The Effect of Nighttime Social Media Use On Sleep Quality Among Pregnant Women In Surabaya

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Abstract.
Engaging with social media before going to sleep has become a common habit that may negatively affect sleep quality, especially among pregnant women who are more susceptible to sleep disturbances due to the physical and psychological changes they experience. This study aims to examine the effect of nighttime social media use on sleep quality among pregnant women in Surabaya, while also identifying the specific sleep components most affected. A total of 147 pregnant women (N = 147) in Surabaya participated in this quantitative cross-sectional study, with participant selection conducted through purposive sampling. Information was obtained by administering an online survey consisting of the Nighttime-Specific Social Media Use Scale (NSSMUS) and the Pittsburgh Sleep Quality Index (PSQI). Statistical analyses were performed using simple linear regression and Spearman's rho correlation to examine the seven components of the PSQI. The results showed that 95.9% of respondents (n = 141) experienced poor sleep quality (M = 11.47; SD = 3.40). The simple linear regression test demonstrated that nighttime social media use has a positive and significant effect on the overall sleep quality score ($F(1, 145) = 16.89$; $p < 0.001$; $R^2 = 0.104$; $B = 0.179$; $t = 4.109$), accounting for 10.4% of the variance; thus, the higher the social media use before bedtime, the poorer the sleep quality of pregnant women. Further analysis revealed the strongest correlations with prolonged sleep latency ($\rho = 0.360$; $p < 0.001$), daytime dysfunction ($\rho = 0.342$; $p < 0.001$), and nighttime sleep disturbances ($\rho = 0.329$; $p < 0.001$).
Keywords: *Pregnant women, sleep quality, nighttime social media use, NSSMUS and PSQI.*

I. INTRODUCTION

The phenomenon of nighttime social media use prior to bedtime has become a particular concern because it is closely associated with difficulty falling asleep and a decline in overall sleep quality [1, 2]. According to Borbély's Two-Process Model of Sleep Regulation [3], sleep is regulated by the interaction of two mechanisms: homeostatic sleep pressure (Process S), which gradually builds up as an individual stays awake, and the circadian rhythm (Process C), which is regulated by the release of melatonin during nighttime. Social media use before bedtime can delay the onset of sleep, thereby disrupting the accumulation of sleep pressure in Process S, while exposure to blue light from smartphone screens, as well as cognitive and emotional stimulation,

inhibits melatonin secretion in Process C [3, 4]. In line with Hauri's [5] perspective on sleep hygiene, using electronic devices in bed is a pre-sleep habit that hinders relaxation and reduces sleep quality [6].

Good sleep quality is a fundamental need during pregnancy to support physical recovery, the mother's emotional stability, and optimal fetal growth [7]. However, pregnant women are a group vulnerable to sleep disturbances due to physiological changes, physical discomfort, and anxiety leading up to childbirth [8, 9]. In pregnant women, inadequate sleep quality can lead to fatigue and emotional disturbances, while also being linked to a higher likelihood of pregnancy-related complications, including preeclampsia and preterm delivery [8, 10].

In today's digital era, pregnant women often engage with social media platforms, including Facebook, TikTok, Instagram, and X, both for entertainment during their leisure time and to obtain information about maternal health and fetal development [11, 12]. The habit of scrolling through social media at night carries the risk of triggering overthinking, anxiety, and excessive emotional involvement if pregnant women are exposed to negative information regarding pregnancy or childbirth [13, 14]. Despite evidence from earlier studies indicating a link between social media engagement and sleep quality in adolescents and young adults [13, 15], limited research has specifically investigated the effects of nighttime social media use and determined which dimensions of sleep quality are most affected among pregnant women in Indonesia.. In response to this research gap, the present study investigates the impact of nighttime social media use on sleep quality among pregnant women in Surabaya, with particular emphasis on determining the sleep quality components most

substantially influenced.

II. METHODS

A quantitative research method with a cross-sectional design was adopted, involving pregnant women residing in Surabaya as the study population. The study included 147 pregnant women (N = 147) recruited using purposive sampling. The study's inclusion criteria were: (1) pregnant women in the first, second, or third trimester; (2) those who own and actively use social media at night before bedtime; and (3) those willing to participate by signing an informed consent form. Data collection was conducted online using a structured questionnaire based on Google Forms, which was distributed via the WhatsApp messaging app to a network of pregnant women who had previously undergone prenatal checkups at primary health care facilities (puskesmas) in Surabaya. Data collection utilized two self-report instruments:

Sleep Quality

The Pittsburgh Sleep Quality Index (PSQI), developed by Buysse et al., was employed to evaluate sleep quality 16] and subsequently adapted for the Indonesian population [17]. The instrument evaluates sleep quality during the preceding month across seven dimensions: subjective sleep quality (K1), sleep latency (K2), sleep duration (K3), habitual sleep efficiency (K4), sleep disturbances (K5), sleep medication use (K6), and daytime dysfunction (K7).The PSQI total score falls within a range of 0–21; a value of ≤ 5 reflects good sleep quality, whereas a value of > 5 indicates poor sleep quality[16]. In this study sample (N = 147), the PSQI instrument demonstrated adequate reliability and is suitable for use, with a Cronbach's α value of 0.600.

Nighttime Social Media Use

Nighttime social media use was conducted using the Nighttime-Specific Social Media Use Scale (NSSMUS) developed by Woods and Scott [18]. The instrument comprises 7 items measuring the frequency and intensity of social media engagement from the period immediately before bedtime to the time spent in bed. A six-point Likert scale is employed to evaluate responses, assigning values from 0 to 5, with the cumulative score ranging from 0 to 35. Higher scores reflect a higher level of nighttime social media use [18]. Given the lack of a standardized adaptation of the NSSMUS instrument in Indonesian, the researchers translated all scale items into Indonesian and conducted an expert review with a supervising professor in psychology to ensure semantic equivalence and readability for participants prior to data collection. In this study sample (N = 147), the Indonesian version of the NSSMUS demonstrated high reliability with a Cronbach's α value of 0.802.

Data analysis was performed using JASP software. The Shapiro-Wilk test results demonstrated that the two primary variables satisfied the assumption of normality ($p > 0.05$). To determine the influence of nighttime social media use on sleep quality, simple linear regression was applied as the principal analytical method. In addition, Spearman's rho correlation test was used to examine the relationship between nighttime social media use and the seven individual components of the Pittsburgh Sleep Quality Index (PSQI), each of which was assessed using a score ranging from 0-3.

III. RESULTS AND DISCUSSION

Table 1. Demographic Characteristics and Sleep Quality Categories of Respondents

Variable	Category	Frequency	Percent
Gestational Age	1st Trimester	27	18.4
	Second Trimester	77	52.4
	Third Trimester	43	29.3
Pregnancy Order	First Pregnancy	75	51.0
	Second pregnancy	46	31.3
	Third or subsequent pregnancy	26	17.7
Employment Status	Employed	65	44.2
	Unemployed / Stay-at-Home Parent	82	55.8

Sleep Quality	Good (PSQI ≤ 5)	6	4.1
	Poor (PSQI > 5)	141	95.9

This study involved 147 pregnant women in Surabaya (N = 147). Based on the pregnancy characteristics in Table 1, the majority of participants were in their second trimester (52.4%) and were experiencing their first pregnancy (51.0%). In terms of employment status, more than half of the participants were unemployed or stay-at-home mothers (55.8%). Based on the PSQI global score cutoff (a score > 5 indicates poor sleep quality), nearly all pregnant women in this study experienced poor sleep quality—141 women (95.9%)—while only 6 women (4.1%) had good sleep quality.

Table 2. Descriptive Statistics

Variables	N	Mean	SD	Min	Max
Social Media Use at Night	147	16.33	6.15	0.00	35.00
Sleep Quality	147	11.47	3.40	2.00	19.00

This study involved 147 respondents. Table 2 presents the descriptive statistical findings, showing that nighttime social media use obtained a mean score of 16.33 and an SD of 6.15, with a minimum score of 0.00 and a maximum score of 35.00. Meanwhile, the global sleep quality variable had a mean of 11.47 with a SD of 3.40, as well as a minimum score of 2.00 and a maximum score of 19.00. These results provide an overview of the trends in average scores and score variations for both variables among the study respondents.

Table 3. Normality Test

Variable	Shapiro-Wilk	P-value
Nighttime Social Media Use	0.992	0.630
Sleep Quality	0.985	0.106

The normality of the research data distribution was examined using the Shapiro–Wilk test. Based on the test results in Table 3, the variable “nighttime social media use” yielded a Shapiro–Wilk value of 0.992 with a significance level (p-value) of 0.630. Meanwhile, the sleep quality variable yielded a Shapiro–Wilk value of 0.985 with a significance level of 0.106. Both variables had p-values greater than 0.05, so it can be concluded that the data for both variables did not show a significant deviation from a normal distribution. Thus, research variables were therefore found to conform to the normality assumption.

Table 4. Simple Linear Regression Test

Variables / Model	B	SE	β	t	P-value
Constant (Intercept)	8.552	0.758	—	11.280	< 0.001
Nighttime Social Media Use	0.179	0.043	0.323	4.109	< 0.001

Note: $R = 0.323$; $R^2 = 0.104$; $F(1, 145) = 16.89$; $p < 0.001$.

Table 4 presents the simple linear regression findings, demonstrating that the use of social media during nighttime significantly and positively influences the total score of sleep quality ($F(1, 145) = 16.89$; $p < 0.001$; $R = 0.323$). The coefficient of determination (R^2) value of 0.104 indicates that social media use at night accounts for 10.4% of the variation in sleep quality among pregnant women, while the remaining 89.6% is influenced by other factors. The regression equation obtained is $Y = 8.552 + 0.179X$ ($B = 0.179$; $\beta = 0.323$; $t = 4.109$; $p < 0.001$), indicating that for every one-point increase in the nighttime social media usage score, the PSQI score increases by 0.179 points. Since higher PSQI scores indicate poorer sleep quality [16], these results demonstrate that the higher the level of social media use before bedtime, the poorer the sleep quality of pregnant women.

Table 5. Correlation Test of PSQI Components

PSQI Components	Spearman’s ρ	P-value
Sleep Latency (K2)	0.360	< 0.001
Daytime Activity Impairment (K7)	0.342	< 0.001

Sleep Disorders (K5)	0.329	< 0.001
Subjective Sleep Quality (K1)	0.240	0.003
Use of Sleep Medications (K6)	0.180	0.029
Habitual Sleep Efficiency (K4)	0.062	0.458
Sleep Duration (K3)	-0.064	0.438

Based on the results of the Spearman's rho correlation test in Table 5, nighttime social media use is significantly and positively associated with five of the seven PSQI components. The strongest association was found with sleep latency ($\rho = 0.360$; $p < 0.001$), followed by daytime dysfunction ($\rho = 0.342$; $p < 0.001$), and nighttime sleep disturbances ($\rho = 0.329$; $p < 0.001$). Significant positive associations were also found for subjective sleep quality ($\rho = 0.240$; $p = 0.003$) and the use of sleep medications ($\rho = 0.180$; $p = 0.029$). Conversely, the components of habitual sleep efficiency ($\rho = 0.062$; $p = 0.458$) and sleep duration ($\rho = -0.064$; $p = 0.438$) exhibited no statistically significant associations ($p > 0.05$). Thus, nighttime social media use primarily affects the frequency of nighttime awakenings, the time it takes to fall asleep, and daytime fatigue, rather than a reduction in total sleep hours.

Discussion

These results align with earlier research indicating that engaging with social media before going to sleep can have detrimental effects on sleep quality [1, 2, 13, 18]. Among pregnant women in Surabaya, the high prevalence of poor sleep quality—reaching 95.9% (mean PSQI score of 11.47)—indicates that sleep disturbances during pregnancy are exacerbated by the habit of using social media at night. Since the majority of respondents were experiencing their first pregnancy (51.0%) and were in their second trimester (52.4%), social media use at night was often employed to seek information about pregnancy or to distract from physical discomfort [11, 12]. However, the habit of using social media right before bed actually makes it even harder for pregnant women to get a good night's rest.

Analysis of the seven PSQI components explains how nighttime social media use disrupts sleep in pregnant women, particularly regarding the time taken to fall asleep (K2), daytime sleepiness (K7), and nighttime sleep disturbances (K5). These findings align with Borbély's sleep regulation theory [3] and Hauri's principles of sleep hygiene [5]. Physically, light from cell phone screens at night inhibits the production of the hormone melatonin, which induces sleepiness; consequently, pregnant women take longer to fall asleep [3, 4]. Meanwhile, psychologically, reading pregnancy-related content or information that triggers anxiety keeps the mind and emotions active before bedtime [14]. As a result, pregnant women find it difficult to relax, experience restless sleep and frequent awakenings at night, and end up feeling drowsy and fatigued during their daily activities the following day.

Interestingly, the components of sleep duration (K3) and sleep efficiency (K4) did not show a significant association with social media use at night. This suggests that pregnant women actually maintain a relatively consistent total number of hours of sleep each day, but their sleep becomes restless due to device use before bed. In other words, the primary impact of nighttime social media use is not a reduction in the number of hours slept, but rather difficulty falling asleep initially and frequent awakenings in the middle of the night.

Several limitations of this study need to be acknowledged. First, respondents were selected online using purposive sampling through a specific network of community health centers in Surabaya; therefore, the results cannot be fully generalized to the entire population of pregnant women with a broader background. Second, the cross-sectional data collection relied on self-administered questionnaires completed at a single time point. The assessment focused solely on the frequency of nighttime social media use, without considering the types of content accessed (e.g., light entertainment or anxiety-provoking information) or other factors that may affect sleep quality during pregnancy, including physical discomfort and family support. Future research should consider these factors to develop a more comprehensive understanding of sleep quality among pregnant women. Despite these limitations, the present findings remain practically valuable for pregnant women, their families, and healthcare professionals in raising awareness about the importance of maintaining good sleep

quality during pregnancy, particularly through reducing electronic device use and limiting social media activity before going to bed.

IV. CONCLUSION

Based on the findings and discussion, this study concludes that nighttime social media use has a significant positive association with overall sleep quality scores among pregnant women in Surabaya. This indicates that more frequent social media engagement before bedtime is associated with poorer sleep quality. More specifically, nighttime social media use shows the strongest associations with sleep latency, daytime fatigue or sleepiness, and the frequency of nighttime awakenings, whereas no significant effects are observed on total sleep duration or sleep efficiency. These findings address the study's objectives by demonstrating that the habit of using social media before bedtime exacerbates sleep disturbances during pregnancy. From a practical perspective, this study provides valuable insights for healthcare professionals, pregnant women, and their families in promoting healthier sleep habits. These efforts can be incorporated into prenatal health education, particularly by encouraging reduced use of electronic devices and social media before bedtime to help protect maternal and fetal well-being.

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