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Relationship stress and sleep: examining the mediation of social media use for objective and subjective sleep quality

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Abstract

Romantic relationship stress is associated with poor sleep quality, theoretically by threatening belongingness needs. However, it is unclear how relationship stress directly and indirectly impacts sleep quality. This study aims to determine to what extent social media use mediates the relationship between romantic relationship stress and objective and subjective sleep quality. Longitudinal data comes from 35 emerging adults in romantic relationships who completed online surveys twice daily for 14 consecutive days while wearing Oura rings. The Oura rings captured objective sleep quality, and the surveys captured subjective sleep quality and the presence of romantic stress. Results revealed that social media use did not mediate the relationship between romantic relationship stress and sleep quality; however, social media use was predictive of poorer sleep quality, and relationship stress was predictive of increased objective time spent sleeping. These results prove that social media use is a stronger independent predictor of decrements in sleep quality compared to relationship stress.

1. Introduction

Romantic relationship processes contribute to health and well-being, particularly during stress. Often, romantic stress impedes sleep quality (Gordon et al., 2021; Kane et al., 2014). Sleep is an essential element of health, as studies have shown that low-quality sleep hinders psychological and physiological health (Luyster et al., 2012; Xie et al., 2024). Individuals with low relationship stress levels are likely to get better sleep. Sleep quality can be captured using Oura rings (Ōura Health, Oulu, Finland) that participants wear on their fingers, which collect objective sleep quality metrics, including sleep efficiency and time spent sleeping. However, another variable associated with sleep quality is social media use. Many studies have identified a negative relationship between social media use and sleep quality (Alonzo et al., 2021; Rafique et al., 2020; West et al., 2011). Although social media use and romantic relationship stress are negatively associated with sleep, it is unclear how both variables contribute to sleep quality. Social media is sometimes used to assuage stress, especially during the COVID-19 pandemic (Demirtepe-Saygili, 2022; Eden et al., 2020). In the cases of stress in romantic relationships, social media use may mediate the relationship between stress in relationships and sleep quality. Examining this potential mediating relationship helps address the call for research to understand better the mechanisms concerning *how* relationship stress impacts sleep quality (Xie et al., 2024).

This study aims to understand how social media use mediates the relationship between romantic relationship stress and subjective and objective sleep quality. This study advances the literature in several ways. First, the current study utilizes both subjective (i.e., sleep diary) and objective (i.e., Oura ring) sleep assessments to facilitate a better understanding of the effects of relationship stress and social media use on sleep and sleep perception. Past studies primarily relied on subjective assessments or retrospective data to capture sleep quality. The current study uses Oura rings and multiple online surveys to capture objective and subjective sleep quality. Second, studies investigating social media use and sleep quality tend to focus on social media use broadly or on a specific social media platform. The current study asks participants to report the average time they spend across five social media platforms (Facebook, Instagram, Snapchat, X (formerly known as Twitter), and TikTok), which are used as potential mediators. This approach differs from other studies in that it asks about the accumulated use across multiple social media platforms. Third, researchers have called for more longitudinal research on sleep quality and relationship processes (Xie et al., 2024). Participants in the present study completed surveys twice daily for 14 days to assess social media use, relationship stress, and sleep perception while wearing Oura rings to track sleep processes. Through these advances, the current study increases understanding regarding how social media and relationship stress directly and indirectly relate to sleep quality to inform ways to optimize sleep and subsequent health.

Background

Theoretically, relationship stress is likely to impede sleep quality. According to Baumeister and Leary (1995), individuals need to belong, and this need is often met through the formation of romantic relationships (Adamczyk, 2018). When romantic relationships are stressed, individuals' belongingness needs are threatened (Gere & MacDonald, 2010), which can disrupt sleep quality. When relationship quality is high, and stress is low, individuals experience healthier levels of physiological health (Baumeister, 2012; Gere & MacDonald, 2010). Additionally, using social media aids with belongingness needs. Individuals predominantly use social media to connect with others, regardless of whether or not they know someone or passively connect with others, such as viewing others' content or following others (Seidman et al., 2019; von Fedak & Langlais, 2024). Given the use of social media to connect with others, which promotes belongingness needs, individuals should have better sleep quality. However, social media can disrupt belongingness needs, such as promoting fears of missing out or in scenarios such as cyberbullying (Marcum et al., 2017). In these cases, given the threat to belongingness, individuals may report worsened sleep quality. Physiologically, social media can also disrupt sleep quality through the artificial light it produces. The combination of these psychological and physiological effects would affect sleep quality. However, it is unclear how social media could contribute to sleep quality for those in romantic relationships.

Empirical data illustrates that stress can damage sleep quality (Akerstedt et al., 2002; 2012; Kalmbach et al., 2018; Yap et al., 2020; 2021; 2022; 2024). First, perceptions of stress are associated with impairments in subjective sleep quantity and quality (Akerstedt et al., 2002, 2012). In approximately 5,000 adults, Åkerstedt et al. (2002) reported that greater work demands, lower support, and persistent rumination about work needs were associated with poorer sleep quality. Similarly, daily fluctuations in perceived stress and pre-sleep worry predicted decrements in subsequent sleep quality (Akerstedt et al., 2012). In a series of studies utilizing

objective measures of stress and sleep in a longitudinal ecological momentary assessment model, Yap et al. (2020; 2021; 2022; 2024) reported a bidirectional relationship between elevated stress and poor sleep quality. This relationship between stress and sleep quality extends into romantic relationships. In a recent comprehensive review, Xie et al. (2024) highlighted the complexity of the bidirectional association between relationship stress and sleep and its mediation through relationship-specific factors, including emotional and affective, self-perception, social perception, self-regulation, and biological mechanisms. One of these mechanisms includes stress associated with relationship quality. Haydon and Salvatore (2023) recently utilized 14-day actigraphy and sleep diary monitoring to capture daily fluctuations in relationship stress, which were associated with greater sleep disruption measured by wake after sleep onset, suggesting a relationship between daily relationship stress and subsequent sleep quality (Haydon & Salvatore, 2023). These findings and the burgeoning literature surrounding the impact of relationship stress and quality on sleep parameters support a key intersection between stress and sleep, particularly as they pertain to partner relations.

Social media use is also associated with sleep quality. First, it is important to recognize how many individuals use social media. According to Pew Research Center (2024), in the U.S., 67% of adults 18-29, 75% of adults 30-49, 69% of adults 50-65, and 58% of adults 65 and older use social media. The average individual has approximately 8.4 social media accounts globally (in the U.S., the average is 7.1 accounts) and spends about 145 minutes daily on social media (Wong & Bottorff, 2023). The five most popular social media accounts in the U.S. include Facebook, Instagram, TikTok, Snapchat, and X (note that other applications, like YouTube, WhatsApp, and WeChat, are inconsistently labeled as social media and, therefore, are not included in this list; Howarth, 2024). Although social media use is high, overusing social media, particularly before sleep, often hinders sleep quality (Alonzo et al., 2021; Kwok et al., 2021). Physiologically, artificial light from mobile screens decreases melatonin production, making it difficult to fall or stay asleep (Rafique et al., 2020; West et al., 2011). Psychologically, individuals may view content on screens that could distract them from focusing on sleeping. For instance, seeing content that results in feeling socially excluded or viewing content that promotes jealousy usually promotes arousal, making it difficult to fall and stay asleep (Almeida et al., 2022).

Additionally, stress may prompt individuals to use or not use social media. For some, using social media is a source of coping. For instance, during the pandemic, individuals in China used social media for problem-focused coping, socioemotional coping, and to mentally avoid stressors, although using social media to cope was not always psychologically beneficial (Sun et al., 2023). However, additional studies have found that social media produces stress more than alleviates it, particularly in romantic relationships. For instance, individuals may feel stressed if their romantic partner posts a picture of them that they disapprove of, or they are stressed if their partner does not post them at all (Langlais et al., 2024; von Fedak & Langlais, 2024; Seidman et al., 2019). Coupled participants also become stressed if they see content on social media that would make them jealous (Langlais et al., 2020). The relationship between stress and social media seems cyclical, where individuals may use social media to cope with stress but may be confronted with more information that compounds feelings of stress.

The Present Study

Getting quality sleep is important for health, yet romantic relationship stress and social media use – two common experiences – are linked to declines in sleep quality. The theory of belongingness can explain how relationship stress and social media use can threaten one's need to belong, impacting one's sleep. A gap in the literature is understanding why relationship stress hinders sleep quality (Xie et al., 2024). Given the often negative relationship between social media use and sleep quality, it can be argued that social media could mediate the relationship between stress and sleep quality. Theoretical and empirical evidence illustrates that stress, including relationship stress, can impair sleep quality, but many studies have focused on subjective sleep quality. This research advances past studies by capturing sleep quality objectively and subjectively longitudinally, daily for 14 consecutive days. The current study also tests social media use as a mediator, as no models have examined the simultaneous influence of social media use and stress on sleep quality. More research is needed to understand better the mechanisms in which relationship stress contributes to subjective *and* objective sleep quality and to what extent social media, directly and indirectly, contributes to this relationship. Therefore, we propose the following hypotheses:

Hypothesis 1: Social media use will mediate the relationship between romantic relationship stress and objective sleep quality.

Hypothesis 2: Social media use will mediate the relationship between romantic relationship stress and subjective sleep quality.

2. Method

Research Design

This quantitative study utilized a longitudinal design, where participants completed surveys twice daily for 14 consecutive days. Participants were undergraduate students recruited from a midsize university in the southern central United States. Although 40 participants were originally recruited, three experienced relationship dissolution at the beginning of the study and, therefore, were not included (N = 37). Using the GLIMMPSE power analysis software (Guo et al., 2013) for longitudinal data of 14 days, a power of .80, and an alpha of .05, we had enough participants to achieve the appropriate power level in this study.

Participants and Data Collection

Data was collected from February 2024 to May 2024. Participants were recruited from undergraduate courses in the Department of Health and Human Sciences at a midsize university in the south-central United States. Volunteering professors shared information about the study through their course management software (i.e., Canvas), which included details about the study, eligibility requirements (being 18 years or older and currently in a romantic relationship), what the study entailed, remuneration, and contact information for the research team. Interested participants emailed the research team to verify that they met the inclusion criteria; those who did were scheduled for an orientation session. During these sessions, participants were informed about the study's expectations and provided with an Oura ring to wear throughout the study. During this orientation, participants were instructed on using the Oura rings and completing online surveys in the morning and evening, which would be automatically emailed to them via Qualtrics. They had the opportunity to ask questions and, if they agreed to participate, could sign the consent form (all participants who were scheduled for an orientation attended the session and signed the consent forms, meaning there were no participants who showed up for the orientation but did not take part in the study). Participants were instructed to wear the Oura ring on their pointer, middle, or ring finger. Additionally, all participants received a random four-digit code to use on each online survey to align their data. These orientations took approximately 10 minutes to complete. The following day, participants were emailed a link to an online survey, which served as the baseline survey for this study, collecting demographic information such as age, gender, ethnicity, and year in school. The baseline survey also included measures of chronic relationship stress, average social media use across five platforms (Facebook, Instagram, Snapchat, X, and TikTok), and average texting frequency.

For the following 14 days, participants were sent a survey at 7 am CST and another at 8 pm CST. The morning surveys collected data on subjective sleep quality using a validated sleep diary (Carney et al., 2012). The evening surveys asked about acute relationship stress (Totenhagen et al., 2023). Once the 14 days passed, participants returned the Oura rings to the research team and were emailed a virtual Amazon gift card based on the number of surveys completed. Participants who completed between 80 and 90% of surveys received a $20 gift card; those who completed between 90 and 100% of online surveys received a $25 gift card; those who completed all online surveys received a $30 gift card; and participants who completed less than 80% of surveys did not receive remuneration. Of the 37 participants, 22 completed all 25 online surveys (baseline survey, 14 morning surveys, and 14 evening surveys). Completion rates ranged from 79.3% to 100% (M = 97.3%; SD = 4.4%).

Measures

Objective Sleep Quality

Oura rings (Ōura Health, Oulu, Finland) were utilized to objectively monitor sleep over the 14-day study period. Participants were instructed to wear their rings at all times during this period. Oura rings are commercially available and provide a noninvasive method for assessing at-home sleep parameters with minimal strain on participants. These rings detect sleep using proprietary multi-sensor assessments and have demonstrated strong sensitivity and specificity in identifying wake and sleep episodes (Altini & Kinnunen, 2021). They have also been validated against gold-standard polysomnography (de Zambotti et al., 2019). In a recent comparison to ambulatory polysomnography, Oura rings showed acceptable accuracy (92%), sensitivity (94%), and specificity (73%) in distinguishing wake from sleep (Svensson et al., 2024). Objective measures of total sleep time (TSTobj), sleep efficiency (SEobj), wake after sleep onset (WASOobj), and sleep onset latency (SOLobj) were recorded nightly for each participant. Importantly, all participants were blinded to their sleep information

collected in the Oura mobile app, minimizing any influence of personal sleep assessment on subsequent sleep behavior.

Subjective Sleep Quality

Subjective sleep quality, meaning participants' perceptions of their sleep, was measured using an established sleep diary (Carney et al., 2012). Participants were told to complete the sleep diary within one hour of waking up, which captured their estimated time sleeping (TST_{sub}), their estimated sleep onset latency (SOL_{sub}), the number of awakenings during the night ($Awakenings_{sub}$), and their estimated wake after sleep onset ($WASO_{sub}$). Example items included, "How long did it take for you to sleep (in minutes)?" and "How many times did you wake up, not counting your final awakening?" These scales have achieved sufficient validity as presented in previous studies (i.e., Altini & Kinnunen, 2021).

Relationship Stress

Relationship stress was measured using part a of the Romantic Relationship Stress Scale (Du Bois et al., 2023), comprising 12 relationship stressors. Through this scale, participants first indicated whether or not a relationship stressor occurred that day (*yes* or *no*). If a stressor occurred that day, participants rated the intensity of the relationship stress from 1 (*not at all stressful*) to 5 (*extremely stressful*). Participants reported the intensity of different relationship stressors for that day. Example stressors include "shouted at partner" and "questioned partner's fidelity." Participants reported whether these stressors occurred on each day of the daily surveys. A mean for the total amount of stress was calculated for each day in the study, and then a mean of the average daily stress was calculated for analysis. The mean daily relationship experience was 1.29 (*SD* = 1.60), ranging from 0 to 8.08. This scale displayed acceptable internal reliability (Cronbach's alpha = .75). Previous studies demonstrated this scale's validity (Langlais et al., 2023).

Social Media Use

Participants reported their frequency of social media use on the baseline survey. Participants answered the following questions: "How many minutes do you spend on social media daily?" Participants also indicated how much time they spent on specific social media platforms, which was used to confirm the number of minutes participants answered regarding total social media time. Examples of social media platforms, including Facebook, Instagram, Snapchat, X, and TikTok, were provided. The average number of minutes spent on social media was 105.47 (*SD* = 64.26), ranging from 5 to 240 minutes per day.

Ethical Considerations

This research was approved by the Institutional Review Board at Baylor University on January 13, 2024 (Study #212913-4). All participants provided their consent for participation. The consent form mentioned that participants could skip any questions that made them uncomfortable or stop participating. Participants were also provided the contact information for free mental health services in case they experienced duress as a result of the study.

Data Analysis

All analyses used structural equation modeling (SEM) via Mplus v8.0 (Muthén & Muthén, 2022). Mplus estimation procedures handle missing dating using full information maximum likelihood, which fits the covariance structure directly to the available data for each participant without relying on pairwise or listwise deletion, making this approach optimal for the available data (Kline, 2011). SEM tests relationships among primary constructs and can assess the magnitude and significance of exogenous and endogenous variables. An advantage to SEM is that it can simultaneously test for direct and indirect (i.e., mediated) effects, which is impossible with a regression approach. To address the study hypotheses, two path models were conducted: one for subjective measures of sleep (length of time sleeping, subjective measures of sleep onset latency, subjective measure of wake after sleep onset, and self-reported number of awakenings) and another for objective measures of sleep (time spent sleeping, sleep efficiency, wake after sleep onset, and sleep onset latency; all captured using the Oura ring). In these models, the direct effects of stress were captured on measures of objective and subjective sleep, and the indirect effect of social media was captured between stress and the measures of sleep quality. The Mplus estimation of indirect effects estimates indirect effects with delta standard errors (Muthén & Muthén, 2022). Before conducting these analyses, the data was examined for outliers. Based on this analysis,

two participants were dropped, given exceptionally high scores of social media use and relationship stress that were outside a 95% confidence interval of this data, resulting in a final sample of 35 participants providing more than 90% of data across two weeks (a total of 525-time points of data).

3. Results

Means, standard deviations, and correlations across study variables are presented in Table 1. The majority of participants identified as female (77.8%). The remaining participants identified as male (19.4%), although one did not disclose their gender. Many participants identified as heterosexual (88.9%). One participant did not disclose their sexual orientation, and three participants identified as bisexual (8.3%). The breakdown for ethnicity of participants was white/Caucasian (88.9%), Hispanic (5.6%), Asian (2.8%), and mixed (2.8%). Participants' romantic relationship status included one married participant (2.8%), one engaged participant (2.8%), two participants who were casually dating (5.6%), and 32 who were in serious dating relationships (88.9%).

Table 1. Means, standard deviations, and correlations of study variables.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. TST_{obj}	434.93	37.42	---	-.09	.55**	.35*	.16	.56**	.22	.09	-.17	.37*
2. SE_{obj}	88.76	2.87		---	-.12	-.93**	.27	-.21	-.36*	-.48**	.21	.22
3. SOL_{obj}	14.96	6.36			---	.27	-.03	.50**	.30	-.05	-.09	.39*
4. $WASO_{obj}$	56.70	19.06				---	-.25	.30	.32	.37*	-.27	-.10
5. TST_{sub}	455.13	54.78					---	-.02	.06	.09	.02	.04
6. SOL_{sub}	15.65	9.01						---	.50**	.28	.02	.25
7. $Awakenings_{sub}$	1.36	.85							---	.63**	-.19	.07
8. $WASO_{sub}$	8.07	7.16								---	-.12	.03
9. Sum of Daily Sleep Stress	3.56	.43									---	-.37**
10. Social Media Use	1.30	1.61										---

Note: TST = time spent sleeping; SE = sleep efficiency; SOL = sleep onset latency; WASO = wake after sleep onset. Quality of sleep was measured on a 1 to 5 scale, with higher scores indicating better quality sleep. Measures of daily relationship stress ranged from 0 to 5, and measures of trait relationship stress ranged from 0 to 3; for both scales, higher scores reflected more stress. * $p < .05$; ** $p < .01$.

Table 2. Tests of Mediation for Path Analyses Models

Paths	Total	Direct	Indirect	95% CI Indirect
Objective Sleep				
Stress --> Social Media Use --> TST_{obj}	.54	.53***	.01	[-.05 to .07]
Stress --> Social Media Use --> SE_{obj}	-.12	-.08	-.04	[-.23 to .16]
Stress --> Social Media Use --> $WASO_{obj}$	.04	.06	-.02	[-.09 to .30]
Stress --> Social Media Use --> SOL_{obj}	.18	.17	.01	[-.03 to .04]
Subjective Sleep				
Stress --> Social Media Use --> TST_{sub}	-.22	-.21	-.01	[-.55 to .11]
Stress --> Social Media Use --> SOL^{sub}	-.01	-.02	.01	[-.36 to .34]
Stress --> Social Media Use -->$WASO_{sub}$	-.26	-.23	-.03	[-.16 to .12]
Stress --> Social Media Use --> $Awakenings_{sub}$	.09	.12	-.03	[-.21 to .12]

Note: Bold paths highlight significant evidence of mediation. TST = time spent sleeping; SE = sleep efficiency; WASO = wake after sleep onset; SOL = sleep onset latency; OBJ = objective measure of sleep; SUB = subjective measure of sleep; CI = confidence interval. *p < .05; ** p < .01; *** p < .001.

The first hypothesis predicted that social media would mediate the relationship between relationship stress and objective sleep quality. Results for this model are presented in Figure 1. This model was saturated, displaying adequate fit. According to this model, stress did not predict social media use. However, social media use predicted decreases in SE_{obj} (B = -.59, $p < .001$) and increases in $WASO_{obj}$ (B = .45, $p < .01$). Additionally, relationship stress predicted increases in TST_{obj} (B = .44, $p < .01$). Stress was not directly associated with SE_{obj},

WASO$_{obj}$, or SOL$_{obj}$. Additionally, social media did not predict TST$_{obj}$ or SOL$_{obj}$. The results for indirect effects are presented at the top of Table 2.
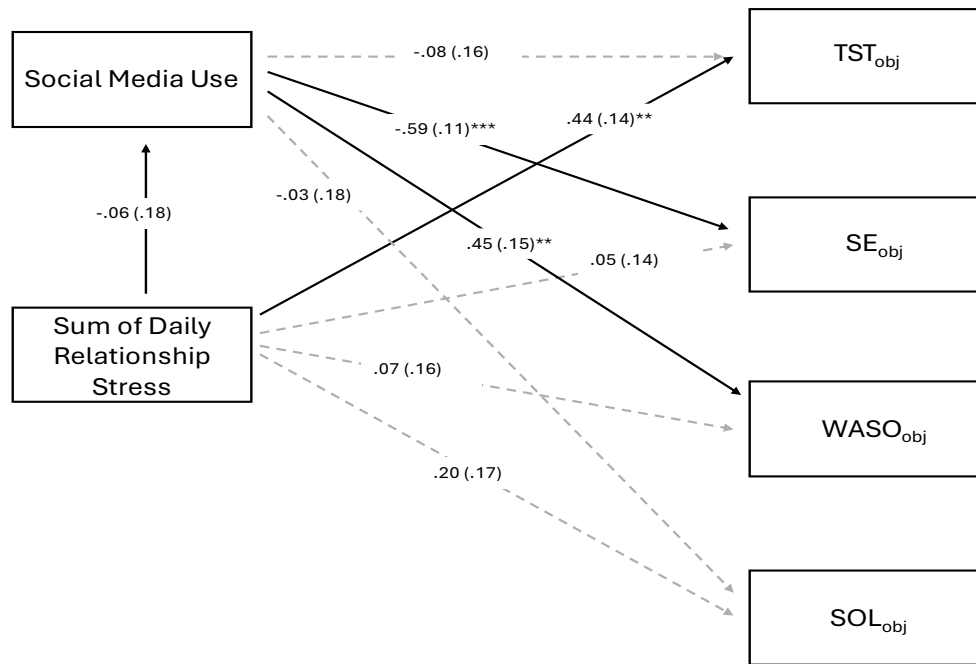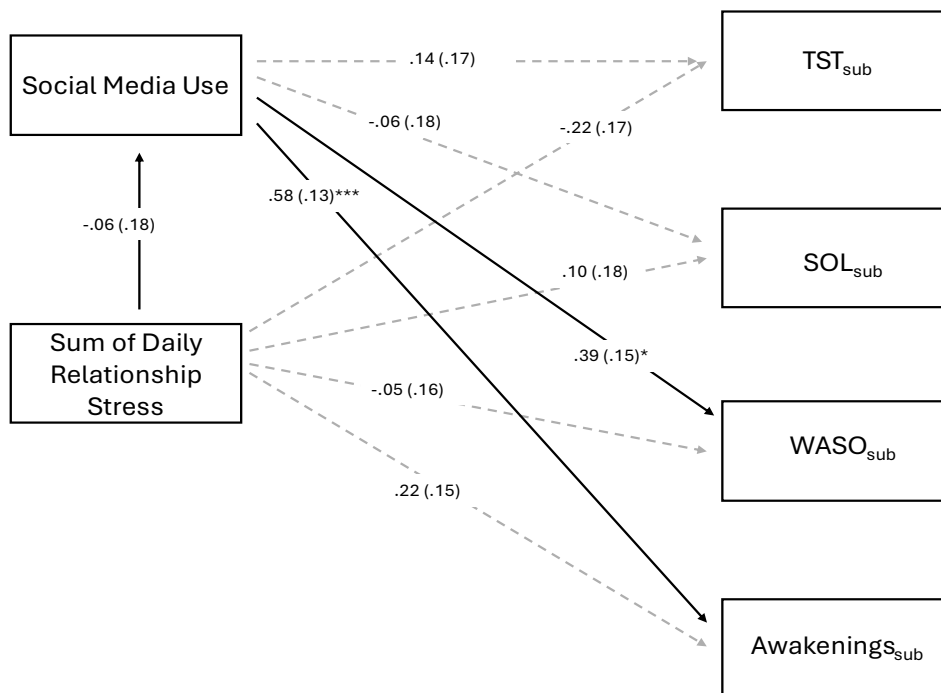

Figure 1. Results of path analysis predicting objective sleep.

Note: TST = time spent sleeping; SE = sleep efficiency; WASO = wake after sleep onset; SOL = sleep onset latency; OBJ = objective measure of sleep.

Figure 2. Results of path analysis predicting subjective sleep.

Note: TST = time spent sleeping; SE = sleep efficiency; WASO = wake after sleep onset; SOL = sleep onset latency; SUB = subjective measure of sleep.

According to this analysis, social media did not mediate the relationship between relationship stress or any measures of objective sleep quality. Additionally, there is no significant relationship between stress and social media use, which violates one of the conditions of mediation (Baron & Kenny, 1968). Therefore, the first hypothesis is not supported. The second hypothesis predicted that social media would mediate the relationship between relationship stress and subjective sleep quality. Results for this model are presented in Figure 2. According to this model, relationship stress did not predict social media use. Stress was not directly associated with any subjective measures of sleep quality (TST_{sub}, SOL_{sub}, $WASO_{sub}$, or $Awakenings_{sub}$). Social media use predicted increases in $WASO_{sub}$ (B = .39, $p < .05$) and number of $Awakenings_{sub}$ (B = .58, $p < .001$), but was not associated with SOL_{sub} or TST_{sub}. Results for the indirect effects are presented at the bottom of Table 2. Based on these analyses, there were no significant mediating effects. Thus, the second hypothesis is not supported.

4. Discussion

This study aimed to test if social media use mediated the relationship between romantic relationship stress and objective and subjective sleep quality. Social media use did not mediate the relationship between stress and sleep efficiency. However, relationship stress predicted increases in objective TST. Furthermore, greater daily social media use predicted reduced SE, increased WASO, and increased number of awakenings across participants. These results suggest independent effects of relationship stress and social media use on sleep quality without a mediating effect.

First, these results contradict Baumeister and Leary's (1995) need to belong. We predicted that sleep quality would be threatened during relationship stress because belongingness needs would be threatened. However, relationship stress was not associated with sleep quality with the participants in this study, which is counterintuitive to the literature reviewed (Kalmbach et al., 2018; Yap et al., 2020; 2021; 2022; 2024). There are some explanations for this inconsistent finding. First, participants were required to be in an established romantic relationship. Knowing that the study was about relationship stress and sleep, the recruited sample may be more likely to participate if they were in a healthier relationship. Even if they were to experience relationship stress, healthy couples may have been able to navigate the stress to assuage the negative effects of this stress (Randall et al., 2018). In this way, belongingness needs may not be threatened even when stress is experienced in relationships. Evidence for this can be seen in the low variability in daily relationship stress across the 14 days in the study. The current study did not control for conflict resolution or other ways of coping with relationship stress, which could explain the null finding. Additionally, there may have been other stressors that could be associated with sleep quality, such as school or work stress, which was not captured in this study (Haydon & Salvatore, 2023; Xie et al., 2024). Future studies should consider controlling for other types of stress as well as the quality of a relationship.

Part of the analytical models in this study tested the direct effect between relationship stress and social media use, where relationship stress did not predict social media use. Some studies have found that social media can cope with different stressors (Langlais et al., 2020; Sun et al., 2023). Participants in the current study may have sought support for their stress in other ways if they sought support at all. Individuals also use social media for many other reasons, including entertainment, to connect with others, and to keep up with current trends and news (von Fedak & Langlais, 2024). The direct relationship between relationship stress and social media use may be explained by other variables not controlled for in this study.

In contrast to what was initially hypothesized, relationship stress predicted greater TST_{obj}. These findings appear to counter previous findings, which indicate a negative impact of general stress (Yap et al., 2020) and relationship stress (Haydon & Salvatore, 2023) on sleep quantity and quality. However, the unstandardized coefficient of this relationship indicates that for every increase in 1 unit of relationship stress, there is a 2.23-minute increase in total sleep time. As the range of mean relationship stress spanned from 0-8.08, this indicates that those individuals who reported the highest levels of relationship stress only slept ~18 minutes longer than those with the lowest levels of relationship stress. Whether this magnitude of difference is meaningful, particularly in the absence of any discernible impact on sleep quality, is unknown. An increase in TST in participants with high self-reported relationship stress could also be attributed to other factors such as stress-induced fatigue (Doerr et al., 2015), healthy coping strategies (Haydon & Salvatore, 2023), among other factors that were not assessed in the present study.

Along with the direct association between relationship stress and total sleep time, social media use has been linked to decreased sleep quality. This relationship is evident when analyzing both objective measures of SEobj and WASOobj, as well as WASOsub and the number of awakenings, which supports the validity of the finding. These results align with previous research highlighting a strong connection between increased social media use and a higher risk of sleep disturbances in young adults (Levenson et al., 2016; 2017). The impact of social media on sleep is likely multifactorial. For example, negative experiences on social media are more closely associated with a greater risk of poor sleep than positive experiences (Rzewnicki et al., 2020), suggesting a role for the emotional valence of the material being viewed in sleep processes. Similarly, exposure to evening light from devices that access social media may impair melatonin secretion and sleep quality (Cajochen et al., 2011; Chang et al., 2015; West et al., 2011). While we did not assess the emotional valence or timing of social media use in the present study, future research could focus on untangling the intersection between relationship stress and specific aspects of social media use (i.e., timing in relation to bedtime, materials being viewed, emotional tone of viewed materials) to clarify the potential overlap between these variables.

Limitations and Conclusions

Although this study advances the literature on stress, social media use, and sleep quality, it has its limitations. First, the participants are relatively homogeneous, mainly white women who are either undergraduate or graduate students. This small sample size introduces risks for Type I and Type II errors, which could compromise the robustness of the analytical models. While we had sufficient statistical power for this study, future research should recruit a more diverse participant pool for better generalizability. Second, the frequency of relationship stress was predominantly low. This lack of variability may account for the absence of significant findings in the current study. Several explanations could clarify this lack of variability. Participants likely knew the study focused on romantic relationships and sleep quality, leading only those in strong relationships to enroll, limiting the range of romantic relationship stress. It would be more valid to capture relationships of varying quality to reflect a broader spectrum of romantic relationship stress. Third, as previously mentioned, gathering more specific measures of social media use would provide data that could aid in interpreting the results, such as daily reports on social media use and whether participants used it before going to bed and, if so, for how long. This information would help validate the findings of this study. Fourth, this research relied on the average relationship stress, social media use, and average objective and subjective sleep quality throughout the study. Because daily social media use was not captured, the simplified model limits opportunities for more advanced analyses like cross-lagged panel analyses. Given the exploratory nature of this study, it serves as a starting point to understand the roles of social media and stress in sleep quality. If daily variations were captured with social media use, cross-lagged panel analyses could have been conducted to test these same hypotheses in the future. Given the reliance on between-person predictions, we cannot determine causal paths in these predictive models. Fifth, the length of a romantic relationship was not captured, nor was the relationship quality. Capturing this information would have provided a stronger sense of how relationship stress contributes to sleep quality.

Despite these limitations, this study directly addresses a call from researchers to understand better why relationship stress impacts sleep quality (Xie et al., 2024). Contrary to our hypothesis, social media use did not serve to mediate any discernible association between relationship stress and sleep quality or quantity. Instead, social media use alone was a strong independent predictor of subsequent sleep quality. Future studies are encouraged to replicate these findings using more precise measures of social media use and more diverse samples of participants. By better understanding the relationship between romantic stress, social media use, and sleep quality, recommendations can be made to support healthy development via better sleep.

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