



Exploring The Relationship Between Nocturnal Social Media Usage, Quality of Sleep, Indecisiveness and Irritability in Emerging Adults.

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Abstract

Nocturnal social media use has seen an increase especially during Covid-19. Multiple studies have shown both positive and negative impacts on sleep quality and other psychological and cognitive parameters. The present study aimed to further investigate the relationship between nighttime social media usage, quality of sleep, indecisiveness and irritability in emerging adults.

Results showed that increased amount of nighttime social media use showed no significant influence on quality of sleep, indecisiveness or irritability however proximity of the use of social media to bedtime did show a significant negative influence on irritability but not on other parameters.

Keywords: *Nocturnal, Quality of Sleep, Indecisiveness, Irritability, Mood, Cognition.*

Introduction

The advent of artificial light could be considered the first physical threat to human beings' ability to adhere to their internal biological clock with specific impact on their natural sleep cycle. The detrimental effect of inadequate sleep is well evidenced. The first and the most direct effect would be the effect of blue light from modern smart devices which hinders normal melatonin regulation which leads to a negative impact on the ability to fall asleep (Cajochen et al., 2011). Sleep deprivation impacts memory, attention and higher order functions and has neurobiological impacts in the form of structural changes in the brain (Goel et al., 2009).

The development of tools such as the radio, television and presently a computer or a mobile phone with an internet connection which keeps the mind in a stimulated state have further affected the relationship between human beings and their sleep cycle. Screen time defined using devices with a digital display like an iPad, a mobile phone, laptop, television, computer etc, have shown to have a clear negative effect on the quality of sleep. Screen time has shown to have a detrimental relationship with sleep onset, quality and duration in toddlers, school going children and adolescents (Hale et al., 2018). Use of social media pre-sleep showed associations with heightened mental arousal and overall shorter sleep duration (Scott & Woods, 2018). A survey showed that

80% of respondents reported reduced sleep time due to the use of social media post their normal bedtime (American Academy of Sleep Medicine Sleep Prioritization Survey, 2022).

Researchers have investigated the role of the fear of missing out (FOMO), specifically the uneasiness of not being connected to some gratifying experience as a propellant of the inability to stay away from social media (Przybylski et al., 2013). The need to stay connected to social media devices stems from the urge to adhere to social contracts to stay socially present albeit virtually (Zarhin, 2024). Blakemore (2018), highlights that for adolescents, a social media presence at the cost of prioritising sleep can be viewed as a compulsion to be accepted by their peers. Nighttime use of social media has clearly shown to be correlated negatively with sleep quality and positively with aggressive behaviours in emerging adults (Lin et al., 2024). Whipps et al. (2018) found that nocturnal media use had a negative impact on multiple parameters of good sleep indicators like duration and soundness. However, shedding light on individual difference and personal factors as mediators of the impact of nocturnal social media use on sleep quality, Das-Friebel et al. (2020), found that night time social media use was not clearly associated with sleep disturbance and psychological well being, but suggested that predispositions and presence of current affective disorders can amplify the negative impact of night time media use on immediate use without having any long term effect.

The link between use of social media, sleep quality and behavioural issues might be more complicated when we consider that a reduction in sleep time amplifies mood imbalances and faulty higher order thinking but does not show a clear impact on these parameters in individuals who don't show such issues before the degradation in sleep quality (Saghir et al., 2018). Thus, there might not be a uniform impact of the use of social media at night on sleep patterns and quality.

Lemola et al. (2015), found an indirect relationship between use of electronic media specifically at night and depressive symptoms and a clear link to reduced duration of sleep.

Mood Effects

Thus, screen time has both a multidimensional adverse impact on a diverse range of age groups. This assessment is solely pertaining to exposure to screen time regardless of what is being watched. Contrary research also exists when one factors in the content and focus of social media use. Wilcox and Stephen (2013) found that using social media to engage with close friends and showed improved self esteem, however they found a reduction in self control specifically that in eating behaviours.

Cognitive Effects

Research evidence exists which shows that the consequences of poor night time sleep can lead to negative impacts on daily functionality and also impact several affective and cognitive domains. A positive relationship was found between internet addiction and daytime drowsiness (Demir et al., 2020), which could be the result of high levels of arousal and alertness demanded to be engaged in online activities which might have a detrimental impact on sleep quality in individuals with internet addictions (Tereshchenko et al., 2021). Interestingly the COVID-19 induced lockdown has also shown to be a factor in the alarming change in the preferred time of social media engagement. Cellini et al. (2020), found that the prolonged lockdown had the consequence of pushing online behaviour time closer to bedtime.

It must be noted however that in their eight year long, longitudinal study Coyne et al. (2020) found contrary results suggesting that a higher time spent on social media does not show a clear negative influence on individual psychological health. Barry et al. (2017), found that adolescents who reported having a larger number of social media accounts were adjudged to show more

symptoms of inattention, impulsivity and anxiety among other psychological parameters and some of the mental parameters were mediated by the experienced FOMO within this sample. Comparing one's life with that of others might be linked to negative outcomes whereas creative content and being in contact with others lead to more positive outcomes (Radovic et., 2017). This suggests that to gain a holistic understanding of the impact of use of social media must factor in what is being watched and not just how long it is being watched.

The effect of social media usage and nocturnal social media use on sleep; anxiety, depression and self-esteem have been investigated however its impact on indecisiveness and irritability were not well explored specifically. Falling asleep is as much a biological act as much as it is a discipline issue. Being able to lay oneself on the bed is a conscious goal directed behaviour and includes inhibiting a plethora of urges stemming from our need to be connected to information and the society owing to the unavoidable stimulation which this holds right at our fingertips on our smartphones. Regularly giving in to these urges could be a symptom of weak executive functioning. Thus, accepting that indecisiveness and irritability are integral to decision making and goal directed behaviour it was understood to be pertinent to investigate whether nocturnal social media usage behaviours have a relationship between these key variables.

Methodology

The current study incorporated a quasi-experimental method. Experimental groups were formed based on the responses on the google form pertaining to the time and duration of nocturnal social media usage and about the proximity of social media usage to falling asleep. Increment in the amount nocturnal social media use was defined to be, 0 to 1 hour, 1 to 2 hours and 2 to 3 hours.

Proximity to bedtime was defined to be at three levels, 30 minutes, 60 minutes and 90 minutes within bedtime. Nocturnal time was defined as post 7 pm.

Materials

The survey, administered on Google Forms, was live for 3 weeks and gathered 160 responses. The online format allowed participants to complete the survey at their convenience, promoting higher response rates and ease of participation. At the start of the survey, a mandatory consent question was included to ensure that all participants were fully informed and agreed to participate voluntarily. To maintain confidentiality and anonymity, no identifying information was collected, and all responses were analysed as group data to protect individual privacy.

The Pittsburgh Sleep Quality Index (PSQI) which has demonstrated strong validity and reliability across various populations, including Indian university students (Manzar et al., 2015) was employed to measure sleep quality. The PSQI's psychometric properties have been well-established in young populations, confirming its utility for assessing sleep quality in similar demographic groups (Carpenter & Andrykowski, 1998).

Indecisiveness was measured using selected subscales from the *Decisional Conflict Scale (DCS)*, focusing on the support, uncertainty, and effective decision subscales. The DCS has been widely validated over the past 20 years, demonstrating excellent internal consistency and construct validity (O'Connor, 1995; Garvelink et al., 2019). These existing, pre-tested measures were utilised to maximise reliability and validity; however, modifications were made to increase relevance, aid understanding and reduce ambiguity. Explicit permission to use these scales without restriction was available.

The questions for irritability were developed and guided by pre-existing validated scales. Their structure, phrasing, and focus areas were referenced to ensure that the questions were aligned with standardised measures, allowing the items to be tailored to suit the context of the research.

Sample

The sample for the survey consisted of 160 respondents, primarily from urban areas in India, with a significant concentration in Mumbai. The demographic composition included 60% females, 38.8% males and 1.2% who preferred not to disclose their gender. Participants were aged between 18 and 36, with the majority falling within the 18 to 22 age range.

Hypotheses

Duration of use

1. There will be no statistically significant difference in the quality of sleep between groups with varying hours of nocturnal social media use.
2. There will be no statistically significant difference in the levels of irritability between groups with varying hours of nocturnal social media use.
3. There will be no statistically significant difference in experienced indecisiveness between groups with varying hours of nocturnal social media use.

Proximity Of social media consumption to sleep time

1. There will be no statistically significant difference in the quality of sleep between groups with varying proximity of nocturnal social media use to sleep time.
2. There will be no statistically significant difference in the levels of irritability between groups with varying proximity of nocturnal social media use to sleep time.

3. There will be no statistically significant difference in experienced indecisiveness between groups with varying proximity of nocturnal social media use to sleep time.

Results

Three one-way ANOVA analyses were conducted to ascertain the differential impact of the amount of nocturnal social media use on sleep quality, indecisiveness or irritability. This analysis showed that there were no significant differences in its impact on sleep quality, indecisiveness or irritability.

Table 1. ANOVA regarding the amount of nocturnal social media use and sleep quality.

ANOVA				
<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	
Between-treatments	16.134	2	8.067	$F = 1.04965$
Within-treatments	1076.01	140	7.685	
Total	1092.153	142		

Table 2. ANOVA regarding the amount of nocturnal social media use and irritability.

ANOVA				
<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	
Between-treatments	1.739	2	0.869	$F = 2.81786$
Within-treatments	43.202	140	0.308	
Total	44.941	142		

Table 3. ANOVA regarding the amount of nocturnal social media use and indecisiveness.

ANOVA				
<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	
Between-treatments	729.5832	2	364.7916	$F = 1.30651$
Within-treatments	39089.392	140	279.2099	
Total	39818.9752	142		

It was found that there is no significant difference in mean quality of sleep due to varying hours of nocturnal social media use, ($F(2,140) = 1.04$, ns). Further, it was found that there is no significant difference in mean levels of irritability due to varying hours of nocturnal social media use, ($F(2,140) = 2.81$, ns). It was shown that there is no significant difference in mean experienced indecisiveness due to varying hours of nocturnal social media use, ($F(2,140) = 1.30$, ns). Therefore '1 to 2 hours', '2 to 3 hours' and 'more than 3 hours' of nocturnal usage of social media did not show any significant difference in its impact on sleep quality, levels of irritability and experienced indecisiveness in the study.

Three separate one-way ANOVA analyses were conducted to ascertain the differential impact of the proximity of social media consumption to bedtime sleep quality, indecisiveness or irritability. This analysis showed that there were no significant differences in its impact on sleep quality, indecisiveness, however there was a difference in the experience of irritability based on when social media was used in relation to participants' bedtimes.

Table 4. ANOVA regarding the proximity of social media consumption to bedtime and sleep quality.

ANOVA				
Source	SS	df	MS	
Between-treatments	2.494	2	1.247	$F = 0.15207$
Within-treatments	1287.749	157	8.202	
Total	1290.243	159		

Table 5. ANOVA regarding the proximity of social media consumption to sleep time and experienced irritability.

ANOVA				
Source	SS	df	MS	
Between-treatments	2.9034	2	1.4517	$F = 4.90925$
Within-treatments	46.4256	157	0.2957	
Total	49.329	159		

Table 6. ANOVA regarding the proximity of social media consumption to sleep time and experienced indecisiveness.

ANOVA				
Source	SS	df	MS	
Between-treatments	271.0645	2	135.5323	$F = 0.49941$
Within-treatments	42607.2737	157	271.3839	
Total	42878.3382	159		

It was found that there is no significant difference in mean quality of sleep due to varying proximity of social media consumption to bedtime, ($F(2,157) = 0.15$, ns). However, there was a statistically significant difference in mean levels of irritability in at least two groups due to varying proximity of social media consumption to bedtime, ($F(2,157) = 4.90$, $p = 0.008$). It was shown that there is no significant difference in mean experienced indecisiveness due to varying proximity of social media consumption to bedtime, ($F(2,157) = 0.49$, ns).” Therefore, the use of social media 0 to 30 minutes or 30 to 60 minutes or 60 to 90 minutes prior to participants' bedtime had no significant impact on quality of sleep and indecisiveness, but did have a variable impact on the experienced irritability within participants.

Discussion of Results

Number of hours spent on social media nocturnally did not show any significant negative impact on either sleep quality, levels of irritability and experienced indecisiveness. These findings have several potential explanations. A possible reason could be the quality of daytime activity that the participants engage in, which could be enriching and meaningful enough to mitigate the negative impacts of extended nocturnal social media use. Nighttime social media use can in some instances be used as a coping mechanism to alleviate negative affect (Almeida, 2023) which further complicates the understanding about the valence of its impact on psychological health.

A dichotomy of the nature of effects being positive or negative might also play a role in further muddling the character of impact of nocturnal social media use on cognitive and psychological parameters. Utilisation of social media at night could be positive if one is able to use consumption of social media as an escape from daily stressors and unwind and garner positive outcomes however inversely overuse of social media at night demanding cognitive effort and

heightened arousal can lead to negative outcomes (Starosta & Izydorczyk, 2020). Thus, the reason to engage with social media at night could also be a variable to explore before any concrete causal relationship could be attributed between nocturnal social media use and cognitive and affective parameters. A mitigating factor here could also be the nature of content being consumed by this sample which could be of an enriching quality and lead to more positive outcomes and reduce the negative impacts of the temporal nature of nocturnal social media usage.

Proximity to bedtime was seen as having a negative relationship with irritability. A reason for this could be the link between an inability to prioritise personal goals as an inherent personal characteristic of individuals making it difficult for them to cut off from social contact as suggested by Przybylski et al. (2013), and therefore experience a frustration which leads from the mismatch between the benefit of staying in touch with news and society at the cost of neglecting physiological demand of sleep.

A key reason for the nonsignificant impact of both duration and proximity of use to bedtime on sleep quality could be the scheduled life of students who made up a large number of the sample. Ability to catch up on sleep during the weekend could be a factor to mitigate negative effects. Self control as a determinant of behaviour can be strongly mediated by structured a lifestyle of a student which might only permit volitional free time nocturnally thus providing an inflated view of social media use as it might be the only slot of the day in which social media is used totally uninhibitedly and therefore might not lead to measurable cognitive or psychological issues as their overall use of social media may be low. Also being subjected to a scheduled life of a student having ownership and independent decision-making capacity about the bedtime might be cathartic and might induce a positive affective state.

An important theme that emerges is the relationship between nocturnal social media use and self control. Proximity to bedtime might be reflective of an inability to stop which represents a lack of self control. FOMO and lack of self control taken together could possibly hint towards a larger factor that or inhibitory control. This decrease in control behaviour was evident despite an increase in self esteem by Wilcox and Stephen (2013). Conclusions regarding the relationship between positive emotions and self control can also at best be correlational as self control involves inhibiting pleasurable impulses which can lead to a negative affective state (de Ridder, 2024), and positive affect has also show to improve self regulation by means of mitigating the negative effects of using mental energy in the act of inhibitory behaviours (Tice et al., 2007).

Conclusion

A clear impact of varying the duration social media use in the nighttime was not found on either quality of sleep, indecisiveness or irritability. However, proximity of social media use to one's bedtime showed a differential impact on irritability, suggesting that when one engages with social media in the nighttime can impact on psychological health, though this was not true for physiological parameters of sleep and decision making. The relationships between nocturnal social media use and sleep, indecisiveness and irritability are a complicated one. It involves the interplay of reasons to engage in social media at the nighttime, daytime affective valence built up, content of viewing and above all individual characteristics.

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