

THE ROLE OF NIGHT-TIME SOCIAL MEDIA USAGE IN MOOD DISORDERS AMONG TEENAGERS IN MALAYSIA: A CONCEPTUAL ANALYSIS

Aervina Misron^{1*}, Sharfika Raime², Alvin Anandkumar Daniel Ratnakumar¹, Vibiana Vincent Ravindran¹, Nur Azmina Amaluddin¹, Preveethah Rakunathan¹, Herenia Vincent¹, Helenjit Kaur Gorbachan Singh¹

¹Faculty of Business and Management, Quest International University, Perak, Malaysia

²City Graduate School, City University Malaysia, Selangor, Malaysia

*Corresponding author: aervina.misron@qiu.edu.my

Abstract: The rate of youth using social media and electronic devices at night has increased, suggesting a potential health risk associated with late-night or evening use of electronic devices, as individuals who engage in more late-night electronic activity will likely have a higher risk of having mood-related disorders such as an increase in depressive symptoms or anxiety. While there is considerable evidence of a relationship between excessive electronic use and increased levels of distress in relation to sleep, there is limited understanding of how specific late-night online behaviours of social interaction might impact the development of mood disorders among teenagers. The conceptual model established in this research serves to guide researchers in exploring how three specific behaviours (i.e., duration of night-time social media use, frequency of checking social media at night, time gap between last screen use) can have an impact on the development of several different moods relating to anxiety and depression. This research is founded on the Social Rhythm Theory. The current study will provide insights into the potential contributions of the research conducted on national level, along with possible testable hypotheses for future researchers to examine more deeply. The proposed conceptual model will also include the theoretical implications of how the concept of digital engagement relates to biological rhythms (circadian) in regulating behaviour and how the proposed conceptual model will give practical guidance to policymakers, educators, mental health providers, and parents, guardian to help reduce the risks of poor mental health associated with digital engagement in youth.

Keyword: Social Media Use, Mood Disorder, Mental Health, Malaysian Teenagers, Social Rhythm Theory

INTRODUCTION

The growth of digital technologies in Malaysia has brought a complete change in the way that the youth communicate, access their information and entertainment. Social networking sites such as TikTok, Instagram, WhatsApp, and YouTube are incorporated into almost all aspects of life and social interaction for teenagers and have influenced social interactions, peer dynamics, identity development, and emotional expression. Young Malaysian people, including those aged 13 to 17 years are among the highest digital users in all of Southeast Asia, with many indicating a strong dependence on their mobile smartphones and spending substantial amounts of time on their social media platforms, especially in the late-night hours (Malaysian Communications and Multimedia Commission, 2024). There are both opportunities for connection and creativity with social media, but also concerns regarding the negative effect on the wellbeing of teenagers as well.

The emerging pattern of night-time use of social media is an extremely important pattern of behaviour, especially when considering the association of night-time social media use with sleep disorders and emotional or behavioural dysregulation. A number of international and regional studies indicate an association between night-time or excessive amounts of screen use with a delay in sleep onset, decrease in sleep quality, and increased levels of cognitive and emotional arousal, disruption to circadian rhythm, which were predictors of the increased risk of anxiety, depression, irritability, and decreased academic performance (Levenson et al., 2017; Wong et al., 2021). Evidence suggests that Malaysian youth also face delayed sleep, excessive worry, and increased stress as a result of overusing digital devices, reflecting trends seen in the mental health studies conducted on a global scale (Ahmed et al., 2024; Zaw & Azenal, 2021). Although growing awareness of the potential impacts of these behaviours on mental health has occurred, social media behaviour research in Malaysia typically focuses on the overall use of social media rather than isolating the behaviours related to night-time social media use. In fact, research has included an examination of screen time and total frequency of social media use, without also zoning in on specific behaviours related to night-time social media use, such as the amount of time spent using social media at night (Scott et al., 2019), the number of times that adolescents and young adults check social media at night (which is referred to as nocturnal checking) and the amount of time between the last time that a youth is on a screen before sleeping (the pre-sleep screen interval) (Bowers & Moyer, 2017; Wong et al., 2021).

Past research focuses on the total amount of time spent on screens or how often users check their social media accounts and thus fails to analyse specific aspects of individuals' night-time digital use, such as how much time they spend on screens, how frequently they check social media, and how long they spend using screens before bed. A study by Scott et al. (2019) found that teenagers who frequently check their phones during the night will have disrupted sleep and increased levels of emotional arousal. Additionally, Sennock et al. (2024) found that those who spend less than one hour using their phones before going to bed report delayed onset of sleep, decreased sleep quality, and increased rates of anxiety and depression, which focus on measuring overall social media usage rather than on examining how people are using social media during the night.

In Malaysia, issues of mental health for teenagers are becoming increasingly prevalent. Recent research indicates that youth in Malaysia, including those aged 13-17, have an increased prevalence of anxiety and depression. Therefore, it is crucial that the Malaysian public health sector pay close attention to these symptoms (Samsudin et al., 2024; Suhaimee et al., 2025). There are many studies linking social media and its effects on the mental health of Malaysian youth including teenagers. It is thought that excessive social media use may contribute to increased feelings of anxiety and depression in the youth population (Victor et al., 2023). Given the amount of time youth spend on social media and its correlation to sleep patterns, it is essential to begin researching how using social media during the night time hours affect the mental well-being of teenagers in Malaysia. This understanding is critical in developing educational programs to detect early signs of mental health problems, as well as developing public health initiatives in Malaysia to ensure that children and young adults have positive mental health.

This conceptual paper proposes the development of a conceptual model to explain the relationships between night-time social media behaviours, discussing how night-time social media behaviours may be related to the development of mood disorder symptoms among teenagers in Malaysia. Furthermore, this model is grounded on Social Rhythm Theory, where future empirical studies extending this conceptual framework will be supported by this theory to guide ways of developing future digital practices to improve the mental health of teenagers in Malaysia.

PROBLEM STATEMENT AND RESEARCH GAP

Despite the growing body of international literature documenting the link between excessive social media use and problems with mental health, little attention has been paid to the patterns of use that occur at night time, which have the strongest association with biological and emotional vulnerability (Scott & Woods, 2018). Many teenagers spend large amounts of time on social media platforms scrolling through content and participating in emotionally stimulating interactions late into the night, which leads to sleep deprivation and disruption of their circadian rhythms (Chiu et al., 2021). There is strong evidence that poor sleep quality is a significant risk factor for increased anxiety, depression, irritability, and weakened academic performance (Becker & Gregory, 2020; Short et al., 2020). In Malaysia, where digital engagement is high and mental health literacy is relatively low, the development of these behaviours will pose a particularly large amount of risk (Maskun et al., 2025; Wong et al., 2021). Nonetheless, there is limited research conducted in Malaysia that isolates the night-time behaviours of social media use, or examines whether there is a conceptual relationship between night-time social media behaviours and symptoms of mood disorders; therefore, targeted prevention strategies cannot be developed.

Most previous studies in this area tend to focus on social media activity rather than directly isolating users' social media night-time behaviour. The evidence suggests that social media activity done at night has the highest negative effect on sleep and emotional well-being (Scott et al., 2019; Levenson et al., 2017; Wong et al., 2021). The amount of time spent on social media at night, frequency of checking social media at night, and duration before sleep are rarely addressed together within past research (Carter et al., 2016). In addition, a majority of the research has also considered regular social media behaviours as an independent variable versus as a cumulative impact on an individual. Evidence suggests that cumulative exposure to social media at night is related to emotional stress and dysregulation (Bild et al., 2025; Odgers & Jensen, 2020). Additionally, the majority of Malaysian research in this area has focused on general populations or university students with little attention on teenagers as a distinct high-risk population for social media-related problems (Zaw & Azenal, 2021; Wong et al., 2021; Ahmed et al., 2024). Therefore, this conceptual analysis presents a conceptual framework that integrates night-time social media behaviours and mood disorders among teenagers using pathways of disruption to their rhythmic cycles.

RESEARCH QUESTIONS

Based on the background of this study, together with the identified issues and research gaps, this study aims to address the following research questions (RQ):

- RQ1: What is the relationship between the duration of night time social media use and mood disorder symptoms among teenagers in Malaysia?
- RQ2: What is the relationship between the frequency of checking social media at night and mood disorder symptoms among teenagers in Malaysia?
- RQ3: What is the relationship between the time gap between last screen use and mood disorder symptoms among teenagers in Malaysia?

RESEARCH OBJECTIVES

In line with the research questions, this study formulates both general and specific research objectives (RO), as follows:

General Objective

The general objective of this study is to develop a conceptual framework that will help understand the relationship between social media activity during the night and mood disorder symptoms among Malaysian teenagers.

Specific Objectives

Based on the research questions, the research objectives state the main goals and intentions of this study, which are specified as follows:

- RO1: To determine the relationship between the duration of night time social media use and mood disorder symptoms among teenagers in Malaysia.
- RO2: To evaluate the relationship between the frequency of checking social media at night and mood disorder symptoms among teenagers in Malaysia.
- RO3: To examine the relationship between the time gap between last screen use and mood disorder symptoms among teenagers in Malaysia.

HYPOTHESIS OF THE STUDY

Based on the research objectives and the proposed conceptual framework, the following hypothesis are formulated:

- H1: There is a positive significant relationship between the duration of night time social media use and mood disorder symptoms among teenagers in Malaysia.
- H2: There is a positive significant relationship between the frequency of checking social media at night and mood disorder symptoms among teenagers in Malaysia.
- H3: There is a positive significant relationship between the time gap between last screen use and mood disorder symptoms among teenagers in Malaysia.

SCOPE OF THE STUDY

This conceptual analysis investigates how teenagers' engagement with social media at night relate to the symptoms of mood disorder, with Social Rhythm Theory framing this analysis. Social Rhythm Theory posits that stable biological rhythms and social daily rhythms are important for emotional stability. Therefore, social media use at night represents a type of behaviour that may disrupt these biological and social rhythms, which would interfere with sleep or wake cycles and emotional regulation. There are three independent variables (IVs) in this study: duration of night time social media use (IV1), as indicated by the amount of time spent on social media between late evening and just before sleep; frequency of checking social media at night (IV2), as it reflects habitual, repetitive engagement with social media that may increase cognitive and emotional activation; and the time gap between last screen use (IV3), which reflects the degree to which social media engages with the wind-down period of biological processes prior to sleep.

Mood disorder symptoms as the dependent variable (DV) include anxiety, depression, irritability, and emotional dysregulation, giving special emphasis to subclinical types of mood disorders that are often experienced by teenagers. Consistent with Social Rhythm Theory, the mood-related outcomes associated with use of social media after hours are viewed as chronic disruptions to the social and physical rhythms of daily life caused by poor or inconsistent engagement in social media use at night. This analysis takes place in the context of Malaysia and focuses on teenagers, with particular emphasis on those aged 13 to 17 years, where this age delineation reflects both the internationally recognised definition of teenagers provided by the World Health Organization (2025) and local Malaysian health and demographic classifications (Ministry of Health Malaysia, 2025), thereby ensuring that the study remains contextually and developmentally relevant to the Malaysian teenage population. By integrating Social Rhythm Theory with a clear indication of social media usage at night, this study provides an explicit conceptual scope for better understanding the positive relationship of disrupted digital rhythms to symptoms of mood disorder development.

SIGNIFICANCE OF THE STUDY

This study carries both theoretical and practical significance:

Theoretical Significance

This study extends the field of digital mental health research through the contribution of Social Rhythm Theory in combination with contemporary digital behaviours. It defines the use of social media late at night as a disruption to regular cyclical sleep patterns, which creates increased vulnerability to developing mood disorders. This represents an extended conceptualisation of sleep disruption as an additional element of vulnerability to the effects of screen time on teenagers to more nuanced, and theoretically based understanding.

Practical Significance

The conceptual framework developed for this study has implications for educators, clinicians, parents and policy-makers. By examining how sleep patterns affect risk for developing mental health conditions by what behaviours increase that risk, all would be able to create effective strategies for digital wellbeing education, digital interventions for mental health, and raise public awareness about the risks of social media use late at night. Schools can develop and promote sleep hygiene and digital mindfulness programs, whereas parents would likely establish boundaries around device usage before bedtime. Additionally, policy-makers may be able to leverage this conceptual framework when developing national strategies for youth mental health.

LITERATURE REVIEW

Duration of Night-Time Social Media Use

The amount of time someone spends on social media during late-nights or early-hours (between 10 pm and about 6 am) is considered to have a direct relationship to their sleep quality. Using social media late into the evening will cause problems with your sleep in three major areas (circadian rhythms or light influence, time displacing bedtime or less total amount of sleep, and creating a sense of physical alertness before sleeping), all of which can be problematic for people who want to maintain a good night's sleep. In addition, recent studies suggest that the circadian is supported by the experimental and mechanistic data found in these studies (Levenson et al., 2017; Bild et al., 2025). Use of smartphones or mobile electronic devices (including use of electronic devices that emit blue light) will reduce the amount of melatonin produced in your body at night, and it is understood that if users stop using their smartphone or other devices at least 50 minutes prior to going to bed, they may reduce the amount of melatonin reduction and reduce the potential for physiological disruption to the body while sleeping (Höhn et al., 2024).

The growing body of evidence from large empirical studies supports the association between increased social media use and negative mental health outcomes, particularly symptoms of depression. As time spent on social media increases over time, these studies allow researchers to begin to explore the temporal relationship using longitudinal data. For example, longitudinal studies using cohort methodology indicate that an individual's increasing use of social media during their early teenage years is predictive of greater levels of depression at a later date (Nagata et al., 2025). This helps to provide additional support for the idea that greater amounts of time spent on social media not only correlates with distress, but also has the potential to cause depressed mood in the future. It has also been established through meta-analytic designs that across multiple countries around the world, there is a statistically significant and reliable association between electronic media use and negative sleep patterns and sleep quality (Han et al., 2024). Additionally, in Malaysia, studies have found that greater amounts of screen time for teenagers are positively related to both anxiety and depression, and that poor sleep quality is an important factor that relates to teenagers' health in the same high-engagement environment that exists in Malaysia (Mohd Saat et al., 2024).

Frequency of Checking Social Media at Night

In addition to "how long", the frequency of teenagers' access to and use of social media during the night follows a fragmented micro-pattern of engagement (multiple brief sessions, multiple times a night, triggered by notifications). The timing and rhythm of these behaviours are important because they may lead to greater cognitive arousal on a pre-sleep basis (e.g., anticipating, worrying, monitoring) and, as such, may increase the amount of time individuals will be awake or delay the time when they actually go to sleep. Studies analysing the use of social media at night provide supporting evidence that FoMO (fear of missing out), as well as cognitive arousal (pre-sleep) both influence a reduction in sleep quality (Almeida et al., 2022). Therefore, the cumulative effect of engaging in the behaviours associated with checking (frequency) versus just how long one engages (duration) demonstrates how those behaviours disrupt one's ability to get good night's sleep.

Recent studies of sleep behaviour have also separated out the specific behaviours (e.g., checking) that take place just before bedtime into a separate category, as opposed to just measuring total screen time for the day, and indicated that these behaviours can predict sleep problems (Nagata et al., 2024). From the perspective of digital psychology, repeated checking behaviour operates under the same reinforcement cycle (i.e., intermittently receiving messages or updates), as well as being motivated by an individual's emotional need to be reassured by others, can place teenagers at a higher level of arousal when their bodies should be going to sleep, contributing to the development of chronic sleep problems and emotional problems that can arise as a result of regulatory problems following chronic sleep problems (Yu et al., 2024).

Time Gap Between Last Screen Use

The amount of time between teenagers' last use of social media and when they fall asleep (pre-sleep screen time) demonstrates how much time screen usage interferes with their natural biological process of getting ready to sleep. When the gap between last use of the social media and going to bed is small, that means that the teenagers is going right from using something that may be stimulating their brain and their emotions directly into trying to fall asleep, consequently, they have an increased chance of falling asleep later than they intended to, having lower quality sleep and being out of sync with their circadian rhythms. Research has indicated that using a smartphone at night or being exposed to light from a screen can alter melatonin secretion, affect sleep patterns and that younger people are particularly susceptible to light-altered circadian cycles (Höhn et al., 2024).

In addition, preliminary evidence shows that pre-sleep cognitive arousal is associated with the connection between late-night use and poor sleep quality, therefore, the "last use" being close in time to bedtime creates maximum arousal and minimum recovery time (Almeida et al., 2022). In moderate control studies of fixed-style experiments for a brief period of exposure, few report any conclusive support, however, the continuing larger data base, including meta-analyses, shows a strong and significant association between electronic media use and an increase in poor sleep quality, so it is reasonable to speculate that what has not shown to exist in controlled studies likely exists in real life due to variability of the time period between use and bedtime, the number of times a person checks their phone before going to sleep, and the potential for using a phone or other device as an emotionally arousing medium (Sennock et al., 2024).

Mood Disorder Symptoms

Mood disorder symptoms, such as depression, anxiety, irritability, and emotional dysregulation, have been increasing globally. Evidence from multiple sources indicates that most digital behaviours, especially those close to or during sleep (known as "bedtime" behaviours), have a negative relationship with mood symptom severity, implicating sleep as the main pathway for this negative relationship (Höhn et al., 2024; Yu et al., 2024). Longitudinal and systematic reviews of the literature show that there is increasing evidence of the link between social media use and sleep disturbances (i.e., insomnia-like and poor-quality sleep) for youth that later develop into depressive or anxiety symptoms (Ahmed et al., 2025).

In Malaysia, screen time has positively correlated with depression and anxiety among children. Therefore, the findings are relevant because they highlight the extent to which mood disorder symptoms are associated with "overall use" of social networking sites or social media, and may be largely impacted by behaviours that take place during the night-time, which lead to disruption of sleep patterns and daily rhythms, which can affect developmental processes during adolescence and early adulthood (Nagata et al., 2025). The literature supports the conclusion that mood disorder symptoms are not only correlated with overall use of social media, but are likely to be most sensitive to behaviours during the night-time that create disturbances in sleep patterns and daily rhythms, which can have large implications for the development of mood disorder symptoms among teenagers.

HYPOTHESIS DEVELOPMENT

Duration of Night-Time Social Media Use and Mood Disorder Symptoms

Night-time social media activity may lead to increased mood-related symptomology through two main mechanisms: firstly, extended exposure and use of social media delaying the time of night when users go to bed and having them sleep less because of it (time displacing), and additionally, the subsequent disruption of the body's natural circadian rhythm (physiological disruption) by means of exposure to light emitted from electronic devices and arousal from usage (Höhn et al., 2024). This notion is supported by mechanistic data indicating that smart phone and light exposure at night (responsible for both melatonin secretion changes and sleep physiology), along with population studies that find that the more time spent on social media, the more likelihood there is to develop later depressive symptoms during teenage years, provides context for a likely positive link between time spent on social media and mood related disorders in Malaysia (Mohd Saat et al., 2024; Mourya, 2025). Thus, it is proposed that:

H1: There is a positive significant relationship between the duration of night time social media use and mood disorder symptoms among teenagers in Malaysia.

Frequency of Checking Social Media at Night and Mood Disorder Symptoms

Regularly checking social media accounts during the evening can disrupt normal sleeping pattern, increasing level of anxiety (due to the constant notifications receive), increasing level of anticipation for friends' posts and need to know what is happening at all times, as well as making it difficult to get back to sleep after waking up. The use of social media at night has also been linked to feelings of FoMO, which leads to increased cognitive activity prior to falling asleep (Almeida et al., 2022). These cognitive pre-sleep arousal levels are likely contributing to decreased sleep quality and thus, increased emotional reactions to situations occurring during the day or evening. Additionally, studies have shown that many of the key behaviours associated with bedtime screen time are also associated with sleep-related health problems such as depression (Nagata et al., 2024). Hence, it is proposed that:

H2: There is a positive significant relationship between the frequency of checking social media at night and mood disorder symptoms among teenagers in Malaysia.

Time Gap Between Last Screen Use and Mood Disorder Symptoms

Circadian rhythms and arousal effect will be amplified through a shorter duration between the end of the day and the start of sleep because a shorter duration allows less time for the physiology to "wind-down" and for cognitive ability to disengage after a long day. It has been documented that light exposure to smartphones and other devices in the evening will disrupt the natural clock and whether or not an individual produces enough melatonin for adequate rest from light exposure (Höhn et al., 2024). Additionally, social media use at night is

linked to excessive cognitive arousal and lack of sleep quality for an individual, and there is a close association between poor sleep and the development of mood symptoms (Ahmed et al., 2025). Therefore, it is postulated that:

H3: There is a positive significant relationship between the time gap between last screen use and mood disorder symptoms among teenagers in Malaysia.

Social Rhythm Theory

According to Social Rhythm Theory, health maintenance behaviour is influenced by the regularity of daily routines, or Social Rhythms. These routines, which include sleeping, waking, eating, and socialising, provide external time cues that aid in the physiological stabilisation of circadian rhythm. Disruptions to social rhythms, particularly irregularities in the sleep or wake cycle, are positively correlated with an increased susceptibility to mood disorders such as depression and anxiety (Agyapong-Opoku et al., 2025; Song et al., 2024). Social Rhythm Theory was developed by practitioners in clinical psychology working with mood disorders and has more recently been shown to help understand lifestyle disruptions, such as those caused by digital technology and changes in social behaviours within modern society (Agyapong-Opoku et al., 2025; Braund et al., 2022).

In adolescence, night-time media social usage is a significant and growing contributor to Social Rhythm disruption. Night-time media social activities, such as late-night engagement with digital social media platforms, can interfere with bedtime, impede sleep, and increase emotional and cognitive arousal during periods typically reserved for physiological recovery. Consequently, these behaviours contribute to an unstable and impaired Circadian Rhythm and disrupt the emotional regulation process, making adolescents more vulnerable to mood disorder symptoms. Empirical studies have shown that adolescents in Malaysia who use digital social media problematically experience decreased sleep quality and increased psychological distress and negative emotional outcomes, with sleep disruption serving as a major mediating mechanism (Mohd Saat et al., 2024; Norasid & Ashaari, 2024). Therefore, there is strong conceptual support for the proposition that nighttime social media use is a rhythm-disrupting behaviour that leads to decreased emotional stability in Malaysian teenagers.

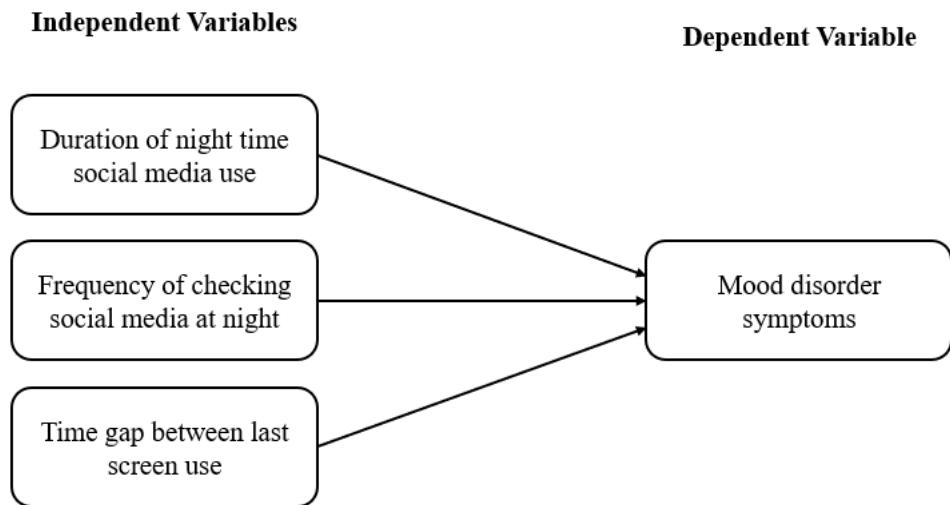
CONCEPTUAL FRAMEWORK AND UNDERPINNING THEORY

This study is grounded by Social Rhythm Theory, which is a psychological model that explains the relationship between emotional stability and physical health through the regularity of social and physical behaviours throughout the day (sleep, wake, eating, socialising) and their effect on our mental state (Frank et al., 1997). Social Rhythm Theory states that disruptions to these rhythms lead to instability in the circadian rhythms, which control the hormone release, sleep and wake cycle, and neurobiological processes related to mood. It has been shown that when rhythms of social behaviour are disrupted (by irregularities or fragmentation), the body's internal clock gets out of sync and individuals become more vulnerable to experiencing mood disorders,

especially depression and anxiety (Frank et al., 2000). Figure 1 presents the proposed conceptual framework of this study which aim to conceptualise the relationship between independent and dependent variables.

Figure 1

Conceptual Framework



RESEARCH IMPLICATIONS

This study builds on Social Rhythm Theory by investigating how social media fits into the lives of teenagers. The study aims to define how social media disrupts rhythms by examining the disruption caused by social media at night and describes the newest social media approaches as a rhythm disruptor. Furthermore, the proposed model includes digital behaviours that will be impactful on how electronic communication (social media) affects rhythms of biological and emotional disturbance (emotional well-being). In addition, the research advances the Social Rhythm Theory by identifying separate rhythms associated with behaviours. The separation of rhythms allows researchers to analyse each rhythm as an independent behaviour and understand what behaviours and patterns are most strongly related to emotional disturbance. The proposed conceptual framework encourages researchers to explore social rhythm disruptions caused by technological influences and researchers may consider using this model when conducting research focused on social rhythms for populations not considered clinically impaired or for those culturally diverse.

From a practical perspective, this research highlights several stakeholders who have a vested interest in teenagers' mental health and digital well-being. The empirical findings of this study may support the need for school systems to incorporate sleep health curriculum and digital well-being to educate teenagers on how to limit screen time, to understand the timing and frequency of social media use at night, and to establish boundaries for social media. Parents or guardians should establish consistent digital boundaries within their households that allow teenagers to limit checking social media multiple times during the night and to encourage adequate wind-

down time prior to going to bed. Clinicians may benefit from assessing the use of social media at night during the assessment of mood-related risk among teenagers, that social media behaviours may serve as indicators of the disruption of sleep or of teenager's emotional vulnerability. Policymakers should establish an evidence-based rationale for digital youth well-being strategies, which not only limit the number of hours that teenagers spend on their devices but which also provide recommendations related to when they should stop using social media and when they should start their electronic devices' wind-down time, which supports community and national efforts to promote healthy digital rhythms and improved psychological well-being among teenagers.

CONCLUSION

Through an integration of Social Rhythm Theory and digital behaviour constructs, this conceptual paper presents a conceptual model to describe how late-night engagement with social media by teenagers may lead to risk of mood disorder symptoms as a result of disrupted biological and social rhythms. It is suggested that the process of late-night digital behaviour is correlate with the disruption of the biological and social rhythm by digital behaviours, and therefore findings from the proposed hypotheses may inform future empirical work for the Malaysian context where limited data are available. Overall, the present conceptualisation demonstrates the necessity of providing intervention and preventative mental health strategies for youth related to the use of digital media.

ACKNOWLEDGEMENTS

The authors would like to express their sincere appreciation to all individuals who contributed, directly or indirectly, to the completion of this study. The authors also acknowledge the support and encouragement provided by Quest International University and City University Malaysia, which facilitated the conduct of this research.

DISCLOSURE STATEMENT

The authors report no potential conflict of interest with respect to the research, authorship or publication of this article.

ORCID

Aervina Misron ID: <https://orcid.org/0009-0006-5104-2800>

Sharfika Raime ID: <https://orcid.org/0000-0003-2649-0610>

REFERENCES

Agyapong-Opoku, N., Agyapong-Opoku, F., & Greenshaw, A. J. (2025). Effects of social media use on youth and adolescent mental health: A scoping review of reviews. *Behavioral Sciences*, 15(5), 574.

Ahmed, O., Dawel, A., Walsh, E., & Cherbuin, N. (2025). Longitudinal associations between problematic social media use and mental health: Mediating role of sleep. *Addictive Behaviors*, 108446.

Almeida, F., Marques, D. R., & Gomes, A. A. (2023). A preliminary study on the association between social media at night and sleep quality: The relevance of FOMO, cognitive pre-sleep arousal, and maladaptive cognitive emotion regulation. *Scandinavian journal of psychology*, 64(2), 123-132.

Becker, S. P., & Gregory, A. M. (2020). Editorial Perspective: Perils and promise for child and adolescent sleep and associated psychopathology during the COVID-19 pandemic. *Journal of Child Psychology and Psychiatry*, 61(7), 757-759.

Bild, E., Rossa, K. R., Edmed, S. L., Pattinson, C. L., Mann, D. L., Sullivan, K. A., ... & Smith, S. S. (2025). Effects of Smartphone Use on Sleep and Mental Health in Young Adults: Going Beyond Self-Report. *Depression and Anxiety*, 2025(1), 3249012.

Bowers, J. M., & Moyer, A. (2017). Effects of school start time on students' sleep duration, daytime sleepiness, and attendance: a meta-analysis. *Sleep health*, 3(6), 423-431.

Braund, T. A., Boonstra, T. W., Wong, Q. J., Larsen, M. E., Christensen, H., Tillman, G., & O'Dea, B. (2022). Smartphone sensor data for identifying and monitoring symptoms of mood disorders: a longitudinal observational study. *JMIR Mental Health*, 9(5), e35549.

Carter, B., Rees, P., Hale, L., Bhattacharjee, D., & Paradkar, M. S. (2016). Association between portable screen-based media device access or use and sleep outcomes: a systematic review and meta-analysis. *JAMA pediatrics*, 170(12), 1202-1208.

Chiu, N. K., Ehgoetz Martens, K. A., Mok, V. C., Lewis, S. J., & Matar, E. (2021). Prevalence and predictors of mood disturbances in idiopathic REM sleep behaviour disorder. *Journal of Sleep Research*, 30(2), e13040.

Frank, E., Hlastala, S., Ritenour, A., Houck, P., Tu, X. M., Monk, T. H., ... & Kupfer, D. J. (1997). Inducing lifestyle regularity in recovering bipolar disorder patients: results from the maintenance therapies in bipolar disorder protocol. *Biological Psychiatry*, 41(12), 1165-1173.

Frank, E., Swartz, H. A., & Kupfer, D. J. (2019). Interpersonal and social rhythm therapy: managing the chaos of bipolar disorder. *Bipolar Disorder*, 257-268.

Han, X., Zhou, E., & Liu, D. (2024). Electronic media use and sleep quality: updated systematic review and meta-analysis. *Journal of Medical Internet Research*, 26, e48356.

Höhn, C., Hahn, M. A., Gruber, G., Pletzer, B., Cajochen, C., & Hoedlmoser, K. (2024). Effects of evening smartphone use on sleep and declarative memory consolidation in male adolescents and young adults. *Brain Communications*, 6(3), fcae173.

Malaysian Communications and Multimedia Commission. (2024). *Internet Users Survey 2024*. Malaysian Communications and Multimedia Commission. <https://www.mcmc.gov.my/skmmgovmy/media/General/IUS-2022.pdf>

Maskun, R., Khairi, S. M. M., Sulaiman, M. N. A., Aris, N. M., Omar, M. M., & Mohamed, M. N. (2025). Digital Wellbeing Among Generation Y in Malaysia: Implications, Challenges, and the Path Forward. *Asia Pacific Journal of Business, Humanities and Education*, 10(1), 44-57.

Ministry of Health Malaysia. (2025). *National adolescence health policy*. https://hq.moh.gov.my/bpkk/images/3.Penerbitan/2.Orang_Awam/7.Kesihatan_Remaja/2.PDF/1.Dasar_dan_Pelan_Tindakan/1Dasar_Kesihatan_Remaja_Negara.pdf

Mohd Saat, N. Z., Hanawi, S. A., Hanafiah, H., Ahmad, M., Farah, N. M., & Abdul Rahman, N. A. A. (2024). Relationship of screen time with anxiety, depression, and sleep quality among adolescents: a cross-sectional study. *Frontiers in Public Health*, 12, 1459952.

Mourya, R. K. (2025). Social Media Usage and Its Influence on Student Mental Health: A Study Among University Students in Southeast Asia. *Asian Journal of Education and Society P ISSN-3117-3152 E ISSN-3117-3160*, 17-24.

Nagata, J. M., Cheng, C. M., Shim, J., Kiss, O., Ganson, K. T., Testa, A., & Baker, F. C. (2024). Bedtime screen use behaviors and sleep outcomes in early adolescents: a prospective cohort study. *Journal of Adolescent Health*, 75(4), 650-655.

Nagata, J. M., Otmar, C. D., Shim, J., Balasubramanian, P., Cheng, C. M., Li, E. J., ... & Baker, F. C. (2025). Social media use and depressive symptoms during early adolescence. *JAMA Network Open*, 8(5), e2511704-e2511704.

Norasid, S. N., & Ashaari, M. F. (2024). A Systematic Review of The Impact of Social Media Use on Mental Health in Malaysia. *Al-Hikmah*, 16(1), 1-21.

Odgers, C. L., & Jensen, M. R. (2020). Annual research review: Adolescent mental health in the digital age: Facts, fears, and future directions. *Journal of Child Psychology and Psychiatry*, 61(3), 336-348.

Samsudin, S., Ismail, R., Daud, S. N. M., & Yahya, S. (2024). The prevalence and underlying factors of mental health disorders in Malaysian youth. *Journal of Affective Disorders Reports*, 15, 100706.

Scott, H., & Woods, H. C. (2018). Fear of missing out and sleep: Cognitive behavioural factors in adolescents' nighttime social media use. *Journal of adolescence*, 68, 61-65.

Scott, H., Biello, S. M., & Woods, H. C. (2019). Social media use and adolescent sleep patterns: cross-sectional findings from the UK millennium cohort study. *BMJ open*, 9(9), e031161.

Sennock, S., und Wilkau, K. V. L., Günther, A., Brandhorst, I., Zinke, K., Conzelmann, A., Renner, T. J., & Kurz, E. M. (2024). Investigation of the influence of 45-minute pre-sleep social media use on sleep quality and memory consolidation in adolescents. *Sleep Medicine*, 124, 299-307.

Short, M. A., Booth, S. A., Omar, O., Ostlundh, L., & Arora, T. (2020). The relationship between sleep duration and mood in adolescents: A systematic review and meta-analysis. *Sleep medicine reviews*, 52, 101311.

Suhaimee, H. S., En, P. Q., Revindran, S., Rashid, A., Ariff, W. M., & Md Isa, Z. (2025). The Relationship Between Social Network Usage and Mental Health Among Youths in Klang Valley, Malaysia. *Pertanika Journal of Social Sciences & Humanities*, 33(1).

Victor, S. A., Ibrahim, M. S., Yusuf, S., Mahmud, N., Bahari, K. A., Yoke Ling, L., & Abd Mubin, N. N. (2024). Social media addiction and depression among adolescents in two Malaysian states. *International Journal of Adolescence and Youth*, 29(1), 2292055.

Wong, L. P., Alias, H., Md Fuzi, A. A., Omar, I. S., Mohamad Nor, A., Tan, M. P., ... & Chung, I. (2021). Escalating progression of mental health disorders during the COVID-19 pandemic: Evidence from a nationwide survey. *PloS one*, 16(3), e0248916.

World Health Organization. (2025). *Adolescent health – Southeast Asia*. <https://www.who.int/southeastasia/health-topics/adolescent-health>

Yu, D. J., Wing, Y. K., Li, T. M., & Chan, N. Y. (2024). The impact of social media use on sleep and mental health in youth: a scoping review. *Current psychiatry reports*, 26(3), 104-119.

Zaw, C. C., & Azenal, N. A. (2021). Association between social media addiction and mental health among International Islamic University Malaysia (IIUM) undergraduate nursing students. *INTERNATIONAL journal of care scholars*, 4(Suppl), 32-39.