categories.

Overall, findings indicate that digital media (digital media (social media)) become an essential part of Pakistani youth's lives, with a strong inclination toward heavy use, modest levels of moderate engagement, and very limited light usage. This trend is consistent across gender and residential status, though females exhibit a slightly greater tendency toward moderate use compared to males.

In response to RQ2 and H1 The Spearman's rho correlation test was applied in table 4.

Table 4
Spearman's rho Correlations between bedtime digital media (social media) use regularity and sleep quality

		Bed Time Digital media (social media) Use Regularity	Sleep Quality
Bed Time Digital media (social media) Use Regularity	Correlation Coefficient	1.000	.039
	Sig. (2-tailed)		.505
Sleep Quality	Correlation Coefficient	.039	1.000
	Sig. (2-tailed)	.505	

This revealed a very weak positive relationship (ρ = 0.039) between night use of digital media (social media) regularity and sleep quality among young people, with a p-value of 0.505, which above the 0.05. This shows that the association is not strictly significant, meaning that differences in bedtime digital media (social media) use do not meaningfully correspond to changes in sleep quality in the sample. Therefore, the results do not support **H1**, as no significant positive correlation was found between nighttime digital media (social media) use and higher levels of sleep disturbances. In response to **RQ2**, the findings suggest that nighttime digital media (social media) use is not significantly associated with the prevalence of sleep disturbances among young people in this study.

In response to Research Question RQ3, we have H2, H2a, and H2b hypotheses. To test H2, the Chi-Square Test of Independence was applied because the independent variable, gender, is a nominal variable (male and female), and the dependent variable, sleep quality, is an ordinal variable (very good, fairly good, fairly bad, very bad).

Table 5
Chi-Square Tests: association between gender and sleep quality

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.088[a]	1	.297		
Continuity Correction[b]	.860	1	.354		
Likelihood Ratio	1.089	1	.297		
Fisher's Exact Test				.354	.177
Linear-by-Linear Association	1.085	1	.298		
N of Valid Cases	300				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 68.50
b. Computed only for a 2x2 table

In table 5 Chi-Square Test of Independence was conducted to examine whether there is a significant association between gender (male, female) and sleep quality (very good, fairly good, fairly bad, very bad). The results show that the Pearson Chi-Square value is 1.088 with 1 degree of freedom and an Asymptotic Significance (2-sided) value of 0.297, which is greater than the conventional significance threshold of 0.05, indicating that the relationship is not statistically significant. The Continuity Correction, applied due to the 2x2 nature of the table, yielded a similar non-significant p-value of 0.354, further confirming the result. The Likelihood Ratio (1.089, p = 0.297) also supports the same conclusion. Furthermore, Fisher's exact test, particularly useful with small sample sizes or low expected frequencies, yielded a two-sided significance value of 0.354 and a one-sided significance value of 0.177, which are greater than the threshold value of 0.05,

thus confirming the finding of a significant relationship. The minimum expected count in the analysis was 68.50, and no cells had expected counts less than 5, indicating that the assumptions of the Chi-Square test were satisfied. Based on these results, it can be concluded that gender does not have a statistically significant relationship with sleep quality among the participants, meaning that variations in sleep quality are not meaningfully explained by gender differences in this sample. Consequently, hypothesis H2, which posited that the impact of digital media (social media) use on sleep disturbances differs significantly between male and female youth, is not supported.

Table 6
Pearson's correlation between emotional investment in digital media (social media) and sleep quality (Female; n=150)

		Emotional investment in digital media (social media)	**Sleep Quality**
Emotional investment in digital media (social media)	Pearson Correlation		.824**
	Sig. (2-tailed)		.000
Sleep Quality	Pearson Correlation	.824**	
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed)

Table 6 shows to test H2a, which proposed that females report greater sleep disturbances associated with their emotional investment in digital media (social media), a Pearson's correlation analysis was conducted between emotional investment in digital media (social media) and sleep quality scores among female respondents (N = 150). The results show a strong positive correlation of r = 0.824, with a significant value of p = 0.000, which is well below the conventional threshold of 0.01, indicating a statistically significant relationship. This means that greater emotional involvement in digital media (social media) is strongly associated with an increase in sleep disturbances in women. The positive direction of this correlation suggests that the greater the emotional involvement in digital media (social media), the lower the perceived sleep quality (in other words, sleep problems become more frequent). Given the strength of the correlation (greater than 0.80), this relationship is not only statistically significant but also concretely significant, which supports H2a and underlines that emotional attachment to social networks may play an important role in sleep problems among the young women in this study.

In the case of males table 7 show a strong positive correlation of r = 0.804, with a significant value of p = 0.000, which is well below the conventional threshold of 0.01, indicating a statistically significant relationship.

Table 7
Pearson's correlation between emotional investment in digital media (social media) and sleep quality (male; n=150)

	Emotional investment in digital media (social media)	**Sleep Quality**
Pearson Correlation		.824**

Emotional investment in digital media (social media)	Sig. (2-tailed)	.000
Sleep Quality	Pearson Correlation	.824**
	Sig. (2-tailed)	.000

**. Correlation is significant at the 0.01 level (2-tailed).

To test H2b, which posited that males report greater sleep disturbances related to increased nighttime digital media (social media) use, a Spearman's rho correlation (table 8) was conducted between bedtime digital media (social media) use regularity and sleep quality among male respondents (N = 150). The results indicate a very weak negative correlation (ρ = -0.039) with a significance value of p = 0.640, which is well above the conventional 0.05 threshold for statistical significance. This means that there is no meaningful or statistically significant relationship between nighttime digital media (social media) use and sleep disturbances in the male sample. The negative correlation coefficient, although extremely small, suggests a negligible tendency for higher bedtime digital media (social media) use to be associated with slightly better sleep quality, but this effect is so minimal and statistically non-significant that it cannot be interpreted as a genuine trend. Overall, these findings do not support H2b, indicating that, in this study, increased nighttime digital media (social media) use among males does not significantly contribute to variations in sleep disturbances.

Table 8
Spearman's rho correlation between bedtime digital media (social media) use regularity and sleep quality (male; n=150)

			Sleep Quality	**Bed Time Digital media (social media) Use Regularity**
	Sleep Quality	Correlation Coefficient		-.039
		Sig. (2-tailed)		.640
	Bed Time Digital media (social media) Use Regularity	Correlation Coefficient	-.039	
		Sig. (2-tailed)	.640	

In the case of female table 9 show the correlation coefficient is ρ = 0.137, indicating a weak positive relationship meaning that as bedtime digital media (social media) use regularity increases, sleep disturbances may slightly increase (i.e., sleep quality may worsen). However, the significance value (p = 0.095) is greater than the conventional threshold of 0.05, indicating that this relationship is not statistically significant.

Table 9
Spearman's rho correlation between bedtime digital media (social media) use regularity and sleep quality (female; n=150)

			Sleep Quality	**Bed Time Digital media (social media) Use Regularity**
	Sleep Quality	Correlation Coefficient		.137
		Sig. (2-tailed)		.095
	Bed Time Digital media (social	Correlation Coefficient	.137	

	media) Use Regularity	Sig. (2-tailed)	.095

To test H3, in response to RQ4 the Chi-Square Test of Independence was applied because of the independent variable, duration of using digital media (social media) (Light/Moderate/Heavy) and the dependent variable, sleep quality, both are ordinal variable (very good, fairly good, fairly bad, very bad).

Table 10
Chi-Square Tests: Association between duration of using digital media (social media) and sleep quality

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.329[a]	3	.507
Likelihood Ratio	2.327	3	.507
Linear-by-Linear Association	1.808	1	.179
N of Valid Cases	300		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 33.34.

In table 10 the results show a Pearson Chi-Square value of 2.329 with 3 degrees of freedom and an Asymptotic Significance (2-sided) of 0.507, which is well above the conventional 0.05 threshold. This indicates that there is no statistically significant association between the timing/duration of digital media (social media) use (as categorized) and sleep quality among the respondents. The Likelihood Ratio yielded the same significance value (p = 0.507), further confirming the result. The Linear-by-Linear Association test produced a value of 1.808 with a p-value of 0.179, which also fails to reach statistical significance. Assumption checks showed that all expected cell counts were above 5, with the minimum expected count being 33.34, indicating that the Chi-Square test conditions were met. Based on these findings, H3 is not supported, as neither the duration nor the timing of digital media (social media) use appears to have a significant relationship with sleep quality in the combined sample of both genders.

Table 11
Coefficients: Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.420	.199		12.155	.000
general daily use of digital media (social media)	.021	.060	.020	.346	.730
Bed Time Digital media (social media) Use Regularity	.030	.046	.038	.654	.514

a. Dependent Variable: Sleep Quality

Regarding H3a, which shows that the association between poor sleep quality and digital media (social media) use is stronger for nighttime use than for general daytime use, the results of the multiple regression analysis in Table 11 provide important information. The model used sleep quality as the dependent variable and included two predictors: general daily use of digital media (social media) and bedtime digital media (social media) use regularity. The constant term of 2.420 ($p < .001$) indicates the baseline sleep quality score when both predictors are at zero. For general daily use of digital media (social media), the unstandardized coefficient (B = 0.021) suggests a very minimal positive change in sleep quality scores for each unit increase in daily use, but this relationship is not statistically significant (p = .730). Similarly, bedtime digital media

(social media) use regularity shows a slightly higher unstandardized coefficient (B = 0.030), indicating a minor positive relationship with sleep quality scores, but again, the effect is statistically non-significant (p = .514). The standardized coefficients (Beta) reveal that nighttime use (.038) has only a marginally stronger association with sleep quality compared to daily use (.020), but this difference is negligible and not supported by statistical significance. These findings suggest that, contrary to the hypothesis, nighttime digital media (social media) use is not significantly more predictive of poor sleep quality than general daily use in this dataset.

Table 12
Spearman's rho Correlations between general daily digital media (social media) use and sleep quality by gender

Gender			General daily digital media (social media) use	Sleep Quality
Male	General daily digital media (social media) use	Correlation Coefficient	1.000	.050
		Sig. (2-tailed)		.543
		N	150	150
	Sleep Quality	Correlation Coefficient	.050	1.000
		Sig. (2-tailed)	.543	
		N	150	150
Female	General daily digital media (social media) use	Correlation Coefficient	1.000	-.019
		Sig. (2-tailed)		.820
		N	150	150
	Sleep Quality	Correlation Coefficient	-.019	1.000
		Sig. (2-tailed)	.820	
		N	150	150

To test **H3b**, which proposed that the effect of timing and duration of digital media (social media) use on sleep quality would vary by gender, a Spearman's rho correlation (table 12) was conducted separately for male and female respondents. For males, the correlation between general daily digital media (social media) use and sleep quality was very weak and positive ($\rho = .050$, $p = .543$, $N = 150$), indicating no statistically significant relationship. This means that, among male participants, an increase or decrease in daily digital media (social media) use did not meaningfully correspond with changes in reported sleep quality. For females, the correlation was also negligible but negative ($\rho = –.019$, $p = .820$, $N = 150$), again showing no significant association between general daily digital media (social media) use and sleep quality. These results suggest that, regardless of gender, general daily use of digital media (social media) does not have a measurable effect on sleep quality. Therefore, H3b is not supported by the data, as no significant gender-based variation in the relationship was observed.

A Mann-Whitney U test was conducted to examine whether students living in hostels experience greater sleep disturbances due to digital media (social media) use compared to those living outside hostels. The results showed in figure 3 that the distribution of sleep quality scores did not significantly differ between hostelized students (Mean Rank = 158.20) and non-hostelized students (Mean Rank = 143.20), U = 10118.00, Z = [insert], p = 0.133. Since the p-value exceeded the .05, the null hypothesis was retained. Therefore, the findings suggest that living arrangements (hostel vs. non-hostel) do not significantly influence the impact of digital media (social media) use on sleep quality among students.

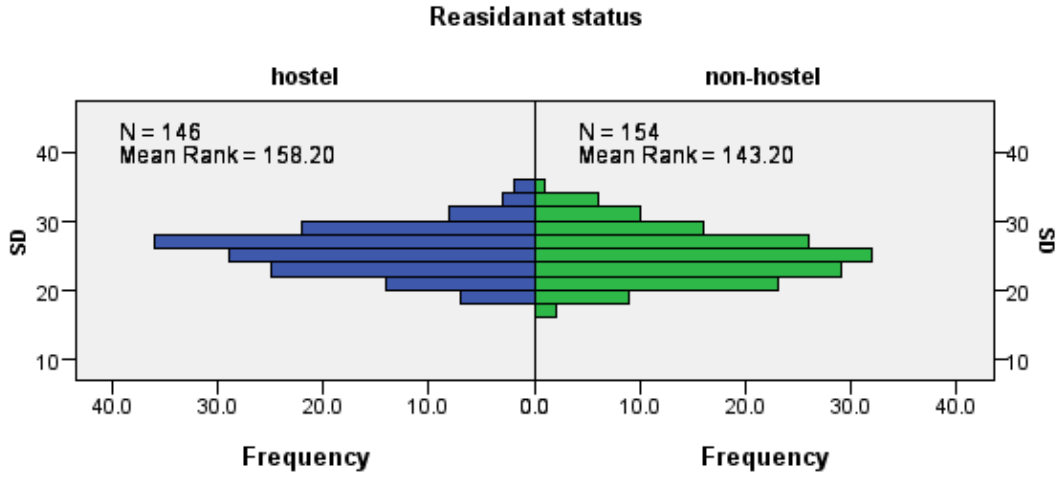

Figure 1 Mann-Whitney U Test Sleeping disorder between hostelized and non-hostalized students

Table 13
Mann-Whitney U Test

Statistic	Value
Total N	300
Mann–Whitney U	10,118.000
Wilcoxon W	22,053.000
Test Statistic	10,118.000
Standard Error	748.305
Standardized Test Statistic	-1.502
Asymptotic Sig. (2-sided test)	.133

Table 14
Description of Figure 2

Group	N	Mean Rank	Interpretation
Hostel Students	146	158.20	Higher mean rank indicates slightly more reported sleep disturbances compared to non-hostel students.
Non-Hostel Students	154	143.20	Lower mean rank indicates comparatively fewer sleep disturbance symptoms.

There was no statistically significant difference in sleep disorder scores between hostelized and non-hostelized students, according to the Mann–Whitney U test (U = 10,118.000, Z = –1.502, p =.133). The difference was not significant at the 0.05 level, indicating that living circumstances do not significantly alter sleep disturbances linked to social media use, even though hostel students had a higher mean rank (158.20) than non-hostel students (143.20).

This study sets out to investigate the impact of digital media (social media) use on students' sleep quality by addressing five specific research questions with corresponding hypotheses.

Research Question 1 (RI1) examined whether digital media (social media) use in general is related to sleep quality among students. The results indicated a weak but positive correlation between the two variables, although not statistically significant. This suggests that a high level of digital media (social media) engagement was not a reliable

predictor of poor sleep quality in this sample. While previous studies (e.g., Woods & Scott, 2016) although frequent digital media (social media) use is often associated with sleep disorders, current findings highlight the complexity of this relationship. Other moderating factors, such as coping strategies, effective time management, or individual sleep habits, may mitigate the negative effects of digital media (social media).

The second research question (QR2) concerned the influence of the timing of digital media (social media) use, particularly before bedtime, on sleep quality. The analyses showed that using digital media (social media) before bedtime was associated, to some extent, with sleep disturbances, although this association was weak and not statistically significant. The result is partially consistent with studies showing that exposure to screens until late at night can suppress melatonin production and delay the onset of sleep (Chang et al., 2015). However, the lack of significance could indicate that the students in this sample have already adapted their habits to compensate for the use of music until late at night, for example, by establishing flexible wake-up times or using digital media (social media) as a relaxation tool. The results confirmed the idea that the time of day alone does not determine sleep disorders. These are more closely related to lifestyle, stress levels, and individual tolerance.

Research question 3 (RI3) aimed to determine whether the effect of digital media (social media) use on sleep quality varied by sex. Three hypotheses (H2, H2a, H2b) were tested. Men and women reported identical sleep results regardless of their usage of digital media (social media), according to the chi-square test (H2), which did not find a significant association between sex and sleep quality. Regardless of gender, the Pearson correlation (H2a) revealed no meaningful link between digital media (social media) use and sleep issues. Only in men (H2b), the Spearman correlation revealed a weakly positive connection, although it was not statistically significant. These findings cast doubt on earlier research that discovered gender disparities (Wickham, et al., 2020). Digital media (social media) use is often associated with an increased risk of sleep disruptions for women. One explanation could be that the students in this sample, both male and female, utilize digital media (social media) in comparable ways, which lessens the disparity in digital behavior between the sexes. It's also possible that factors other than sex, including psychological health or academic pressure, have a bigger impact on sleep quality.

The purpose of research question 4 (RI4) was to ascertain whether using digital media (social media) later and for longer periods of time was more strongly linked to poorer sleep quality and whether these effects differed by gender. Testing the hypotheses (H3, H3a, and H3b) produced a number of significant results. There was no discernible correlation between the amount of time spent on digital media (social media) and the quality of sleep, according to the chi-square analysis for H3. Both regular daily use and bedtime use did not substantially predict sleep quality, according to a multiple regression analysis for H3a. Lastly, both men and women showed weak and non-significant relationships according to Spearman's rank correlation coefficient by sex (H3b). In conclusion, our findings imply that poor sleep quality in this population is not directly predicted by the amount of time spent on digital media (social media). In contrast, research highlighting the impact of screen time does shows a direct correlation between extended screen time and sleep difficulties. One possibility could be that students take compensatory actions to lessen the detrimental consequences of extended digital media (social media) use, like taking naps during the day or changing their study schedules. Additionally, cultural and contextual factors, including Pakistani school practices, may lessen the variety of sleep disruptions, making group differences statistically negligible.

The purpose of research question 5 (RI5) was to find out if students who live in university residence halls had greater sleep difficulties due to digital media (social media) than students who live with their parents. The null hypothesis was confirmed by the Mann-Whitney U test, which showed no significant differences between the two groups ($p = 0.133$). This implies that digital media (social media)'s negative effects on sleep quality are not adequately mitigated by living situations. This finding defies the theory that digital media (social media) use would increase until late at night in a shelter setting with less peer pressure and parental monitoring, leading to sleep issues. One explanation could be that the distinction between students who live on campus and those who do not has become hazier due to the availability of mobile devices and the internet. Both generations may experience comparable technical, social, and academic demands, which could result in distinct digital media (social media) usage patterns and sleep disorders.

Conclusion

The conclusion drawn from the five research questions is that digital media (social media) use did not have a statistically significant impact on time, duration, sex, or living circumstances in this study, despite being intuitively associated with poor sleep. In certain instances, weak correlations were found, but they were insufficient to bolster the suggested theories. These findings imply that digital media (social media) is merely one of several variables that may contribute to sleep difficulties among students.

Recommendations

Based on the findings of this study, it is recommended that universities and health authorities promote digital literacy and responsible media use among students. Educational workshops and awareness campaigns should focus on developing self-regulation skills, helping students manage their emotional engagement with social media and reduce late-night usage. Institutions should integrate sessions on sleep hygiene, time management, and stress control within student counseling programs. Additionally, policymakers and educators should collaborate to design guidelines for balanced digital behavior, encouraging youth to use technology purposefully rather than habitually. Such initiatives can contribute to better mental well-being and sleep quality, ultimately fostering healthier digital lifestyles among university students.

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