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From Stress to Screens: How Internet Use, Loneliness, and Social Media Habits Relate to Cyberbullying Perpetration

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Abstract. Cyberspace has become essential, offering both benefits and challenges, notably the emergence of cyberbullying. This study aimed to assess the prevalence of cyberbullying perpetration and understand how factors like Problematic Internet Use (PIU), stress, loneliness, social media duration, and frequency of fighting contribute among middle school students. It also examined subjective well-being (SWB). Selected through cluster random sampling, the study involved 768 students (50.5% girls, 49.5% boys) aged 12–16 from 16 middle schools in Bandung City (*M* age = 14.02). Data collection utilized the General Problematic Internet Use Scale 2 (GPIUS2), stress and loneliness scales, a questionnaire on social media use duration and school fights frequency, Children's World Subjective Well-Being Scale 5 items (CW-SWBS5), and the Cyberbullying Offending Scale. Data were analyzed using descriptive methods and linear regression. Findings highlighted that mood regulation (p = .028), negative PIU outcomes (p = .003), stress (p = .004), loneliness (p = .003), social media duration (p = .036), and school fights frequency (p = .000) predict cyberbullying. More boys (24.1%) engage in cyberbullying than girls (16.5%). Generally, girls reported lower SWB scores (*M* = 67.17) than boys (*M* = 74.59). Parents and teachers should make efforts to prevent both girls and boys from engaging in cyberbullying, in order to help them maintain their SWB at an above-average level.

Keywords: cyberbullying perpetrator; gender; problematic internet use; social media use duration; subjective well-being

In recent years, technological progress and online tools have transformed how we access information, express ideas, communicate, and interact with others. For students, the Internet serves as an educational resource and a platform for socializing and forming friendships. However, alongside the positive impacts of the Internet, there are also negative consequences stemming from misuse (Caplan, 2010). Among these negative effects is the increasing occurrence of cyberbullying (Patchin & Hinduja, 2015). Cyberbullying is a modern iteration of bullying that transcends traditional time and space boundaries, posing challenges for victims seeking escape (Coelho & Romão, 2018). According to Patchin and Hinduja (2015), cyberbullying is a deliberate, repetitive use of computers, cell phones, and other electronic devices to inflict harm. Hinduja and Patchin (2014) further characterized cyberbullying

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as the intentional and repeated hostile behavior toward others via the Internet, using devices like computers, tablets, and mobile phones. Research indicates that cyberbullying tends to be prevalent in adolescence (Yen et al., 2014), and it may continue into adulthood, but typically declines in late adolescence (Antoniadou & Kokkinos, 2015). Factors like anonymity and the lack of immediate consequences for perpetrators contribute to the persistence of cyberbullying (Campbell et al., 2013).

Cyberbullying generally occurs at home, but it is important to consider the school as children and adolescents spend a significant amount of their time there (Espelage et al., 2023). Olweus (2012) argued that the cyberbullying phenomenon does not create new victims or perpetrators, as those involved are typically participants in various forms of traditional bullying. X. Wang et al. (2021) and Barlett et al. (2024) also asserted a connection between traditional bullying and cyberbullying. Boulton et al. (2013) discovered that teachers' responses to cyberbullying in the United Kingdom (UK) mirror their responses to traditional verbal bullying. Meanwhile, Kowalski et al. (2023) found many similarities between traditional bullying and cyberbullying, including shared predictive factors and outcomes.

Several studies have investigated the impact of cyberbullying on students. Studies indicate that being bullied online can lead to increased school absenteeism and a decline in academic achievement (Gershenson et al., 2017; Torres et al., 2020). A study conducted in South Africa found that over half of the participants experienced cyberbullying, which adversely affected them emotionally and academically, with some reporting suicidal thoughts (Farhangpour et al., 2019). Similarly, suicidal ideation was observed among female Chinese college students who were victims of cyberbullying (Zou et al., 2023). Another study involving Ghanaian students revealed that cyberbullying victims often struggle with difficulty in trusting others, low self-esteem, and heightened stress levels (Tetteh et al., 2023). Okumu et al. (2020) also found that both face-to-face bullying and cyberbullying are associated with poor academic performance.

Several studies have shown that Problematic Internet Use (PIU), stress, and loneliness contribute to cyberbullying. Research in the UK revealed that adolescents aged 16–18 with low empathy and loneliness have a higher tendency to exhibit bullying behavior (Brewer & Kerslake, 2015). Another study conducted in China during the COVID-19 pandemic also showed that adolescents involved in cyberbullying experience loneliness (Han et al., 2021). A study involving Scottish adolescents found that those heavily invested in social media tend to have poor sleep quality, low self-esteem, heightened anxiety, and increased depression levels (Woods & Scott, 2016). Disconnection from social media platforms could potentially lead to isolation and stress, contributing to elevated levels of anxiety and depression (Woods & Scott, 2016).

Despite various conceptualizations of PIU, the construct primarily involves a loss of control over managing Internet usage time and accessing risky applications and activities. Two longitudinal studies reported such results (Anderson et al., 2017; Ciarrochi et al., 2016). Caplan (2018) described PIU not merely as a behavioral addiction but as a distinct pattern of Internet-related thoughts and behaviors that lead to adverse life outcomes. Caplan (2018) distinguished between two forms of PIU: specific and generalized. Specific PIU involves excessive use or misuse of certain Internet functions (e.g., gambling,

stock trading, or viewing sexual content), suggesting that individuals with such behavioral tendencies might substitute these activities if Internet access were restricted. Meanwhile, generalized PIU is characterized by multifaceted excessive Internet use, resulting in negative personal and professional consequences (Caplan, 2018). Symptoms include dysfunctional cognitions and behaviors related to Internet use that are not tied to specific content but rather to the unique nature of the Internet. Essentially, individuals affected by generalized PIU are drawn to the online experience and prefer virtual interactions over face-to-face communication.

Caplan (2018) criticized the literature on PIU for lacking a theoretical framework that differentiates various types of PIU. Much of the research has either focused solely on specific forms, like online gambling, or prioritized the quantity of time individuals spend online rather than investigating their motivations for being online. As mentioned earlier, Caplan (2018) asserted that generalized PIU is particularly significant for researchers because it emphasizes the psychological, social, and behavioral challenges arising from engagement in the distinctive social environment facilitated by the Internet. Caplan (2010) then developed the Generalized Problematic Internet Use Scale 2 (GPIUS2) that is based on several cognitive and behavioral constructs associated with negative outcomes of Internet use: preference for online social interaction (POSI), mood regulation, cognitive preoccupation, compulsive internet use, and negative outcomes.

Gender differences have been extensively studied. A study in 46 countries indicates that boys tend to be both perpetrators and victims more frequently than girls in traditional bullying (Cosma et al., 2022). A systematic review encompassing 21 studies in East Asian countries further supported this, highlighting that bullying perpetrators are commonly boys (Park et al., 2021). Research conducted in Indonesia during COVID-19 on cyberbullying also indicates that male students are more frequently involved as perpetrators (Borualogo, Wahyudi, & Kusdiyati, 2023).

Apart from PIU and gender differences, we suspected that social media usage duration and the frequency of fights between students in school also contribute to cyberbullying perpetration. This is supported by research conducted by Craig et al. (2020), which demonstrated how internet and social media use duration correlate with cyberbullying perpetration. Considering Olweus (2012) assertion that cyberbullying is not a distinct phenomenon and is not different from traditional bullying, we also examined the frequency of fights between students in schools. By testing several variables as predictors, we aimed to provide a more comprehensive overview of the predictors of cyberbullying.

Few studies have linked cyberbullying to subjective well-being. For example, a study involving adolescents in Hong Kong found that girls' well-being was adversely affected by engaging in cyberbullying (Tao et al., 2024). Other studies have focused on the subjective well-being of individuals who have been victims of cyberbullying (Andreou et al., 2020; Rodriguez-Rivas et al., 2022; Víllora et al., 2020).

The current study employed Cummins' homeostasis theory of subjective well-being (SWB) (Cummins, 2014), which posits that despite encountering adverse circumstances, individuals actively regulate and sustain SWB, akin to how the body regulates temperature. SWB homeostasis aims at upholding consistent positive well-being, conceptualized as broad and abstract (Cummins, 2014).

Cummins (2014) suggested that when individuals assess their overall life satisfaction, their responses reflect not only cognitive evaluations but also a profound, enduring positive mood inherent to SWB. This generalized positive mood is the focus of homeostatic regulation (Cummins, 2014).

According to Cummins (2014), each individual's homeostatic system maintains an SWB range of 60 to 90 on a hypothetical 100-point scale, with an average of 75. Variations around this set point are typically around 6% points on either side of the mean (Cummins, 2014). The theory predicts that if an individual experiences situations lowering SWB below the threshold, the homeostatic system works to restore SWB to the normal range, which also involves an adaptation process.

However, when individuals face ongoing external stressors or adverse life experiences, this internal balance can be disrupted, leading to compensatory behaviors aimed at regaining emotional stability. In this research, the theory helped explain how adolescents may turn into cyberbullying perpetrators when their SWB is destabilized by factors like PIU, stress, feelings of loneliness, frequent peer conflicts at school, and prolonged social media activity.

To begin with, stress and loneliness act as emotional disruptors that can challenge the stability of SWB. Adolescents who experience these emotional strains often turn to the internet in search of comfort or distraction. However, if their coping methods are ineffective, they may be more inclined to adopt harmful behaviors, such as cyberbullying, to vent emotions, regain a sense of control, or be accepted by peers.

PIU, particularly the aspects related to emotion regulation and negative consequences, may also represent an effort to reestablish psychological balance through digital means. Caplan (2010) noted that people often use the Internet to cope with distressing emotions. However, if this use becomes excessive or compulsive, it may instead heighten emotional instability and social disconnection, which can lead to aggressive online behaviors.

Additionally, spending extended periods on social media increases exposure to negative digital interactions, e.g., exclusion or hostility. Similarly, frequent fights in school reflect broader social conflict. Together, these stressors can destabilize an adolescent's SWB and increase the likelihood of responding with cyberbullying, especially as a continuation of tensions in the real world.

Cyberbullying itself may be seen as an unsuccessful coping mechanism. While it might initially offer a sense of relief, power, or inclusion, findings have suggested that perpetrators—particularly girls—report lower levels of SWB. This implies that the behavior does not achieve its intended effect of emotion regulation and may further harm SWB.

To conclude, Cummins (2014) homeostasis theory provides a useful framework for understanding how adolescents' SWB can be threatened by psychosocial stressors and how cyberbullying may emerge as a maladaptive effort to maintain or restore well-being. This understanding highlights the need for early emotional support, digital literacy education, and relational interventions to reinforce adaptive coping and maintain SWB in adolescents.

While multiple studies have suggested that PIU, stress, and loneliness play a role in cyberbullying, research on the topic in Indonesia is still limited. There may be insufficient awareness regarding the prevalence and effects of cyberbullying in the country. Besides, social attitudes may affect

how cyberbullying is perceived and reported. In some cases, there may be shame associated with being cyberbullying victims, which could discourage individuals from reporting the incidents. There remain numerous factors to investigate in an effort to comprehend the mechanisms of cyberbullying. Given the lack of research on cyberbullying in Indonesia, the present study is essential. Additionally, research in Indonesia often emphasizes the victims (Borualogo et al., 2024), with limited information available about the perpetrators.

There were two aims of this study. Firstly, to investigate the prevalence of cyberbullying perpetration. Secondly, to explore how factors like PIU, stress, loneliness, gender, duration of social media usage, and the frequency of fights between students in school contribute to the occurrence of cyberbullying perpetration. This study can raise awareness in parents, teachers, and policymakers about cyberbullying perpetration, thereby facilitating efforts to prevent it. The hypothesis of this research was that PIU, gender, duration of social media use, and the frequency of fights between students in school would predict cyberbullying perpetration.

Methods

Participants

To obtain a representative sample, this study employed cluster random sampling. Sixteen middle schools in Bandung City participated (N = 768 students, n = 388, 50.5% girls; n = 380, 49.5% boys). Participants were students from grades 7, 8, and 9, aged 12–16 years old at the time of study (Mage = 14.02). Table 1 provides detailed participant characteristics.

Table 1

Participant Characteristics

	Girls		Boys		Total	
	n	%	*n*	%	*n*	%
Age						
12 years-old	20	2.6	25	3.3	45	5.9
13 years-old	114	14.8	84	10.9	198	25.8
14 years-old	144	18.8	122	15.9	266	34.6
15 years-old	96	12.5	122	15.9	218	28.4
16 years-old	14	1.8	27	3.5	41	5.3
Grade						
7	109	14.2	117	15.2	226	29.4
8	168	21.9	134	17.4	302	39.3
9	111	14.5	129	16.8	240	31.3
Total	388	50.5	380	49.5	768	100

Procedure

Data were collected from February to May 2024. Questionnaires were distributed in classrooms across 14 schools by enumerators, online and in-class, while two schools opted for paper and pencil data

collection on-site. Parents and teachers were informed about the study and received consent requests via WhatsApp. Consent was obtained through a Google Form.

Participants completed the questionnaires using Google Form. They were encouraged to provide truthful and voluntary, anonymous responses. The questionnaire took approximately 30–40 minutes to complete. Ethical approval for this study was granted by the Nusantara Scientific Psychology Consortium (K-PIN) under approval number 009/2024/Etik/KPIN dated January 25, 2024.

Instruments

The Indonesian version of the Cyberbullying Offending Scale by Patchin and Hinduja (2015), translated by Borualogo, Kusdiyati, and Wahyudi (2023) and Patchin and Hinduja (2015), was used to measure cyberbullying perpetration. There are nine items included in this questionnaire. The examples of items are: "I have been cyberbullied"; and "Someone posted mean or hurtful comments about me online". Responses were measured on a 4-point Likert scale ranging from never (score = 0), once (score 1), a few times (score 2), several times (score 3), and many times (score = 4). Based on norm scores were categorized as follows: (1) no problem (total scores = 0 -– 1); (2) minor cyberbullying perpetration (scores $\geq$ 85th percentile and < 95th percentile); (3) severe cyberbullying perpetration (score $\geq$ 95th percentile) (Yudes-Gómez et al., 2018). The Cronbach's alpha for Cyberbullying Offending Scale was .67 (Borualogo, Kusdiyati, & Wahyudi, 2023). Items' validity ranges from .374 – .710 (Borualogo, Kusdiyati, & Wahyudi, 2023).

General Problematic Internet Use Scale 2 (GPIUS2) by Caplan (2010), which was translated into the Indonesian language, was used to measure PIU. This 15-item questionnaire includes five subscales: (1) preference for online social interaction (POSI); (2) mood regulation; (3) cognitive preoccupation; (4) compulsive Internet use; and (5) negative outcomes. The examples of items are: (1) "I prefer online social interaction over face-to-face communication"; (2) "I have used the internet to talk with others when I was feeling isolated"; (3) "When I haven't been online for some time, I become preoccupied with the thought of going online"; (4)"I have difficulty controlling the amount of time I spend online"; and (5) "My internet use has made it difficult for me to manage my life". Responses were measured on a 6-point Likert scale ranging from 1 ("definitely disagree") to 6 ("definitely agree"). The overall composite score for GPIUS2 indicates high reliability (α = .931), with individual factors exhibiting reliability as follows: POSI (α = .929), mood regulation (α = .849), cognitive preoccupation (α = .865), compulsive internet use (α = .867), and negative outcomes (α = .864). Item validity ranges from .606 to .795 (p < .001).

The Children's Worlds Subjective Well-Being Scale 5 items (CW-SWBS5) is a multi-item cognitive, context-free psychometric scale (Rees et al., 2020). It was validated and translated into Indonesian by Borualogo and Casas (2019). Each item employs an 11-point scale ranging from 0 = do not agree at all to 10 = totally agree. The items are: (1) "I enjoy my life"; (2) "My life is going well"; (3) "I have a good life"; (4) "The things that happen in my life are excellent"; and (5) "I am happy with my life". In Indonesia, using representative samples, the fit indices for 10-year-olds were X^2 = 75.17, df

= 5, p = .000, comparative fit index (CFI) = .995, and root mean square error of approximation (RMSEA) = .043 (.035 – .052) (Borualogo & Casas, 2019). For 12–year-olds, the original fit indices were X^2 = 93.79, df = 5, p = .000, CFI = .995 and RMSEA = .047 (.039 – .056) (Borualogo & Casas, 2019).

Stress and loneliness were measured using a single item asking participants to rate how much they had felt stress and loneliness over the past two weeks. This measurement tool was adapted from the Children's Worlds project (Rees et al., 2020). Scores were assessed on a 10-point scale, where 0 indicates no feeling of stress or loneliness at all, and 10 indicates an extreme feeling of stress or loneliness.

The duration of social media usage was measured by asking participants, "How long do you spend using social media per day?" The options provided were 1–4 hours, 4–5 hours, and more than 5 hours. Participants were asked, "How often do fights occur among children in your school?" The response options range from 1 = Never, 2 = Rarely, 3 = At least once a week, 4 = Almost every day, and 5 = Every day.

Data Analysis

Data analysis was conducted using descriptive statistics by calculating the frequencies of the observed variables. Additionally, the analysis included testing mean differences, chi-square, ANOVA (analysis of variance), Pearson correlation, and multiple linear regression. These methods were employed to describe the data characteristics, identify significant differences between groups, measure relationships between variables, and model complex relationships between multiple independent and dependent variables.

Results

Table 2 shows the differences across types of school, grade, and gender in total scores for cyberbullying perpetration. No significant differences were observed across types of school and grade. The percentage of boys with minor (20.1%) and severe (4.0%) levels of cyberbullying perpetration was higher than girls (14.7% and 1.8%, respectively). The percentage of girls with no problem (34.0%) was higher than boys (25.4%).

Table 2

Percentage of Severity of Cyberbullying Perpetration by Type of School, Grade, and Gender

Category	No problem n (%)	Minor problem n (%)	Severe problem n (%)	Total n (%)	χ^2
Type of school					
Public school	205 (26.7)	106 (13.8)	14 (1.8)	325 (42.3)	.113
Private school	251 (32.7)	161 (21.0)	31 (4.0)	443 (57.7)	
Religious school	187 (24.3)	121 (15.8)	26 (3.4)	334 (43.5)	.073
Non-religious school	269 (35.0)	146 (19.0)	19 (2.5)	434 (56.5)	

Table 2 (Continued)

Percentage of Severity of Cyberbullying Perpetration by Type of School, Grade, and Gender

Category	No problem n (%)	Minor problem n (%)	Severe problem n (%)	Total n (%)	χ^2
Grade					
Grade 7	127 (16.5)	82 (10.7)	17 (2.2)	226 (29.4)	.550
Grade 8	182 (23.7)	102 (13.3)	18 (2.3)	302 (39.3)	
Grade 9	147 (19.1)	83 (10.8)	10 (1.3)	240 (31.3)	
Gender					
Girls	261 (34.0)	113 (14.7)	14 (1.8)	388 (50.5)	.000**
Boys	195 (25.4)	154 (20.1)	31 (4.0)	380 (49.5)	
Total	456 (59.4)	267 (34.8)	45 (5.9)	768 (100)	

**$p < .01$

Table 3 displays gender-based differences across the variables examined in this study. There were no significant differences observed across types of school and grades. Girls reported higher mean scores in stress (M = 3.98), loneliness (M = 5.47), duration of social media use (M = 2.30), frequency of fights between students (M = 2.20), and GPIUS2 subscales; i.e., POSI (M = 2.77), mood regulation (M = 3.62), and compulsive internet use (M = 2.54), than boys (M = 2.04; M = 2.64; M = 3.72; M = 2.04; M = 1.96; M = 2.35; M = 3.14; M = 2.33, respectively). Additionally, girls reported significantly higher levels of PIU (M = 2.61) than boys (M = 2.37). Mean differences of GPIUS2 subscales, stress, loneliness, frequency of fights between students, and duration of using social media across gender

Table 3

Mean Differences Of Gpius2 Subscales, Stress, Loneliness, Frequency Of Fights Between Students, And Duration Of Using Social Media Across Gender

	Girls		Boys		Total		p
	M	*SD*	*M*	*SD*	*M*	*SD*	
Stress	3.98	3.22	2.64	3.07	3.32	3.22	.000**
Loneliness	5.47	3.44	3.72	3.62	4.61	3.63	.000**
Frequency of fights	2.20	0.78	1.96	0.62	2.08	0.72	.000**
Duration of social media usage	2.30	0.79	2.04	0.84	2.17	0.82	.000**
POSI	2.77	1.51	2.35	1.55	2.56	1.54	.000**
Mood regulation	3.62	1.29	3.14	1.39	3.38	1.36	.000**
Cognitive preoccupation	2.18	1.45	2.09	1.38	2.14	1.42	.379
Compulsive internet use	2.54	1.52	2.33	1.47	2.44	1.49	.047*
Negative outcomes	1.95	1.47	1.96	1.41	1.96	1.44	.895
GPIUS2	2.61	1.15	2.37	1.15	2.49	1.16	.004*

*$p < .05$; **$p < .01$

All GPIUS2 subscales, stress, loneliness, frequency of fights between students at school, and duration of social media use were found to have positive and significant correlations with cyberbullying perpetration and other variables, as shown in Table 4. The type of school showed

a significant correlation with cyberbullying perpetration, but not with other variables, except for public-private schools with mood regulation, and religious-non-religious schools with public-private schools.

Table 4

Pearson Correlation for Variables in the Study

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Cyberbullying perpetration	-												
2. Stress	.077*	-											
3. Lonely	.085*	.481**	-										
4. Frequency of fights	.157**	.146**	.154**	-									
5. POSI	.155**	.131**	.200**	.096**	-								
6. Mood regulation	.108**	.183**	.218**	.122**	.591**	-							
7. Cognitive preoccupation	.106**	.152**	.156**	.080*	.496**	.526**	-						
8. Compulsive internet use	.134**	.197**	.177**	.111**	.475**	.503**	.707**	-					
9. Negative outcomes	.189**	.161**	.164**	.087*	.414**	.370**	.644**	.739**	-				
10. GPIUS2	.148**	.206**	.229**	.116**	.752**	.742**	.843**	.859**	.794**	-			
11. Duration of social media	.095**	.171**	.160**	.116**	.187**	.219**	.172**	.222**	.169**	.243**	-		
12. Public-private School	.074*	-.032	.050	-.026	-.013	-.074*	-.022	-.025	.023	-.027	-.007	-	
13. Religious-non-religious	-.077*	.027	.023	-.009	-.027	.015	-.017	-.021	-.063	-.029	.057	-.443**	-

Note: $^{*}p < .05$; $^{**}p < .01$

Table 5 presents the results of linear regression analyses to identify predictors of cyberbullying perpetration, including GPIUS2 subscales, frequency of fights between students, duration of social media use, stress, loneliness, type of school, grade, and gender. The model accounted for 10.2% of the variability in cyberbullying perpetration. Gender emerged as the strongest predictor (β = .232; p < .01), indicating that boys are more likely to engage in cyberbullying perpetration than girls. Types of school, public-private (β = .054; p = .164) and religious-non-religious (β = -.047; p = .264), were not found to predict cyberbullying perpetration.

Factors that predict cyberbullying perpetration are mood regulation (β = .105; p < .05), negative outcomes (β = .160; p < .01), frequency of fights between children at school (β = .157; p < .01), duration of social media use (β = .077; p < .05), stress (β = .091; p < .01), and loneliness (β = .073; p < .01). These findings suggest that higher levels of mood dysregulation, negative outcomes associated with Internet use, frequent fights between students, longer duration of social media use, elevated stress levels, and loneliness are associated with increased likelihood of engaging in cyberbullying as perpetrators.

Table 5

Multiple Linear Regressions of Cyberbullying Perpetration

Predictor	B	SE	β	t	p	95% CI	
						Lower	Upper
Public-Private	0.066	0.048	0.054	1.393	.164	-0.027	0.159
Religious-Non religious	-0.057	0.051	-0.047	-1.118	.264	-0.157	0.043
Grade	-0.035	0.030	-0.045	-1.168	.243	-0.093	0.024
Gender	0.280	0.044	0.232	6.289	.000**	0.192	0.367
POSI	-0.028	0.018	-0.071	-1.573	.116	-0.063	0.007
MR	0.047	0.021	0.105	2.208	.028*	0.005	0.088
CP	-0.011	0.023	-0.025	-0.462	.644	-0.056	0.035
CIU	-0.011	0.024	-0.027	-0.453	.651	-0.059	0.037
NO	0.067	0.023	0.160	2.940	.003**	0.022	0.112
Fight Frequency	0.133	0.030	0.157	4.378	.000**	0.074	0.193
Social Media Use	0.056	0.027	0.077	2.100	.036*	0.004	0.109
Stress	0.085	0.073	0.091	2.541	.004**	-0.003	0.027
Loneliness	0.062	0.082	0.073	2.976	.003**	0.009	0.024

Note: $F(12, 741) = 8.123$, $p < .001$, Adjusted $R^2 = .102$

$^{*}p < .05$; $^{**}p < .01$

Table 6 displays mean differences in SWB based on gender and severity of cyberbullying perpetration. Girls reported notably lower SWB scores (M = 67.17; SD = 27.07) than boys (M = 74.59; SD = 26.33). Among boys, those who reported no problem (M = 75.73; SD = 26.66) exhibited significantly higher SWB scores than those in other categories. Boys who reported severe cyberbullying perpetration problems (M = 64.97; SD = 27.74) displayed the lowest SWB scores. In contrast, girls who reported severe cyberbullying perpetration problems (M = 68.00; SD = 27.85) demonstrated the highest SWB scores. The lowest SWB scores were observed among girls who reported minor cyberbullying (M = 65.22; SD = 25.12).

Table 6

Mean Differences of SWB Based on Gender and Severity of Bullying Perpetration

	Girls			Boys			Total			
Severity Level	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*p*
No problem	67.97	27.88	261	75.73	26.66	195	71.29	27.61	456	.000
Minor problem	65.22	25.12	113	75.09	25.39	154	70.91	25.69	267	
Severe problem	68.00	27.85	14	64.97	27.74	31	65.91	27.49	45	
Total	67.17	27.07	388	74.59	26.33	380	70.84	26.95	768	

Discussion

This study aimed to investigate the prevalence of cyberbullying perpetration and the contribution of PIU, stress, loneliness, gender, social media usage duration, and frequency of fights between students at school to the occurrence of cyberbullying perpetration. The research findings will be presented in the discussion, along with their implications.

The prevalence of cyberbullying perpetration was higher among boys than girls. This finding is consistent with research conducted by Wiguna et al. (2018) on Indonesian adolescents. Cyberbullying perpetration occurs across all types of schools, but there is no significant difference observed among these school types. This finding contrasts with a previous study in Indonesia, which found that school bullying is more prevalent in public and non-religious schools (Borualogo et al., 2024). Despite the lack of difference among school types, cyberbullying was on an upward trend, evidenced by a growing number of students engaging in cyberbullying perpetration. This trend warrants serious attention from educators and parents, as cyberbullying is becoming more prevalent alongside the traditional form of school bullying. Borualogo et al. (2024) also suggested that cyberbullying incidence has increased post-COVID-19 pandemic and continues to trend upwards, possibly due to a shift from in-person school bullying to online platforms.

To understand the predictors of cyberbullying perpetration, we examined PIU, stress, loneliness, frequency of fights between students, and duration of social media use. The results indicate that PIU is a predictor of cyberbullying perpetration, although not all dimensions significantly predicted cyberbullying perpetration. Specifically, two dimensions, mood regulation and negative outcomes, were identified as strong predictors driving individuals to engage in cyberbullying. Cross-cultural research conducted in Colombia, Uruguay, and Spain by Yudes-Gómez et al. (2018) showed similar findings, albeit with different implications. Mood regulation was found to predict cyberbullying victimization, while negative outcomes predict cyberbullying perpetration (Yudes-Gómez et al., 2018). Difficulty in emotion regulation in adolescents is often associated with PIU (Günaydın et al., 2021). Mood regulation refers to situations where individuals use the internet to communicate with others when feeling isolated, to uplift themselves when feeling down, and to alleviate frustration (Caplan, 2010). Negative outcomes encompass situations where internet use complicates one's capacity to manage life, leading to declines in activities and social engagements, and creating problems in their lives (Caplan, 2010).

The current study indicates that gender is a significant predictor of cyberbullying perpetration, with boys having a higher likelihood of being perpetrators than girls. The referenced studies demonstrate consistency in these findings across various cultural contexts, including China and Türkiye. X. Wang et al. (2021), reported that adolescent boys are more likely to be involved in cyberbullying when experiencing significant online disinhibition. These results are consistent with

another study by X. Wang et al. (2023), which showed that cyberbullying perpetrated by boys is more frequent than that by girls in China. Yirci et al. (2021) also found that high school boys in Türkiye show a higher tendency to engage in cyberbullying compared to girls.

In conclusion, findings across multiple studies consistently indicate that boys are more likely to engage in cyberbullying compared to girls. Factors, e.g., online disinhibition, differences in online behaviors, and interactions of adolescent boys and girls, may help explain these results. This is supported by research conducted by Handono et al. (2019) among adolescents in Jakarta, as well as cross-cultural studies by Yudes-Gómez et al. (2018) involving adolescents in Colombia, Uruguay, and Spain. Shin and Kim (2023) also found that problematic mobile phone use is associated with cyberbullying among adolescents in South Korea.

Stress and loneliness are predictors of cyberbullying perpetration, triggering negative emotional states that contribute to such behaviors. These findings align with preceeding studies, such as Brewer and Kerslake (2015) on English adolescents and Tong et al. (2024) on Chinese adolescents. Similar results were found by Varela et al. (2022) and X. Wang et al. (2021) regarding cyberbullying during the pandemic in Chile.

When individuals experience loneliness, they tend to increase their online activities in an attempt to connect with others. However, they often fail to alleviate loneliness and may instead intensify it, potentially leading to stress. The sense of isolation that accompanies loneliness often drives individuals to seek solace on the internet, which can offer distraction from these feelings.

Both loneliness and stress can predict PIU as they drive individuals to seek social connections and emotional fulfillment online. Unfortunately, cyberbullying can emerge as a consequence of these interactions. The Internet can serve as a refuge from loneliness, underscoring the importance for parents to understand these dynamics and assist their children in managing PIU effectively.

The time spent on social media also predicts cyberbullying perpetration. Increased social media use is associated with a higher probability of engaging in cyberbullying. Girls typically spend close to five hours daily on social media, whereas boys typically spend approximately 4–5 hours. This finding is consistent with Craig et al. (2020) research on adolescents from 42 countries, which links increased online time to socioemotional and moral development challenges. Moreover, girls tend to experience more problematic use than boys, largely due to their greater online time (Craig et al., 2020).

Cyberbullying perpetration in Indonesia correlates with the frequency of fights among students at school. These findings were consistent with research conducted by M. Wang et al. (2022), who investigated the longitudinal connection between traditional bullying victimization and cyberbullying perpetration among elementary school students in China. Their study revealed that being the victim of traditional bullying may increase the likelihood of engaging in cyberbullying among boys. Similarly, Barlett et al. (2024) found that this correlation persists even when accounting for traditional bullying. These results emphasize the need for parents and teachers to monitor school bullying as part of efforts to prevent and address cyberbullying effectively.

The study revealed that adolescents involved in cyberbullying perpetration have lower SWB scores, even lower than those who experienced bullying during and after the COVID-19 pandemic (Borualogo, Wahyudi, & Kusdiyati, 2023; Borualogo et al., 2024). This is concerning because both boys and girls severely involved in cyberbullying perpetration reported SWB levels below the average, as explained by Cummins (2014) about homeostasis theory. Girls are especially affected, with those reporting minor problems having the lowest SWB levels. Girls in the study reported higher levels of stress, loneliness, and problematic internet use, while boys were more likely to express these difficulties through cyberbullying. These patterns align with gender differences in emotional expression and

suggest a need for gender-sensitive mitigation strategies. These findings are consistent with research in Hong Kong, which showed that engaging in cyberbullying negatively impacts girls' SWB (Tao et al., 2024). While boys demonstrate some ability to adapt to a minor level of perpetration, parents and educators must intervene to prevent their participation in cyberbullying. Efforts should be made to prevent both girls and boys from engaging in cyberbullying perpetration, so that they can maintain their SWB above the average, according to Cummins' theory of homeostasis (Cummins, 2014).

Conclusion

Cyberbullying perpetration is a concerning issue, yet research on this topic in Indonesia remains limited, leaving numerous variables undisclosed. This study revealed that boys engage more frequently in cyberbullying perpetration than girls, despite boys showing higher SWB scores than girls. PIU, stress, loneliness, duration of social media usage, and frequency of fights between students at school predict cyberbullying perpetration. It appears that cyberbullying is indeed associated with the traditional form of school bullying, as it involves conflicts at school that are continued in cyberspace, as shown by cyberbullying perpetration. This study had some limitations. It focused only on middle school students, thus unable to explain cyberbullying perpetration among elementary and high school students. Moreover, the study examined specific variables, acknowledging that there are likely many other factors predicting cyberbullying perpetration. Future research is essential to explore these variables among elementary and high school students. Despite these limitations, the study significantly contributes to advancing cyberbullying research in Indonesia.

Recommendation

It is crucial for parents and teachers to be attentive toward adolescents, particularly concerning their PIU, stress levels, and experiences of loneliness. Parents should dedicate time to their children to help them mitigate loneliness and stress. Additionally, it is important for adults to supervise adolescents' internet and social media use, implementing restrictions (e.g., less than 2 hours per day), and offering diverse offline activities. Furthermore, the occurrence of fights between students at school predicts cyberbullying perpetration. Teachers should closely monitor students to prevent schoolyard altercations from escalating into cyberbullying incidents.

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Authors' Contributions

ISB designed the study, led in the data collection, conducted the data analysis, wrote the results and discussion, and wrote the article. AM and DD contributed equally to conducting the study. All authors read and approved the final version of the manuscript.

Conflict of Interest

The authors declare no conflict of interest to disclose.

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