

Testing a Structural Model of Social Media Addiction, Sleep Quality, Academic Burnout, and Psychological Well-Being among High School Students

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ABSTRACT

Objective: This study aimed to test a structural model explaining the direct and indirect relationships among social media addiction, sleep quality, academic burnout, and psychological well-being among high school students in Canada.

Methods and Materials: This cross-sectional correlational study was conducted among 718 high school students from Ontario, Canada, during the 2025–2026 academic year. Participants were selected through multistage cluster sampling from public high schools and completed standardized self-report questionnaires. Social media addiction was measured using the Bergen Social Media Addiction Scale, sleep quality was assessed using the Pittsburgh Sleep Quality Index, academic burnout was measured using the Maslach Burnout Inventory–Student Survey, and psychological well-being was assessed using Ryff’s Psychological Well-Being Scale. Data were analyzed using SPSS version 29 and AMOS version 29. Descriptive statistics, Pearson correlation coefficients, confirmatory factor analysis, and structural equation modeling were used. Model fit was evaluated using χ^2/df , CFI, TLI, GFI, RMSEA, and SRMR. Indirect effects were examined through bootstrapping with 5,000 resamples.

Findings: The structural model showed acceptable fit to the data ($\chi^2/df = 2.12$, CFI = .957, TLI = .951, GFI = .924, RMSEA = .039, SRMR = .041). Social media addiction significantly predicted poorer sleep quality ($\beta = .52$, $p < .001$), higher academic burnout ($\beta = .39$, $p < .001$), and lower psychological well-being ($\beta = -.24$, $p < .001$). Poor sleep quality significantly predicted academic burnout ($\beta = .31$, $p < .001$) and psychological well-being ($\beta = -.18$, $p < .001$). Academic burnout was the strongest direct predictor of psychological well-being ($\beta = -.49$, $p < .001$). Bootstrapping confirmed significant indirect effects through sleep quality, academic burnout, and the serial pathway from sleep quality to academic burnout.

Conclusion: The findings indicate that social media addiction undermines psychological well-being among high school students both directly and indirectly through impaired sleep quality and increased academic burnout. School-based interventions should integrate digital behavior regulation, sleep hygiene education, and burnout prevention strategies.

Keywords: Social media addiction; Sleep quality; Academic burnout; Psychological well-being; High school students; Structural equation modeling.

1. Introduction

Psychological well-being has become one of the most important indicators of healthy adolescent development in contemporary educational and psychological research. Psychological well-being extends beyond the absence of mental illness and encompasses positive functioning, life satisfaction, self-acceptance, meaningful relationships, personal growth, environmental mastery, and a sense of purpose in life. During adolescence, psychological well-being is particularly important because this developmental period is characterized by substantial biological, cognitive, emotional, and social transitions that shape future adjustment and life outcomes. Recent evidence suggests that adolescents worldwide are experiencing increasing levels of psychological distress, emotional difficulties, and academic pressures, highlighting the need to identify factors that may either enhance or undermine well-being during this critical developmental stage (Magomedova & Fatima, 2025). Understanding the mechanisms that contribute to psychological well-being among high school students has therefore become a major priority for researchers, educators, and policymakers.

One of the most significant changes affecting adolescent development in recent years has been the rapid expansion of digital technologies and social media platforms. Social media applications have become deeply integrated into the daily lives of adolescents, providing opportunities for communication, entertainment, self-expression, and information exchange. Although these technologies offer numerous benefits, growing concerns have emerged regarding excessive and problematic patterns of use. Researchers have increasingly conceptualized problematic engagement with social networking platforms as social media addiction, a behavioral phenomenon characterized by excessive preoccupation, impaired self-regulation, compulsive use, withdrawal symptoms, and negative consequences in daily functioning (He & Chen, 2024; Luo et al., 2022). The prevalence of problematic digital technology use has increased substantially across educational settings, with studies reporting alarming levels of smartphone addiction, internet addiction, and social media dependency among students and young adults (Seema et al., 2024; Tasijawa et al., 2024; Zhong et al., 2022). Meta-analytic findings further suggest that mobile phone addiction has become a widespread public health concern among young populations, with implications for both psychological and educational outcomes (Yu et al., 2025).

Theoretical perspectives on behavioral addiction suggest that social media platforms are designed to maximize user engagement through continuous reinforcement mechanisms, social validation cues, personalized content delivery, and opportunities for immediate gratification. These characteristics can contribute to compulsive patterns of use, especially among adolescents whose self-regulatory capacities are still developing. A systematic review of social networking sites identified techno-social stress as a significant consequence of excessive social media engagement, emphasizing how constant connectivity and digital demands may create psychological strain and emotional exhaustion (Naga & Ebarido, 2025). Similarly, research has demonstrated that problematic social media use is associated with increased anxiety, depression, emotional dysregulation, and various indicators of poor mental health (David et al., 2024; Jiang, 2021; Si et al., 2023). Contemporary network analyses have also shown that social media addiction is closely interconnected with broader mental health difficulties, suggesting that it may function as both a cause and consequence of psychological maladjustment (Feng et al., 2025).

The relationship between social media addiction and psychological well-being has received increasing empirical attention. Excessive engagement with social media may reduce opportunities for face-to-face social interaction, increase social comparison processes, expose adolescents to cyberbullying and unrealistic standards, and contribute to emotional exhaustion. These experiences can undermine self-esteem, life satisfaction, and overall well-being. Studies investigating problematic TikTok use and other forms of social media addiction have reported significant associations with depressive symptoms, emotional distress, and reduced psychological functioning among young adults and students (David et al., 2024; Rogowska & Lechowicz, 2025). Research focusing on adolescents has similarly demonstrated that problematic internet and social media use is associated with poorer quality of life and lower psychological adjustment (Feher et al., 2023). These findings suggest that social media addiction may represent an important risk factor for diminished psychological well-being among adolescents.

An additional pathway through which social media addiction may affect adolescent functioning is sleep quality. Sleep is a fundamental biological process that supports cognitive performance, emotional regulation, physical health, and psychological well-being. During adolescence, adequate sleep is particularly important because it

contributes to learning, memory consolidation, academic functioning, and emotional resilience. However, contemporary adolescents frequently experience insufficient sleep duration and poor sleep quality, often due to increased digital media use. A growing body of literature has demonstrated that excessive engagement with social media is associated with delayed bedtimes, sleep disturbances, reduced sleep duration, and insomnia symptoms (Liu, 2023; Yu et al., 2024). A comprehensive scoping review examining youth populations concluded that social media use consistently predicts poorer sleep outcomes and adverse mental health consequences (Yu et al., 2024).

Several mechanisms may explain the relationship between social media addiction and sleep disturbances. First, extended screen exposure may delay sleep onset through displacement of sleep time. Second, blue light emitted from electronic devices can interfere with circadian rhythms and melatonin secretion. Third, emotional arousal generated by online interactions may increase cognitive activation and make it more difficult to initiate sleep. Fourth, fear of missing out and compulsive checking behaviors may lead adolescents to remain engaged with social media late into the night. Empirical findings support these mechanisms, demonstrating significant relationships between social media addiction, fear of missing out, social media fatigue, and poor sleep quality (Zhu et al., 2023). Research investigating problematic TikTok use has further identified insomnia as a key mediator linking social media addiction with depressive symptoms (Rogowska & Lechowicz, 2025). These findings suggest that sleep quality may represent a critical mechanism through which social media addiction influences adolescent psychological outcomes.

In addition to its association with psychological well-being, sleep quality has important implications for academic functioning. Academic burnout has emerged as a significant educational concern among adolescents and students worldwide. Academic burnout is generally characterized by emotional exhaustion related to academic demands, cynical attitudes toward school activities, and feelings of reduced academic efficacy. Recent reviews indicate that academic burnout is influenced by a wide range of personal, academic, technological, and environmental factors and is increasingly prevalent across different student populations (Chong et al., 2025). Academic burnout is associated with decreased motivation, poorer academic performance, emotional difficulties, and reduced quality of life, making it a critical issue within educational psychology.

Research increasingly suggests that problematic technology use contributes significantly to academic burnout. Students who spend excessive time engaging with digital technologies may experience attentional difficulties, reduced academic engagement, disrupted study habits, and increased emotional exhaustion. Studies examining mobile phone addiction have consistently reported positive associations with academic burnout among students (Cao et al., 2024; Song et al., 2025). Longitudinal evidence has demonstrated reciprocal relationships between problematic Facebook use and academic burnout, suggesting that these phenomena may reinforce one another over time (Tomaszek & Muchacka-Cymerman, 2021, 2022). Similarly, investigations of learning burnout have identified fear of missing out and social media-related behaviors as important contributors to student exhaustion and disengagement (S. Ye et al., 2023). Research conducted among Chinese college students further demonstrated that social media addiction and academic burnout are closely linked within broader mental health networks (Feng et al., 2025).

Sleep quality may also play an important role in the development of academic burnout. Students who experience insufficient or poor-quality sleep often report difficulties with concentration, emotional regulation, motivation, and academic engagement. These impairments can contribute directly to feelings of exhaustion and academic inefficacy. Empirical studies have consistently documented significant associations between poor sleep quality and elevated burnout symptoms among students. For example, research involving primary school students found that learning burnout significantly predicted poorer sleep quality and mental health outcomes (Qin et al., 2022). Longitudinal studies of adolescents have similarly demonstrated that sleep difficulties contribute to increases in school burnout over time (Vazsonyi et al., 2024). Additional evidence indicates that active social media use, bedtime behaviors, and emotional exhaustion are dynamically interconnected throughout adolescence (Maksniemi et al., 2022). Moreover, digital burnout has been shown to be strongly associated with poor sleep quality among university students (Al-Muslim et al., 2025).

The growing literature on digital addiction suggests that various forms of problematic online behavior may contribute simultaneously to sleep difficulties, burnout, and impaired well-being. Studies involving internet addiction have documented associations with burnout, insomnia, depression, and lower quality of life across diverse populations, including students, teachers, and recreational

esports players (Feher et al., 2025; Pohl et al., 2021). Research examining short-form video addiction among adolescents has further demonstrated that excessive engagement with digital content may produce significant psychological and behavioral consequences through stress-coping processes (Mu et al., 2022). These findings collectively suggest that digital addiction-related behaviors may exert broad effects across multiple domains of adolescent functioning.

Psychological well-being may be particularly vulnerable to the combined effects of social media addiction, poor sleep quality, and academic burnout. Adolescents experiencing high levels of digital dependency may encounter disrupted sleep patterns that undermine emotional regulation and cognitive functioning. These difficulties may subsequently contribute to academic burnout, which in turn diminishes psychological well-being. Existing evidence supports each of these individual associations. Social media addiction has been linked to poorer mental health outcomes (David et al., 2024; Si et al., 2023), poor sleep quality has been associated with reduced psychological functioning (Yu et al., 2024), and academic burnout has been identified as a significant predictor of emotional distress and reduced well-being (Chong et al., 2025; X. Ye et al., 2023). Broader adolescent research examining campus climate and mental health also emphasizes the importance of psychosocial stressors in shaping well-being outcomes (Samek et al., 2023).

Despite substantial research examining these variables independently, relatively few studies have investigated them simultaneously within an integrated structural framework among high school students. Much of the existing literature has focused on university populations, specific digital platforms, or isolated relationships between pairs of variables. Consequently, less is known about how social media addiction may influence psychological well-being directly and indirectly through sleep quality and academic burnout during adolescence. Examining these relationships within a single structural model may provide a more comprehensive understanding of the mechanisms linking digital behavior to psychological adjustment and academic functioning. Such knowledge is essential for designing evidence-based interventions that target not only problematic social media use but also the sleep and academic processes through which its effects may occur.

Therefore, the aim of the present study was to test a structural model examining the direct and indirect relationships among social media addiction, sleep quality,

academic burnout, and psychological well-being among Canadian high school students.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a cross-sectional correlational design using Structural Equation Modeling (SEM) to examine the direct and indirect relationships among social media addiction, sleep quality, academic burnout, and psychological well-being among high school students. The study was conducted during the 2025–2026 academic year in public high schools across the province of Ontario, Canada. The target population consisted of students enrolled in grades 9 through 12 who were between 14 and 18 years of age. A multistage cluster sampling procedure was utilized to ensure adequate representation of students from urban and suburban educational settings. Initially, several school districts were randomly selected from different regions of Ontario. Subsequently, schools were chosen from each district, and classes within selected schools were randomly sampled. Students who provided informed consent, along with parental consent for minors, were invited to participate in the study.

A total of 742 students participated in the research. After screening for incomplete questionnaires, response inconsistencies, and multivariate outliers, 718 questionnaires were retained for final analysis. Inclusion criteria consisted of enrollment in a Canadian high school, regular attendance during the study period, and active use of at least one social media platform. Students with diagnosed severe cognitive impairments that could interfere with questionnaire completion were excluded from participation.

2.2. Measures

Social media addiction was assessed using the Bergen Social Media Addiction Scale (BSMAS), developed by Andreassen et al. in 2016. The scale consists of six items designed to measure core addiction components associated with social media use, including salience, mood modification, tolerance, withdrawal, conflict, and relapse. Participants responded to each item using a five-point Likert scale ranging from 1 (very rarely) to 5 (very often). Total scores range from 6 to 30, with higher scores indicating greater levels of problematic social media use and addiction-related behaviors. Previous studies conducted across adolescent populations have reported satisfactory

psychometric properties for the BSMAS, including strong internal consistency, convergent validity, and construct validity. Reliability coefficients reported in previous research generally exceed 0.80, supporting its suitability for use among adolescent populations.

Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI), developed by Buysse et al. in 1989. The PSQI is a widely used self-report instrument consisting of 19 items that assess sleep quality and disturbances over the previous month. The instrument yields seven component scores, including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. These components are combined to generate a global score ranging from 0 to 21, with higher scores reflecting poorer sleep quality. The PSQI has been extensively validated across adolescent and adult populations and has demonstrated acceptable levels of reliability and validity in educational and psychological research settings. Previous studies have reported Cronbach's alpha coefficients ranging from 0.70 to 0.85, indicating satisfactory internal consistency.

Academic burnout was evaluated using the Maslach Burnout Inventory–Student Survey (MBI-SS), developed by Schaufeli et al. in 2002. This instrument contains 15 items distributed across three dimensions: emotional exhaustion, cynicism toward school-related activities, and academic efficacy. Participants rated each item on a seven-point Likert scale ranging from 0 (never) to 6 (always). Higher scores on emotional exhaustion and cynicism, combined with lower academic efficacy, indicate greater levels of academic burnout. The MBI-SS has been widely utilized in studies involving secondary school and university students and has demonstrated strong factorial validity and reliability. Previous investigations have reported Cronbach's alpha values exceeding 0.80 for the overall scale and its subscales, supporting its appropriateness for assessing burnout symptoms among adolescents.

Psychological well-being was measured using the Psychological Well-Being Scale developed by Ryff in 1989. The 42-item version of the instrument was employed in the present study. This scale assesses six dimensions of psychological well-being, including autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Responses are recorded on a six-point Likert scale ranging from strongly disagree to strongly agree. Higher scores indicate greater levels of psychological well-being and positive psychological functioning. The Ryff Psychological Well-

Being Scale has been extensively used in psychological and educational research and has demonstrated strong psychometric properties across different cultural contexts and age groups. Previous studies have reported acceptable levels of internal consistency, construct validity, and test-retest reliability, confirming its suitability for adolescent populations.

2.3. Data Analysis

Data analysis was conducted using IBM SPSS Statistics version 29 and AMOS version 29. Initially, descriptive statistics, including means, standard deviations, skewness, and kurtosis values, were calculated for all study variables. Prior to hypothesis testing, data were screened for missing values, normality, multicollinearity, and outliers. Pearson correlation coefficients were computed to examine bivariate relationships among social media addiction, sleep quality, academic burnout, and psychological well-being.

The proposed conceptual model was evaluated using Structural Equation Modeling (SEM). Confirmatory Factor Analysis (CFA) was first performed to assess the adequacy of the measurement model and to verify the latent structure of the study constructs. Following confirmation of acceptable measurement properties, the structural model was tested to evaluate direct and indirect pathways among the variables. Maximum likelihood estimation was employed to estimate model parameters. Model fit was assessed using multiple goodness-of-fit indices, including the chi-square statistic divided by degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Goodness-of-Fit Index (GFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). Values of CFI, TLI, and GFI greater than 0.90, SRMR values below 0.08, and RMSEA values below 0.08 were considered indicative of acceptable model fit.

To examine mediating effects, bootstrapping procedures with 5,000 resamples were conducted to estimate indirect effects and their corresponding 95% confidence intervals. Indirect effects were considered statistically significant when confidence intervals did not include zero. Statistical significance for all analyses was established at $p < .05$. The final structural model was interpreted based on standardized path coefficients, explained variance (R^2), and overall model fit indicators to determine the extent to which social media addiction and sleep quality contributed to academic burnout and psychological well-being among Canadian high school students.

3. Findings and Results

A total of 718 high school students from Ontario, Canada were included in the final analysis. The participants ranged in age from 14 to 18 years, with a mean age of 16.12 years (SD = 1.21). Among the participants, 372 students (51.8%) were female and 346 (48.2%) were male. Regarding grade level, 24.8% were enrolled in Grade 9, 25.6% in Grade 10, 24.5% in Grade 11, and 25.1% in Grade 12. The average reported daily social media use was 4.73 hours (SD = 1.94).

Approximately 67.4% of participants reported using social media for more than four hours per day. Preliminary screening indicated that missing data were below 2% for all variables and were handled using expectation-maximization procedures. Examination of skewness and kurtosis values demonstrated acceptable univariate normality, with all values falling within recommended thresholds of ± 2 . Multivariate assumptions required for Structural Equation Modeling were also satisfied.

Table 1

Descriptive Statistics and Correlations among Study Variables (N = 718)

Variable	Mean	SD	1	2	3	4
1. Social Media Addiction	18.94	5.42	—			
2. Sleep Quality (PSQI)	8.27	3.18	.52**	—		
3. Academic Burnout	43.86	10.77	.58**	.49**	—	
4. Psychological Well-Being	171.43	24.51	-.55**	-.47**	-.62**	—

Table 1 presents the descriptive statistics and bivariate correlations among the primary study variables. The findings revealed moderate to strong associations among all constructs. Social media addiction demonstrated a significant positive relationship with poor sleep quality ($r = .52, p < .01$) and academic burnout ($r = .58, p < .01$), indicating that higher levels of problematic social media use were associated with poorer sleep patterns and greater burnout symptoms. Social media addiction was also negatively associated with psychological well-being ($r = -.55, p < .01$), suggesting that excessive engagement with

social media may be linked to reduced psychological functioning. Poor sleep quality showed a moderate positive correlation with academic burnout ($r = .49, p < .01$) and a negative correlation with psychological well-being ($r = -.47, p < .01$). The strongest association was observed between academic burnout and psychological well-being ($r = -.62, p < .01$), indicating that students experiencing elevated burnout tended to report substantially lower levels of psychological well-being. Overall, the correlation matrix provided preliminary support for the hypothesized structural relationships among the study variables.

Table 2

Measurement Model Fit Indices Obtained from Confirmatory Factor Analysis

Fit Index	Obtained Value	Recommended Value
χ^2	823.47	—
df	389	—
χ^2/df	2.12	< 3.00
CFI	.957	> .90
TLI	.951	> .90
GFI	.924	> .90
AGFI	.911	> .90
RMSEA	.039	< .08
SRMR	.041	< .08

The measurement model was first evaluated using Confirmatory Factor Analysis to determine whether the observed indicators adequately represented their respective latent constructs. As shown in Table 2, all goodness-of-fit indices indicated excellent model fit. The chi-square to degrees-of-freedom ratio was 2.12, which was well below

the recommended threshold of 3.00. Comparative Fit Index (CFI = .957), Tucker-Lewis Index (TLI = .951), Goodness-of-Fit Index (GFI = .924), and Adjusted Goodness-of-Fit Index (AGFI = .911) all exceeded recommended criteria, demonstrating strong correspondence between the theoretical measurement model and the observed data.

Furthermore, the RMSEA value of .039 and SRMR value of .041 suggested very good approximation of the model to the sample covariance matrix. All factor loadings were statistically significant ($p < .001$) and ranged from .63 to .88,

supporting convergent validity of the latent variables. These findings confirmed that the measurement model was suitable for subsequent structural analyses.

Figure 1

Structural Model of Social Media Addiction, Sleep Quality, Academic Burnout, and Psychological Well-Being among High School Students

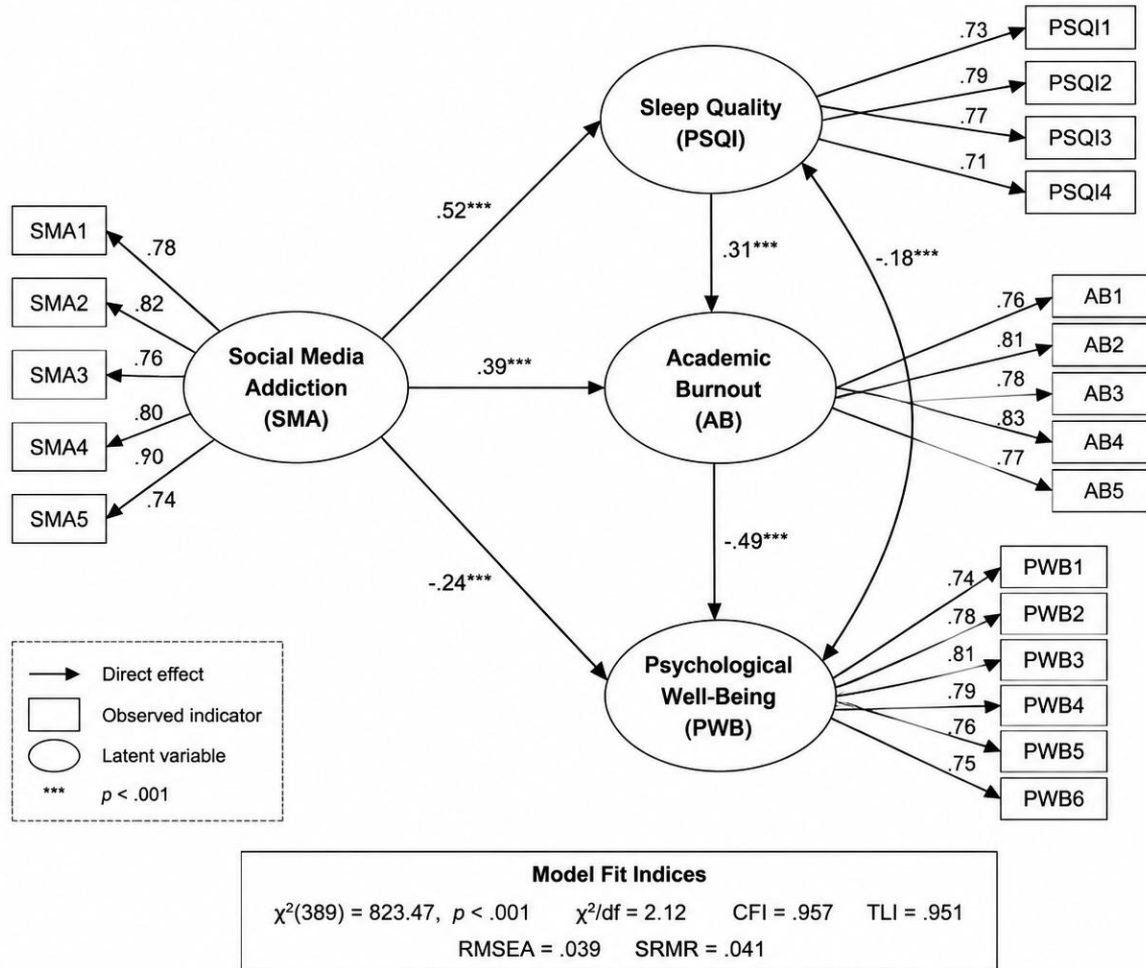


Figure 1. Structural Model of Social Media Addiction, Sleep Quality, Academic Burnout, and Psychological Well-Being among High School Students.

The hypothesized structural model was subsequently estimated using maximum likelihood procedures. Examination of the standardized path coefficients indicated that all major pathways were statistically significant and in the expected directions. Social media addiction emerged as a significant predictor of both sleep quality deterioration and academic burnout, while simultaneously exerting a direct negative effect on psychological well-being. Sleep quality also contributed significantly to academic burnout and

psychological well-being. The overall pattern of relationships suggested that sleep quality functioned as an important intermediary mechanism through which excessive social media engagement affected students' academic and psychological outcomes. The structural model explained substantial proportions of variance in the endogenous constructs, demonstrating the practical significance of the proposed framework.

Table 3

Standardized Direct Effects in the Structural Model

Structural Path	β	SE	CR	p
Social Media Addiction → Sleep Quality	.52	.04	11.83	< .001
Social Media Addiction → Academic Burnout	.39	.05	8.62	< .001
Social Media Addiction → Psychological Well-Being	-.24	.05	-5.14	< .001
Sleep Quality → Academic Burnout	.31	.04	7.23	< .001
Sleep Quality → Psychological Well-Being	-.18	.04	-4.42	< .001
Academic Burnout → Psychological Well-Being	-.49	.05	-10.57	< .001

The direct effects presented in Table 3 demonstrated that social media addiction significantly increased poor sleep quality ($\beta = .52, p < .001$) and academic burnout ($\beta = .39, p < .001$). In addition, social media addiction directly reduced psychological well-being ($\beta = -.24, p < .001$). Sleep quality was also a significant predictor of academic burnout ($\beta = .31, p < .001$), indicating that students experiencing greater sleep disturbances reported higher levels of burnout. Moreover, poor sleep quality was associated with lower psychological

well-being ($\beta = -.18, p < .001$). Academic burnout emerged as the strongest direct predictor of psychological well-being ($\beta = -.49, p < .001$), suggesting that burnout symptoms exerted a substantial detrimental influence on students' psychological functioning. Collectively, these findings supported all hypothesized direct relationships and highlighted the central role of academic burnout within the proposed model.

Table 4

Bootstrapped Indirect Effects and Mediation Analysis

Indirect Path	β	95% CI Lower	95% CI Upper	p
Social Media Addiction → Sleep Quality → Academic Burnout	.16	.11	.22	< .001
Social Media Addiction → Academic Burnout → Psychological Well-Being	-.19	-.25	-.14	< .001
Social Media Addiction → Sleep Quality → Psychological Well-Being	-.09	-.14	-.05	< .001
Social Media Addiction → Sleep Quality → Academic Burnout → Psychological Well-Being	-.08	-.12	-.04	< .001

Bootstrapping analyses based on 5,000 resamples were conducted to evaluate indirect effects within the structural model. As shown in Table 4, all indirect pathways were statistically significant because their confidence intervals did not include zero. Social media addiction indirectly increased academic burnout through deteriorated sleep quality ($\beta = .16, p < .001$), indicating that sleep problems partially explained the relationship between excessive social media use and burnout symptoms. Furthermore, social media addiction exerted a significant indirect negative effect on psychological well-being through academic burnout ($\beta = -.19, p < .001$), suggesting that burnout constituted an important mechanism linking problematic social media use to poorer psychological functioning. Sleep quality also mediated the relationship between social media addiction and psychological well-being ($\beta = -.09, p < .001$). The serial mediation pathway involving sleep quality and academic burnout simultaneously was likewise significant ($\beta = -.08, p < .001$). These findings demonstrate that the negative consequences of social media addiction on adolescents'

psychological well-being operate not only through direct effects but also through a sequence of sleep-related and academic stress processes. The final model accounted for 27% of the variance in sleep quality, 46% of the variance in academic burnout, and 58% of the variance in psychological well-being, indicating substantial explanatory power and strong support for the proposed theoretical framework.

4. Discussion

The present study tested a structural model of social media addiction, sleep quality, academic burnout, and psychological well-being among Canadian high school students. Overall, the findings supported the proposed model and demonstrated that social media addiction was significantly associated with poorer sleep quality, higher academic burnout, and lower psychological well-being. The results also showed that sleep quality and academic burnout played important explanatory roles in the relationship between social media addiction and psychological well-being. In the final model, social media addiction directly

predicted poor sleep quality, academic burnout, and psychological well-being, while sleep quality also predicted academic burnout and psychological well-being. Academic burnout emerged as the strongest direct predictor of psychological well-being. In addition, the mediation analyses indicated that social media addiction indirectly affected psychological well-being through sleep quality, through academic burnout, and through the serial pathway of sleep quality and academic burnout. These findings suggest that problematic social media use among high school students should not be understood as an isolated behavioral issue, but rather as part of a broader psychosocial process that affects sleep regulation, academic functioning, and mental well-being.

The significant positive relationship between social media addiction and poor sleep quality is consistent with previous evidence showing that excessive social media and digital technology use can interfere with healthy sleep patterns. In the present study, social media addiction was one of the strongest predictors of sleep quality, indicating that students with higher levels of addictive social media use were more likely to report sleep difficulties. This finding aligns with research showing that social media use among youth is associated with sleep disturbances, delayed sleep timing, shorter sleep duration, and poorer mental health outcomes (Yu et al., 2024). It is also consistent with studies reporting that adolescent social media use negatively affects sleeping duration and sleep quality (Liu, 2023). One possible explanation is that addictive use of social media increases bedtime procrastination, emotional arousal, compulsive checking, and fear of missing out, all of which can delay sleep onset and reduce sleep efficiency. The present result is also supported by research on social media fatigue, fear of missing out, and sleep quality, which has demonstrated that problematic social media engagement is closely associated with poorer sleep outcomes (Zhu et al., 2023). Similarly, findings on problematic TikTok use suggest that insomnia may function as a mechanism through which platform-specific addiction contributes to psychological symptoms (Rogowska & Lechowicz, 2025).

The finding that social media addiction significantly predicted academic burnout is also consistent with prior studies. In the current model, higher social media addiction was associated with greater academic burnout, suggesting that students who showed more compulsive and poorly regulated engagement with social media were more likely to experience exhaustion, cynicism toward schoolwork, and reduced academic efficacy. This result corresponds with

studies demonstrating that mobile phone addiction is significantly related to academic burnout among students (Cao et al., 2024; Song et al., 2025). It also supports network-based evidence showing close interconnections between social media addiction and academic burnout in student populations (Feng et al., 2025). Excessive social media use may contribute to burnout by displacing study time, fragmenting attention, increasing procrastination, weakening self-regulation, and creating continuous cognitive-emotional stimulation. These mechanisms may reduce students' capacity to engage effectively with academic tasks and increase their sense of pressure and exhaustion. The finding is further compatible with longitudinal work indicating that problematic Facebook use and academic burnout may reinforce each other over time (Tomaszek & Muchacka-Cymerman, 2021, 2022). Therefore, the present study extends existing findings by showing that this association is also evident in a structural model among high school students.

The direct negative effect of social media addiction on psychological well-being indicates that problematic social media use may impair adolescents' broader psychological functioning even after considering sleep quality and academic burnout. This result is in line with studies showing associations between social media addiction, mental disorders, depressive symptoms, anxiety, and reduced quality of life (David et al., 2024; Feher et al., 2023). Social media addiction may reduce psychological well-being through several mechanisms. First, compulsive use may weaken adolescents' sense of control over their behavior, reducing self-efficacy and autonomy. Second, excessive exposure to idealized images and social comparison may undermine self-acceptance and emotional security. Third, persistent online engagement may reduce opportunities for restorative offline activities, face-to-face relationships, and academic mastery experiences. Fourth, problematic use may increase vulnerability to digital stress, including constant availability, social pressure, and information overload. This interpretation is consistent with the conceptualization of social networking sites as sources of techno-social stress (Naga & Ebarido, 2025). It also aligns with broader evidence indicating that digital addiction symptoms among school-aged populations represent an emerging psychological and educational concern (Seema et al., 2024; Tasijawa et al., 2024).

Another important finding was that poor sleep quality significantly predicted academic burnout. Students who reported poorer sleep quality were more likely to experience

higher academic burnout. This finding supports previous evidence showing that sleep difficulties are closely related to school burnout and academic exhaustion. Developmental research has emphasized the importance of sleep in changes in school burnout across adolescence, suggesting that insufficient or poor-quality sleep may increase students' vulnerability to burnout symptoms (Vazsonyi et al., 2024). Similarly, research on learning burnout and sleep quality among school students has shown that burnout and sleep are closely connected through mental health mechanisms (Qin et al., 2022). In the present study, sleep quality appears to represent a key bridge between digital behavior and academic functioning. Poor sleep may reduce attention, working memory, emotional regulation, and academic persistence, thereby increasing the likelihood that students experience school demands as exhausting and overwhelming. This interpretation is also consistent with longitudinal findings showing intraindividual links between active social media use, exhaustion, and bedtime across adolescence (Maksniemi et al., 2022).

The finding that poor sleep quality predicted lower psychological well-being is also theoretically and empirically meaningful. Sleep is essential for emotional regulation, cognitive restoration, stress recovery, and psychological resilience. When students experience chronic sleep disturbance, they may become more emotionally reactive, less motivated, and less capable of managing academic and interpersonal stressors. The present finding aligns with studies showing that digital burnout and sleep quality are significantly associated in student populations (Al-Muslim et al., 2025). It is also consistent with research linking problematic internet use to insomnia, depression, burnout, and lower quality of life (Feher et al., 2025). These results suggest that sleep quality should be considered a central component of adolescent psychological well-being. In practical terms, interventions targeting social media addiction may be more effective when they also address sleep hygiene, bedtime routines, and nighttime technology use.

Academic burnout was the strongest direct predictor of psychological well-being in the final structural model. This finding indicates that academic burnout may be one of the most immediate psychological pathways through which digital and sleep-related difficulties influence adolescent adjustment. Students who experience academic exhaustion, detachment from schoolwork, and reduced academic efficacy may also experience lower self-acceptance, lower purpose in life, poorer environmental mastery, and weaker

positive functioning. This result is consistent with broad reviews identifying student burnout as a multidimensional problem with significant implications for emotional health, academic performance, and general functioning (Chong et al., 2025). It also corresponds with evidence showing that academic burnout is associated with mental health difficulties among adolescents and students (S. Ye et al., 2023; X. Ye et al., 2023). The finding is especially important because high school students face developmental and academic pressures related to identity formation, peer relationships, grades, university preparation, and future career expectations. When these pressures combine with poor sleep and compulsive social media use, students may become increasingly vulnerable to psychological distress.

The significant indirect effects provide further support for the proposed structural model. Social media addiction indirectly increased academic burnout through poor sleep quality, suggesting that one reason addicted social media users experience greater academic burnout is that their sleep becomes disrupted. This result is consistent with evidence that problematic digital use is associated with both sleep disturbance and burnout (Feher et al., 2023; Pohl et al., 2021). Social media addiction also indirectly reduced psychological well-being through academic burnout, indicating that burnout is a major mechanism linking problematic digital engagement to poorer psychological functioning. This finding is consistent with studies showing that problematic social media or internet use is related to academic and emotional maladjustment (Feng et al., 2025; Jiang, 2021). The serial mediation pathway was also significant, showing that social media addiction may first impair sleep quality, which then increases academic burnout, which subsequently reduces psychological well-being. This sequential pattern is important because it clarifies how behavioral, physiological, academic, and psychological domains may become connected in adolescent life.

The results also contribute to the growing literature on digital addiction beyond a single platform or population. Previous studies have examined smartphone addiction, short-form video addiction, TikTok use, Facebook intrusion, internet addiction, and mobile phone addiction across diverse student groups (Mu et al., 2022; Sl et al., 2023; Yu et al., 2025; Zhong et al., 2022). The present findings integrate these related lines of evidence by showing that problematic social media use among high school students is structurally connected to sleep quality, academic burnout, and psychological well-being. This integrated perspective is important because adolescents rarely experience digital

problems in isolation. Rather, compulsive digital use may interact with academic stress, sleep disturbance, emotional difficulties, and broader developmental challenges. The results are also consistent with research emphasizing that well-being in the modern era is shaped by multiple interacting psychological, social, technological, and educational pressures (Magomedova & Fatima, 2025). Furthermore, evidence on campus climate and adolescent mental health highlights the importance of contextual and psychosocial stressors in shaping students' adjustment (Samek et al., 2023). Although the current study focused on high school students rather than university students, the findings suggest that school environments should pay close attention to digital habits as part of broader mental health promotion.

5. Conclusion

Overall, the findings support the view that social media addiction is a significant risk factor for poor sleep quality, academic burnout, and reduced psychological well-being among high school students. The results also show that sleep quality and academic burnout are not merely outcomes of problematic social media use, but important mechanisms through which its negative psychological effects may unfold. This pattern is consistent with studies on digital teaching, academic burnout, and post-pandemic student challenges, which suggest that technology-related academic experiences can influence student exhaustion and engagement (Song et al., 2022). The present model therefore provides a useful framework for understanding adolescent well-being in digitally saturated educational contexts. Rather than treating social media addiction, sleep disturbance, academic burnout, and psychological well-being as separate concerns, the findings suggest that these constructs should be addressed as interconnected domains within school-based prevention and intervention programs.

6. Limitations & Suggestions

The present study has several limitations. First, the cross-sectional design prevents causal conclusions about the direction of relationships among social media addiction, sleep quality, academic burnout, and psychological well-being. Although the proposed structural model was theoretically grounded and statistically supported, longitudinal and experimental studies are needed to confirm temporal ordering. Second, the data were collected through self-report questionnaires, which may be influenced by

social desirability, recall bias, or response style. Third, the sample was limited to high school students in Ontario, Canada, which may restrict the generalizability of the findings to students in other provinces, countries, educational systems, or cultural contexts. Fourth, although the study included major psychological and academic variables, it did not examine potentially important contextual factors such as family functioning, parental monitoring, school climate, peer support, socioeconomic status, or specific platform use patterns. Fifth, the study assessed social media addiction broadly and did not distinguish between different platforms, types of use, content exposure, or active versus passive engagement.

Future research should examine the proposed model using longitudinal designs to clarify whether social media addiction precedes sleep disturbance and academic burnout or whether these relationships are reciprocal over time. Studies should also test the model across different age groups, cultural contexts, and educational systems to determine whether the structural pathways remain stable across populations. Future investigations may benefit from using mixed-method designs that combine self-report scales with objective indicators such as screen-time records, sleep tracking, academic records, and ecological momentary assessment. Researchers should also examine whether gender, age, socioeconomic status, parental mediation, peer relationships, school connectedness, and type of social media platform moderate the relationships identified in this study. In addition, future studies should explore protective factors such as self-regulation, mindfulness, physical activity, digital literacy, resilience, and family support to determine which factors buffer students against the negative effects of problematic social media use.

The findings have important implications for educational and psychological practice. Schools should develop integrated prevention programs that address social media habits, sleep hygiene, academic stress management, and psychological well-being together rather than separately. Counselors, teachers, and school psychologists should screen for problematic social media use when students present with sleep difficulties, exhaustion, academic disengagement, or reduced well-being. Psychoeducational programs can teach students how to regulate social media use, reduce nighttime screen exposure, manage fear of missing out, and build healthier bedtime routines. Academic burnout prevention should also be incorporated into school mental health services through workload management, study skills training, emotional regulation strategies, and

supportive teacher-student relationships. Parents should be included in intervention efforts so that home routines, device boundaries, and sleep-supportive environments reinforce school-based recommendations. Overall, promoting adolescent well-being in the digital age requires coordinated efforts that recognize the interaction between technology use, sleep, academic functioning, and mental health.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

References

- Al-Muslim, M., Alghafli, G. A., Alghafli, I. A., Alyousef, S., Aldossary, G., Alsaigh, B., Mousa, O., & Al-Sayedahmed, H. (2025). Association Between Digital Burnout and Sleep Quality Among King Faisal University Students. <https://doi.org/10.21203/rs.3.rs-6105207/v1>
- Cao, X.-X., Fu, Y., Wang, N.-D., & Lian, S.-L. (2024). Mobile Phone Addiction and Academic Burnout: The Mediating Role of Technology Conflict and the Protective Role of Mindfulness. *Frontiers in Psychiatry*, 15. <https://doi.org/10.3389/fpsy.2024.1365914>
- Chong, L. Z., Foo, L. K., & Chua, S.-L. (2025). Student Burnout: A Review on Factors Contributing to Burnout Across Different Student Populations. *Behavioral Sciences*, 15(2), 170. <https://doi.org/10.3390/bs15020170>
- David, L., Ismaiel, A., Foucambert, P., Leucuța, D.-C., Popa, S. L., Stănculete, M. F., & Dumitrașcu, D. L. (2024). Mental Disorders, Social Media Addiction, and Academic Performance in Romanian Undergraduate Nursing Students. *Journal of clinical medicine*, 13(15), 4475. <https://doi.org/10.3390/jcm13154475>
- Feher, A., Fejes, É., Fehér, G., Horváth, L., & Tibold, A. (2025). Association of Problematic Usage of the Internet With Burnout, Depression, Insomnia and Quality of Life Among Hungarian Recreational Esports Players: A Cross Sectional Study. *Frontiers in Public Health*, 13. <https://doi.org/10.3389/fpubh.2025.1619810>
- Feher, A., Fejes, É., Kapus, K., Jancsák, C., Nagy, G. D., Horváth, L., Tibold, A., & Fehér, G. (2023). The Association of Problematic Usage of the Internet With Burnout, Depression, Insomnia, and Quality of Life Among Hungarian High School Students. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1167308>
- Feng, T., Wang, B., Mi, M., Ren, L., Wu, L., Wang, H., Liu, X., & Wang, X. (2025). The Relationships Between Mental Health and Social Media Addiction, and Between Academic Burnout and Social Media Addiction Among Chinese College Students: A Network Analysis. *Heliyon*, 11(3), e41869. <https://doi.org/10.1016/j.heliyon.2025.e41869>
- He, S., & Chen, I. H. (2024). Internet Addiction Among Teachers: A Systematic Review. *Environment and Social Psychology*, 9(6). <https://doi.org/10.54517/esp.v9i6.2513>
- Jiang, Y. (2021). Problematic Social Media Usage and Anxiety Among University Students During the COVID-19 Pandemic: The Mediating Role of Psychological Capital and the Moderating Role of Academic Burnout. *Frontiers in psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.612007>
- Liu, R. (2023). The Influence of Social Media on Adolescent Sleeping Duration and Quality. *SHS Web of Conferences*, 180, 02016. <https://doi.org/10.1051/shsconf/202318002016>
- Luo, A., Kong, W., He, H., Li, Y., & Xie, W. (2022). Status and Influencing Factors of Social Media Addiction in Chinese Medical Care Professionals: A Cross-Sectional Survey. *Frontiers in psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.888714>
- Magomedova, A., & Fatima, G. (2025). Mental Health and Well-Being in the Modern Era: A Comprehensive Review of Challenges and Interventions. *Cureus*. <https://doi.org/10.7759/cureus.77683>
- Maksniemi, E., Hietajärvi, L., Ketonen, E., Lonka, K., Puukko, K., & Salmela-Aro, K. (2022). Intraindividual Associations Between Active Social Media Use, Exhaustion, and Bedtime Vary According to Age—A Longitudinal Study Across Adolescence. *Journal of adolescence*, 94(3), 401-414. <https://doi.org/10.1002/jad.12033>
- Mu, H.-L., Jiang, Q., Xu, J., & Chen, S. (2022). Drivers and Consequences of Short-Form Video (SFV) Addiction Amongst Adolescents in China: Stress-Coping Theory Perspective. *International journal of environmental research and public health*, 19(21), 14173. <https://doi.org/10.3390/ijerph192114173>
- Naga, J. F., & Ebarido, R. (2025). Social Network Sites (SNS) an Archetype of Techno-Social Stress: A Systematic Review. *Heliyon*, 11(1), e41119. <https://doi.org/10.1016/j.heliyon.2024.e41119>
- Pohl, M., Fehér, G., Kapus, K., Feher, A., Nagy, G. D., Kiss, J., Fejes, É., Horváth, L., & Tibold, A. (2021). The Association of Internet Addiction With Burnout, Depression, Insomnia, and Quality of Life Among Hungarian High School Teachers. *International journal of environmental research and public health*, 19(1), 438. <https://doi.org/10.3390/ijerph19010438>

- Qin, L., Chen, S., Luo, B.-A., & Chen, Y.-W. (2022). The Effect of Learning Burnout on Sleep Quality in Primary School Students: The Mediating Role of Mental Health. *Healthcare*, *10*(10), 2076. <https://doi.org/10.3390/healthcare10102076>
- Rogowska, A. M., & Lechowicz, O. (2025). The Relationship Between Problematic TikTok Use and Depression in University Students: The Mediating Role of Insomnia. *Journal of clinical medicine*, *14*(13), 4652. <https://doi.org/10.3390/jcm14134652>
- Samek, D. R., Crumly, B., Akua, B. A., Dawson, M., & Duke-Marks, A. (2023). Microaggressions, Perceptions of Campus Climate, Mental Health, and Alcohol Use Among First-year College Students of Color. *Journal of Research on Adolescence*, *34*(1), 96-113. <https://doi.org/10.1111/jora.12897>
- Seema, R., Våljas, J., & Oppi, P. (2024). Symptoms of Digital Addiction of Estonian Primary School Students. <https://doi.org/10.20944/preprints202405.1954.v1>
- Sl, A. S., Aziz, A. R., & Huda, N. (2023). The Relationship Between the Intensity of the Use of the Tiktok Application and the Mental Health of Nursing Students. *Jetish Journal of Education Technology Information Social Sciences and Health*, *2*(2), 1678-1688. <https://doi.org/10.57235/jetish.v2i2.889>
- Song, T. Z., Zhu, H., Yang, K., Chang, W., & Ni, J. (2025). How Mobile Phone Addiction Leads to College Students' Learning Burnout: The Role of Depression as a Mediator and Fear of Missing Out as a Moderator. *Frontiers in Psychiatry*, *16*. <https://doi.org/10.3389/fpsy.2025.1569340>
- Song, W., Wang, Z., & Zhang, R. (2022). Classroom Digital Teaching and College Students' Academic Burnout in the Post COVID-19 Era: A Cross-Sectional Study. *International journal of environmental research and public health*, *19*(20), 13403. <https://doi.org/10.3390/ijerph192013403>
- Tasijawa, F. A., Madiuw, D., & Leutualy, V. (2024). Smartphone Addiction Among Nursing and Health Students. *The Malaysian Journal of Nursing*, *15*(03), 186-198. <https://doi.org/10.31674/mjn.2024.v15i03.021>
- Tomaszek, K., & Muchacka-Cymerman, A. (2021). Be Aware of Burnout! The Role of Changes in Academic Burnout in Problematic Facebook Usage Among University Students. *International journal of environmental research and public health*, *18*(15), 8055. <https://doi.org/10.3390/ijerph18158055>
- Tomaszek, K., & Muchacka-Cymerman, A. (2022). Face the Burnout! Link Between Academic Burnout, Facebook Use Motives and Importance, and Facebook Intrusion: A Longitudinal Study. *Roczniki Psychologiczne*, *25*(3), 251-270. <https://doi.org/10.18290/rpsych2022.0017>
- Vazsonyi, A. T., Javakhishvili, M., Lobo-Dos-Santos, T. A., Özdemir, Y., & Sağkal, A. S. (2024). Developmental Changes in School Burnout: The Importance of Sleep and Problematic Internet Use. *Journal of adolescence*, *96*(5), 1091-1101. <https://doi.org/10.1002/jad.12319>
- Ye, S., Wang, R., Pan, H., Zhao, F., Li, W., Xing, J., & Wu, J. (2023). Development and Validation of a Prediction Nomogram for Academic Burnout Among Chinese Adolescents: A Cross-Sectional Study. *BMJ open*, *13*(5), e068370. <https://doi.org/10.1136/bmjopen-2022-068370>
- Ye, X., Li, Y., Liu, Y., Zheng, Q., Lin, Z. W., Yin-hua, Z., Lin, Z., Zhu, T., Chen, X., Chen, L., & Liu, T. (2023). Effect of Fear of Missing Out on Learning Burnout in Medical Students: A Moderated Mediation. *Frontiers in Psychiatry*, *14*. <https://doi.org/10.3389/fpsy.2023.1289906>
- Yu, D. J., Wing, Y. K., Li, T. M. H., & 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. <https://doi.org/10.1007/s11920-024-01481-9>
- Yu, L., Chen, Z., Huang, X., Tao, X., & Lv, Y. (2025). The Relationship Between Physical Activity and Mobile Phone Addiction in College Students: A Systematic Review and Meta-Analysis. *Behavioral Sciences*, *15*(10), 1325. <https://doi.org/10.3390/bs15101325>
- Zhong, Y., Ma, H., Liang, Y., Liao, C., Zhang, C., & Jiang, W. (2022). Prevalence of Smartphone Addiction Among Asian Medical Students: A Meta-Analysis of Multinational Observational Studies. *International Journal of Social Psychiatry*, *68*(6), 1171-1183. <https://doi.org/10.1177/00207640221089535>
- Zhu, X., Zheng, T., Ding, L., Zhang, X., Li, Z., & Jiang, H. (2023). Exploring Associations Between Social Media Addiction, Social Media Fatigue, Fear of Missing Out and Sleep Quality Among University Students: A Cross-Section Study. *PLoS One*, *18*(10), e0292429. <https://doi.org/10.1371/journal.pone.0292429>