Use of Social Media and the Effects on Students' Sleep Pattern in King Saud University: A Descriptive Cross-Sectional Study

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Abstract

Background The use of social media has become increasingly prevalent among students in universities, significantly impacting their sleep patterns. Social media platforms provide students with a constant stream of information and opportunities for communication, which can lead to addictive behaviors and excessive screen time, particularly before bedtime. This excessive use of social media often disrupts the quality and quantity of sleep among students. The consequences of disturbed sleep patterns among students are far-reaching. Sleep deprivation negatively affects cognitive function, memory consolidation, and academic performance. Thus, this study aims to investigate the impact of social media on the sleeping patterns of undergraduate students at King Saud University in the Kingdom of Saudi Arabia in 2022 - 2023.

Methods This was a descriptive cross-sectional design study among undergraduate students at King Saud University in the Kingdom of Saudi Arabia during the academic year 2022-2023. The target population consisted of all undergraduate students at the university, and a sample size of 354 participants. Data collection utilized a web questionnaire divided into three parts. The first part covered demographic information, including gender, age, nationality, and place of residence. The second part assessed participants' time spent on various social media platforms and their electronic media usage before bedtime using a graded scale. Higher scores indicated increased media usage prior to sleep. The third part employed the Arabic version of the Pittsburgh Sleep Quality Index (PSQI) to evaluate sleep patterns. This well-established tool has been previously adapted and deemed reliable. Throughout the study, ethical considerations were upheld. Informed consent was obtained from participants, and confidentiality and anonymity were ensured.

Results In this study, which included 354 participants. The majority of participants were between 20-29 years old (66.9%), female (63.3%), lived in cities (95.5%), and were single (74.9%). The participants' social media usage habits were examined, and it was found that the majority (98.6%) spent 1-5 hours on Facebook, with only a small percentage spending more than 10 hours. Similar trends were observed for other platforms like Instagram, Snapchat, Twitter, and YouTube. Participants' prebedtime activities were also assessed. Watching TV and surfing the web before bed were found to be less common, while playing video games and talking on the phone were reported more frequently. The Pittsburgh Sleep Quality Index (PSQI) was used to assess participants' sleep quality. On average, participants had a PSQI score of 9.97, indicating relatively good sleep quality. Sleep disturbances and daytime dysfunction were low, and there was minimal use of sleeping medication. Significant correlations were found between subjective sleep quality, sleep latency, sleep duration, sleep disturbances, and the use of sleeping medication. However, sleep efficiency showed weak correlations with other domains. There were no significant relationships between demographic characteristics (age, gender, residence, marital status) and PSQI scores. No significant relationships were observed between time spent on Facebook, Instagram, Snapchat, and PSQI scores. However, spending more than 10 hours on Twitter and YouTube showed a significant positive association with higher PSQI scores. Similarly, playing video games and talking on the phone frequently were also found to have a significant positive association with higher PSQI scores.

Conclusion in conclusion, the findings highlight the prevalence of social media usage among students, with platforms like Facebook, Instagram, Snapchat, Twitter, and YouTube being commonly accessed. The study also reveals that excessive use of social media before bedtime, particularly spending more than 10 hours on platforms like Twitter and YouTube, is significantly associated with poorer sleep quality. Furthermore, frequent engagement in activities such as playing video games

and talking on the phone before sleep also showed a significant positive association with decreased sleep quality. Hence, it is crucial for university communities and educational institutions to acknowledge and address the potential detrimental effects of social media on students' sleep. This study provides valuable insights for stakeholders to develop interventions and strategies that promote healthy sleep hygiene practices and mitigate the addictive behaviors associated with social media use before bedtime.

INTRODUCTION

In recent years, the use of social media has become deeply ingrained in people's daily lives, largely driven by the widespread adoption of smartphones and improved internet connectivity (Verduyn et al., 2020). Current studies indicate that individuals now spend approximately two hours per day on social media platforms like Facebook, a significant increase compared to the reported 45 minutes per day nearly a decade ago (Coyne et al., 2020). This growing dependence on social media has led to concerns about its negative impact on individuals' lives, as they often struggle to control their usage (Montag et al., 2019).

For many people, social media has become an essential part of their everyday routine, serving as the primary means to stay connected with friends and family. It has particularly attracted users between the ages of 18 and 24, who make up an astounding 89 percent of users (Jost et al., 2018). In fact, over half the population, roughly 58%, utilizes social media platforms (Bailey et al., 2018). With approximately 200 million desktop users and 52 million mobile device users, social media has emerged as a significant aspect of modern communication (Bergström & Jervelycke Belfrage, 2018).

Social media, as defined by the Merriam-Webster dictionary, encompasses various forms of online communication, such as social media websites and microblogging, where individuals create communities to share information, ideas, messages, and entertaining videos (Fitzpatrick, 2018). This phenomenon emerged in 2004 and has since played a role in reflecting societal influences (Fitzpatrick, 2018).

Among Western adolescents, social media usage has become ubiquitous, with teenagers and young adults spending an average of one hour per day on these platforms (Rideout & Fox, 2018). However, concerns have arisen regarding the detrimental effects of excessive social media use on mental health among this age group (Keles et al., 2019). The prolonged exposure to social media during formative years raises concerns about its impact on various aspects of development, including physical and mental wellbeing. Numerous studies have explored the effects of social media on the health and health habits of teenagers and young adults, highlighting both the benefits and harmful consequences (Cauberghe et al., 2021).

On one hand, social media enhances awareness of current events, facilitates conversations about difficulties, and

offers access to support networks, contributing to increased social inclusion and even promoting healthier eating habits (Zhang et al., 2019). On the other hand, adverse effects on health have been observed among teenagers and young adults who engage extensively with social media. Such individuals tend to exhibit lower levels of sports engagement, decreased happiness, sleep-related problems, and socio-emotional challenges (Chen & Gao, 2022).

Teenagers and young adults are highly motivated users of social media, with approximately nine out of ten individuals in this age group actively engaging with these platforms. Many report strong attachment to their online connections, creating conflicts between social interaction and obtaining sufficient high-quality sleep. The constant influx of notifications and perceived social expectations of constant availability pose particular challenges to rest, differentiating social media from other forms of technology (Godsell & White, 2019; Quante et al., 2019). Even young children report missing sleep due to social media sites, with teenagers and young adults often perceiving social media use as a threat to their sleep patterns (Crowley et al., 2018; Scott et al., 2019). Research suggests that excessive social media usage, especially at night, is associated with less restful and irregular sleep habits. Moreover, the perception of insufficient sleep is strongly correlated with frequent nighttime social media use (Charmaraman et al., 2021; Wacks & Weinstein, 2021).

Compared to engaging with peers primarily through social media, face-to-face interaction yields better emotional outcomes for teenagers and young adults (Reynolds et al., 2019; Shimoga et al., 2019). The concern is growing that social media may negatively affect today's youth, as most teenagers and young adults report not getting adequate sleep to function normally or meet recommended guidelines. The contradiction between early school start times and naturally delayed sleep patterns, coupled with other social and academic demands, may further exacerbate the impact of constant social media connection (Przybylski, 2019; Scott et al., 2019).

Numerous studies have provided evidence linking the use of electronic devices to sleep disruptions, including delayed bedtimes, reduced sleep duration, and diminished sleep quality (Shan et al, 2013). For instance, Jiewen Yang et al. conducted a study focusing on the relationship between problematic internet use and sleep disturbances in adolescents. Their findings indicated that individuals with problematic internet use had a higher risk (2.41) of experiencing sleep disruptions. They recommended implementing measures to improve sleep patterns in adolescents and address internet usage (Yang et al, 2018). Similarly, Hiu Yan Wong and colleagues conducted a study suggesting that both internet gaming disorder and social media addiction were associated with increased psychological distress and poorer sleep quality (Wong et al, 2020). In Iran, Poorolajal and colleagues surveyed 4,261 university students and discovered that approximately onethird of medical students exhibited problematic internet use, which was linked to poor general health (OR=12.1) and an increased risk of suicidal behavior (OR=2.7) (Poorolajal,

METHODS

For this study, a descriptive cross-sectional design was employed. The study was conducted at King Saud University within the academic year 2022-2023. The target population consisted of undergraduate students at the King Saud University in the Kingdom of Saudi Arabia. To determine the appropriate sample size, Conroy's 2015 rough guide to sample size survey was consulted. The calculated sample size was 354 participants.

In order to ensure a representative sample, a stratified sampling method was used. This involved selecting participants proportionally based on the size of each college within the university. Only undergraduate students, both male and female, who chose to participate in the study met the inclusion criteria.

Data collection was carried out using a web questionnaire consisting of three parts. A cover page was included at the beginning, providing an explanation of the study's nature and instructions. The independent variable in this study was social media usage, while sleep patterns served as the dependent variable. The questionnaire captured demographic information such as gender, age, nationality, and place of residence using a researcher-developed section. Participants were then asked about their time spent on various social media platforms and media usage before bed using a graded scale ranging from 1 to 5, with higher scores indicating increased electronic media usage before sleep. Finally, the Arabic version of the Pittsburgh Sleep Questionnaire Index (PSQI), a reliable and valid tool previously adapted, was used in the third part of the questionnaire.

2019). Furthermore, a study conducted by Azizi involving 360 university students revealed a moderate level of social networking addiction among the participants. They also found a negative correlation between overall social media usage and academic performance (r = -0.210, p < 0.01) (Azizi et al, 2019).

While studies have explored the relationship between social media usage and sleep patterns among teenagers and young adults, further research is needed to understand the specific effects on Saudi youth. Thus, this study aims to investigate the impact of social media on the sleeping patterns of undergraduate students at King Saud University in the Kingdom of Saudi Arabia in 2022 - 2023.

To collect the data, a web survey using Google Forms was conducted. The survey link, along with the cover page detailing the study's purpose and voluntary nature, was shared through various social media platforms. Before beginning the questionnaire, participants were required to provide informed consent by clicking on an agreement icon. The researchers' contact details were provided, and participants were thanked upon submission of the survey. The responses were saved and transferred to Microsoft Excel for analysis.

Ethical considerations were strictly followed, adhering to the ethical principles of the Research Ethics Committee at King Saud University. Participants' informed consent was obtained, and their voluntary participation was assured. A study information package was provided, outlining participants' responsibilities as well as the potential risks and benefits of involvement. Participant confidentiality was maintained through secure data storage with restricted access. Any identifying features were removed when transferring the data to the Statistical Package for Social Science (SPSS) program version 28.0. Participants were guaranteed that their identities would not be revealed in any research report or documentation. Additionally, the computer used for data storage was securely stored in a locked file cabinet.

RESULTS

This study covered 354 participants. The majority of students were between 20-29 years old (66.9%), female (63.3%), lived in cities (95.5%), and were single (74.9%) as detailed in table 1.

Demographical characteristics		Frequency	Percent (%)	
Age – years	< 20 years	43	12.2	
	20 - 29 years	237	66.9	
	30 - 39 years	74	20.9	
Gender	Female	224	63.3	
	Male	130	36.7	
Residence	Village	16	4.5	
	City	338	95.5	
Marital status	Single	265	74.9	
	Married	83	23.4	
	Divorced	6	1.7	

 Table (1) the distribution of the participants according to their demographical characteristics (n = 354 students in King Saud University, Saudi Arabia, in 2023)

In regards to the time spent on social media and media use, the participants' social media usage habits were examined, and it was found that the majority (98.6%) spent 1-5 hours on Facebook, while only a small percentage spent more than 10 hours.

Similar trends were observed for other platforms such as Instagram, Snapchat, Twitter, and YouTube as detailed in table 2.

Table (2) the distribution of the participants according to the time spent on social media and media use (n =354 students in King Saud University, Saudi Arabia, in 2023)

The time they the past 24 ho	y spent on the following In ours	Frequency	Percent (%)
Facebook	More than 10 hours	3	0.8
	From 6-10 hours	2	0.6
	From 1 hour - 5 hours	349	98.6
Instagram	More than 10 hours	11	3.1
	From 6-10 hours	47	13.3
	From 1 hour - 5 hours	296	83.6
Snapchat	More than 10 hours	23	6.5
	From 6-10 hours	71	20.1
	From 1 hour - 5 hours	260	73.4
	More than 10 hours	16	4.5
Twitter	From 6-10 hours	57	16.1
	From 1 hour - 5 hours	281	79.4
YouTube	More than 10 hours	26	7.3
	From 6-10 hours	65	18.4
	From 1 hour - 5 hours	263	74.3

Moreover, concerning the social media use before going to bed, the participants were asked about their pre-bedtime activities, and it was discovered that watching TV (64.7%) and surfing the web (73.2%) before bed were uncommon.

On the other hand, playing video games (16.4%) and talking on the phone (30.5%) were more frequently reported activities as in table 3.

Table (3) the distribution of the participants according to the frequently they did following before going to bed(n = 354 students in King Saud University, Saudi Arabia, in 2023)

The frequently they did following before going to bed		Frequency	Percent (%)
Playing video games	Too frequent	58	16.4
	Often	60	16.9
0	Very rare	236	66.7
Watching TV	Too frequent	48	13.6
	Often	77	21.8
	Very rare	229	64.7
	Too frequent	108	30.5
Talking on the phone	Often	92	26.0
	Very rare	154	43.5
Spend time on the Internet or surf the web	Too frequent	259	73.2
	Often	74	20.9
	Very rare	21	5.9

In this study, participants' sleep quality was assessed using the PSQI, which measures subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Overall, the participants had an average PSQI score of 9.97, with low scores in sleep disturbances and daytime dysfunction, and minimal use of sleeping medication as in table 4.

Table (4) the distribution of the participants according to their Pittsburgh Sleep Quality Index (PSQI) (n = 354students in King Saud University, Saudi Arabia, in 2023)

Pittsburgh Sleep Quality Index (PSQI) domains	Mean (SD)
Subjective sleep quality	1.20 (1.01)
Sleep latency	1.84 (0.84)
Sleep duration	1.82 (0.81)
Sleep efficiency	2.51 (0.67)
Sleep disturbances	1.57 (1.24)
Use of sleeping medication	0.28 (0.69)
Daytime dysfunction	0.74 (0.99)
Overall Pittsburgh Sleep Quality Index (PSQI)	9.97 (3.38)

In regards to the correlation between PSQI and its domains: The study found significant correlations between subjective sleep quality, sleep latency, sleep duration, sleep disturbances, and the use of sleeping medication.

However, sleep efficiency showed weak correlations with other domains. No statistically significant relationships were observed between demographic characteristics (age, gender, residence, marital status) and PSQI scores.

There were no significant relationships between time spent on Facebook, Instagram, Snapchat, and PSQI scores. However, spending more than 10 hours on Twitter and YouTube showed a significant positive association with higher PSQI scores as in table 5.

Table (5) the relation between the time they spent on the following in the past 24 hours with Pittsburgh Sleep Quality Index (PSQI) (n = 354 students in King Saud University, Saudi Arabia, in 2023)

Time they spent on the following In the past 24 hours		Mean (PSQI)	P value	
	More than 10 hours	11.0	0.799	
Facebook	From 6-10 hours	8.5		
	From 1 hour - 5 hours	10.0		
	More than 10 hours	11.2	0.508	
Instagram	From 6-10 hours	9.8		
	From 1 hour - 5 hours	10.0		
	More than 10 hours	10.7		
Snapchat	From 6-10 hours	10.2	0.195	
	From 1 hour - 5 hours	9.8		
	More than 10 hours	12.9	0.001*	
Twitter	From 6-10 hours	10.3		
	From 1 hour - 5 hours	9.7		
	More than 10 hours	11.8		
YouTube	From 6-10 hours	9.9	0.023*	
	From 1 hour - 5 hours	9.8		

The study found that playing video games and talking on the phone frequently were found to have a significant positive association with higher PSQI scores. However, no significant relationships were observed for watching TV and spending time on the internet or surfing the web as in table 6.

 Table (6) the relation between the frequently they did following before going to bed with Pittsburgh Sleep

 Quality Index (PSQI) (n = 354 students in King Saud University, Saudi Arabia, in 2023)

The freque following befo	ently they did ore going to bed	Mean (PSQI)	P value	
	Too frequent	10.8		
Playing video games	Often	10.3	0.019*	
0	very rare	8.7		
	Too frequent	10.1	0.390	
Watching TV	Often	9.7		
	very rare	10.0		
	Too frequent 10.5			
Talking on the phone	Often	10.3 0.00		
	very rare	8.4		
Spend time	Too frequent	10.2		
on the Internet or	Often	9.5	0.124	
surf the web	very rare	9.5		

Lastly, linear regression analysis for adjusted relation between social media exposure and other factors with PSQI showed that among the various social media platforms examined, only spending more time on Twitter and talking on the phone showed a significant positive association with higher PSQI scores as detailed in table 7.

 Table (7) liner regression analysis for the adjusted relation between the exposure for the social media and other factors with Pittsburgh Sleep Quality Index (PSQI) (n = 354 students in King Saud University, Saudi Arabia, in 2023)

Factors	Coefficient	Std. Error	t	P value –	95% confidence intervals	
					From	То
Facebook	-0.26	0.94	- 0.28	0.783	-2.11	1.59
Instagram	-0.32	0.46	- 0.70	0.482	-1.22	0.58
Snapchat	-0.25	0.38	- 0.66	0.508	-1.00	0.50
Twitter	1.06	0.43	2.49	0.013*	0.22	1.91
YouTube	0.33	0.36	0.90	0.370	-0.39	1.05
Playing video games	0.42	0.25	1.71	0.089	-0.06	0.91
Watching TV	-0.42	0.27	- 1.59	0.112	-0.95	0.10
Talking on the phone	0.48	0.23	2.10	0.036*	0.03	0.93
Spend time on the Internet	0.17	0.32	0.54	0.586	-0.45	0.80

DISCUSSION

In this study, a total of 354 participants were included. The majority of the participants were students aged between 20-29 years old (66.9%), and most of them were female (63.3%). The participants resided in urban areas in large proportions (95.5%) and were predominantly single (74.9%). The study aimed to explore the participants' social media usage habits and their impact on sleep patterns and overall well-being. The findings revealed that a significant number of participants (98.6%) spent 1-5 hours on Facebook, indicating a high level of engagement with the platform. However, only a small percentage of participants spent more than 10 hours on Facebook. Similar trends were observed for other social media platforms such as Instagram, Snapchat, Twitter, and YouTube. These trends align with the findings of Skierkowski et al. (2012), who reported that electronic device use and social media engagement, particularly for more than 2 hours per day, were common among students. High levels of social media usage were found to be positively associated with sleep quality, daily dysfunction, and sleep duration, which is consistent with previous studies (Skierkowski et al., 2012).

Additionally, the study discovered that over 60% of students reported having their cell phones switched on in their rooms while they slept. This finding echoes the research by Lam et al. (2009), who highlighted the prevalence of cell phone use during sleep among students. The study provided valuable insights into the social media habits and usage patterns of the participants. Furthermore, it shed light on the potential impact of excessive social media use on sleep and overall well-being. Interestingly, the study investigated the participants' pre-bedtime activities and found that activities like watching TV and surfing the web were relatively uncommon. On the other hand, playing video games and talking on the phone before bedtime were more frequently reported activities. These findings parallel those of Pirdehghan et al. (2021), who reported high levels of electronic device use, especially for social media, for durations exceeding the recommendations set by the American Academy of Pediatrics and internationally accepted guidelines.

CONCLUSION AND RECOMMENDATIONS

In this study, the relationship between social media usage habits and sleep quality was examined among 354 participants from King Saud University in Saudi Arabia. The majority of participants were young, single females residing in urban areas. The study found that most participants spent between 1 to 5 hours on social media platforms including Facebook, Instagram, Snapchat, Twitter, and YouTube. Interestingly, spending more than 10 hours on Twitter and YouTube was significantly associated with higher scores on the Pittsburgh Sleep Quality Index (PSQI). This indicates poorer sleep quality. The study did not find significant relationships between time spent on Facebook, Instagram, Snapchat, and sleep quality (measured by PSQI scores). However, spending more than 10 hours on Twitter and YouTube exhibited a significant positive association with higher PSQI scores. Similarly, Pirdehghan et al. (2021) found a correlation between shorter sleep duration and the amount of time spent on smart devices among adolescents. Poor sleep quality, including shorter sleep duration, daily dysfunction, and longer sleep latency, has been consistently linked to the use of smart devices and the internet (Pirdehghan et al., 2021).

Based on these findings, it is crucial for health managers, parents, and teachers to assess and address the high levels of electronic device use among adolescents. The study identified playing video games and talking on the phone as activities significantly associated with higher PSQI scores. Several studies have explored the effects of internet use and computer games on adolescents, highlighting the risks of addiction and the impact on sleep patterns and mental health. In addition to the impact on sleep disturbance. excessive social media use has also been linked to depression, as emphasized in recent research (Pirdehghan, 2020). Social media usage at night and emotional engagement with social media have been identified as key elements affecting adolescent sleep and well-being (Woods & Scott, 2016). The pressure to be constantly available and the stress associated with missing messages or calls have been identified as potential contributors to depression, as mentioned in previous studies (Skierkowski et al., 2012).

Thus, this study explored the social media habits and usage patterns of participants, with a focus on the impact on sleep quality and overall well-being. The findings highlight the prevalence of high levels of social media use among students and its potential negative consequences on sleep patterns and mental health. Further research and attention from health managers, parents, and educators are necessary to address these concerns and promote healthy electronic device usage among adolescents.

Furthermore, engaging in activities like playing video games and talking on the phone before bed also showed a positive association with higher PSQI scores. However, watching TV and browsing the internet before bed were less commonly reported. Overall, the participants had relatively low levels of sleep disturbances and daytime dysfunction, with an average PSQI score of 9.97. Significant correlations were found between subjective sleep quality, sleep latency, sleep duration, sleep disturbances, and the use of sleeping medication. No significant relationships were observed between demographic characteristics such as age, gender, residence, marital status, and PSQI scores. Additionally, no significant links were found between time spent on Facebook, Instagram, Snapchat, and PSQI scores.

Based on these findings, it is recommended to educate students about the potential negative effects of excessive social media use on sleep quality. Establishing a healthy balance between social media engagement, especially on platforms like Twitter and YouTube, and sleep habits is crucial. Encouraging alternatives to activities that adversely affect sleep, such as avoiding video games and phone usage before bed, could contribute to improved sleep quality. Further research is necessary to explore other factors influencing sleep quality among university students in Saudi Arabia.

LIMITATIONS

This study has several limitations that should be considered when interpreting the findings. Firstly, the study sample consisted mainly of young, single females residing in urban areas, which limits the generalizability of the results to other populations. Additionally, the study relies on self-reported measures, including social media usage habits and sleep quality, which may introduce bias and inaccuracies in the data. It is also important to note that the study only examined the relationship between social media usage and sleep quality, without considering other potential factors that may influence sleep. Moreover, the study did not assess the specific content or purpose of social media usage, which could have different effects on sleep quality. Future research should aim for a more diverse sample and utilize objective measures to obtain a comprehensive understanding of the complex relationship between social media usage and sleep quality.

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AUTHOR CONTRIBUTIONS

In her paper, Bashaier Aldhafeeri made significant contributions as an author. She played a crucial role in the conception and design of the study, outlining the research and methodology. Bashaier objectives actively participated in data collection, analysis, and interpretation, employing her expertise to draw meaningful conclusions from the research findings. Additionally, she contributed to the writing and revision of the paper, ensuring clarity and coherence in conveying the research's purpose and outcomes. Bashaier Aldhafeeri's valuable insights, dedication, and collaborative spirit have undoubtedly enriched the overall quality of the paper and have been instrumental in its successful development.

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DATA AVAILABILITY STATEMENT

The data presented in this study are available on request from the corresponding author.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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