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Understanding adolescent cyberbullying: The mediating role of problematic internet use in the associations between self-control, parental monitoring, and cyberbullying

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Abstract: Social media provides adolescents with opportunities for self-expression, but it also increases the risk of cyberbullying. This study examines the direct relationship between self-control and parental monitoring and cyberbullying, and investigates whether problematic internet use mediates the relationships. The study involved 2.517 secondary school students (M-age = 16.40; SD = 1.08) who were recruited through convenience sampling. Data were collected online using four scales: a Cyberbullying Scale, the Problematic Internet Use Scale, a Parental Monitoring Scale, and a Self-control Scale. Data were analyzed using path analysis with Jamovi software. The results show that problematic internet use mediated the effects of self-control ($\beta = -.035$, $p < .001$) and parental monitoring ($\beta = -.029$, $p < .001$) on cyberbullying. The findings highlight the need for integrated prevention strategies to strengthen adolescents' self-regulation, supportive parental monitoring, and healthy internet use through collaboration between schools, families, and communities.

Keywords: adolescent; cyberbullying; parental monitoring; problematic internet use; self-control; social media use

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Introduction

Cyberbullying can take place across multiple digital platforms, such as instant messaging, email, text messaging, websites, chat rooms, social media, digital photos, and online games (Kowalski et al., 2014). Examples include violent content shared via WhatsApp, abusive videos posted on sites such as YouTube, and derogatory comments on social networking platforms, all of which are considered forms of cyberbullying (Çakar-Mengü & Mengü, 2023). In their review of research from 2012 to 2017, Peter and Petermann (2018) described cyberbullying as the intentional and repeated use of information and communication technologies to harm, harass, or humiliate individuals. They also emphasized that anonymity, constant access, and a wide audience were key characteristics of the phenomenon.

Cyberbullying has a detrimental effect on individuals' personal lives (Zhong et al., 2021); work (Forssell, 2019; Makhulo, 2019); and education (Egeberg et al., 2016; Myers & Cowie, 2019). Its harmful consequences include mental strain (Coyne et al., 2017); job strain (N. Li et al., 2022); higher risk of burnout (Mushtaq et al., 2022); lower mindfulness (Lu et al., 2025); and a decline in overall well-being (Varela et al., 2025). Research indicates that these negative outcomes can extend to suicidal thoughts and intentions (Morales-Arjona et al., 2024). Recent evidence from Indonesia further supports this association, showing that cyberbullying victimization significantly predicts suicidal ideation among adolescents, with depression functioning as a partial mediator in this relationship (Subardjo et al., 2024).

For instance, Fekih-Romdhane et al. (2024) and Subardjo et al. (2024) found that victims of cyberbullying were at a greater risk of developing suicidal ideation. Strong links have been demonstrated between cyberbullying and psychological issues such as depression (Hu et al., 2021); anxiety; suicidal thinking; stress (Martínez-Monteagudo et al., 2020); aggression (Sobkin & Fedotova, 2021); substance use (Pichel et al., 2022); self-harm (Morales-Arjona et al., 2024); and poor self-control (Stults & You, 2022).

Cases related to cyberbullying behavior continue to increase around the world, and are not limited to developed countries such as Italy (Genta et al., 2012); Spain (Zych et al., 2016); England (Przybylski & Bowes, 2017); Germany (Schütz et al., 2022); France (Blaya, 2018); Japan (Udris, 2015); South Korea (Lee et al., 2018); the United States (Patchin & Hinduja, 2022), but increasingly rampant cases are also occurring in developing countries such as India (Maurya et al., 2022); Indonesia (Bukhori et al., 2024); Pakistan (Saleem et al., 2021); and Bangladesh (Sheikh et al., 2023), as well as low-income countries such as Ethiopia (Dagne & Sakata, 2025); Niger (Akeusola, 2024); Papua New Guinea (Siraba, 2019); and Southern Africa (Burton, 2016). In addition to the negative impacts of cyberbullying behavior, other effects are also felt concerning gender, as women are often perceived to be frequent victims of cyberbullying in developing countries (Cassiani-Miranda et al., 2022), with female school students being more vulnerable to cyber victimization (Baldry et al., 2017). In terms of age, research has shown that adolescence is the stage of life when individuals are most likely to engage in cyberbullying (Slonje et al., 2012).

Recently, cyberbullying behavior has received serious attention due to its highly detrimental effects on victims and the urgent need for appropriate intervention. The high usage of social media among adolescents can lead to various consequences, one of which is negative impacts such as cyberbullying behavior (Balas et al., 2023). Data indicate that teenagers are the most common perpetrators of cyberbullying. A study found that 20.5% of Indonesian adolescents aged 13 to 15 had experienced cyberbullying, while 84% of children between 12 and 17 had been bullied, with

the majority of these incidents being cases of cyberbullying (Wahanisa et al., 2021).

Previous studies have demonstrated that the determinants of cyberbullying behavior can be explained by two key factors: internal and external. Internal factors encompass aspects related to feelings, thoughts, and actions originating from within the individual, such as self-control. These factors are closely associated with how individuals regulate their emotions and internal impulses, enabling them to make decisions and take effective actions in line with ideal standards, moral values, and social expectations (de Ridder et al., 2011). Adolescents with good self-control are more likely to avoid engaging in cyberbullying behavior (Hoareau et al., 2023). Several comprehensive studies have emphasized the link between individuals' inability to control themselves and the emergence of cyberbullying behavior (Stults & You, 2022; H. Li et al., 2023). Furthermore, self-control has been found to mediate the relationship between aggressiveness and cyberbullying (Peker & Yildiz, 2021), indicating that aggressive behavior is more likely to occur when an individual has weak self-control.

Furthermore, external factors include perceptions of influences from outside that are relevant to an adolescent's life, such as parental monitoring. During adolescence, the relationship between parents and children generally becomes more prone to conflict and becomes cooler (Branje, 2018). There is a decline in openness and increased demands from adolescents towards their parents, and they tend to feel sufficiently independent from parental supervision (Lionetti et al., 2019). Nevertheless, support and positive communication between parents and children remain highly important for adolescents, as they can enhance social competence and prevent the emergence of cyberbullying behavior (Meter & Bauman, 2018). Previous research has demonstrated that parental monitoring can reduce such behavior (Álvarez-García et al., 2015; Paek et al., 2022).

Another risk factor that can contribute to the emergence of cyberbullying behavior is problematic internet use (PIU). Research has highlighted factors that may be related to cyberbullying behavior, such as the use of social media platforms (Craig et al., 2020), and PIU (Genta et al., 2012). PIU, now recognized as a global social concern, can generally be understood as a lack of control over internet usage that results in adverse effects on everyday life (Spada, 2014). Compulsive internet usage has been on the rise in recent years, especially among younger members of the population (Méndez et al., 2020). For adolescents, PIU is associated with various maladaptive phenomena, including excessive social media engagement, online gaming addiction, sleep disturbances, academic decline, emotional dysregulation, social withdrawal, and increased impulsive or aggressive behavior (Kuss & Lopez-Fernandez, 2016; Cheng & Li, 2014). Adolescents facing the problem also tend to experience higher levels of anxiety, depression, loneliness and difficulties in interpersonal relationships, which may increase their vulnerability to both perpetrating and experiencing cyberbullying (Marino et al., 2018). Furthermore, prolonged and uncontrolled internet use may reduce adolescents' ability to regulate their emotions and behavior, thereby increasing the likelihood of engaging in harmful online interactions, including cyberbullying.

PIU may also function as a mediating mechanism linking self-control and parental monitoring to cyberbullying behavior. Adolescents with low self-control may have greater difficulty regulating their online activities and impulses, which can increase the likelihood of excessive and uncontrolled internet use (D. Li et al., 2023; Méndez et al., 2020). Similarly, insufficient

parental monitoring may reduce supervision and guidance regarding their online behavior, allowing PIU to develop more easily (Paek et al., 2022; Livingstone & Helsper, 2008). In turn, it may increase adolescents' exposure to negative online interactions, emotional dysregulation, and impulsive behavior, thereby increasing the risk of engaging in cyberbullying (Marino et al., 2018). Therefore, PIU is expected to help explain how self-control and parental monitoring are indirectly associated with cyberbullying behavior among adolescents.

This study is grounded in several complementary theoretical perspectives that explain adolescents' involvement in cyberbullying. Social control theory highlights the importance of social bonds and parental supervision in preventing problematic behaviors (Hirschi, 1969), suggesting that parental monitoring may reduce adolescents' involvement in cyberbullying and PIU. Problem behavior theory conceptualizes problematic behaviors as interrelated and shaped by psychosocial vulnerability (Jessor & Jessor, 1977), implying that PIU may co-occur with or contribute to cyberbullying behavior. In addition, uses and gratifications theory suggests that adolescents may excessively engage with the internet to fulfill psychological and social needs (Katz et al., 1973), potentially increasing vulnerability to maladaptive online behaviors. Finally, ecological systems theory emphasizes the interaction between individual characteristics and environmental influences, such as family monitoring, in shaping adolescent behavior (Bronfenbrenner, 1981). Collectively, these theoretical perspectives provide a foundation for understanding how parental monitoring and PIU are associated with cyberbullying among adolescents.

Although previous studies have examined the relationships between self-control, parental monitoring, problematic internet use, and cyberbullying separately, several important gaps remain. First, most studies have focused only on the direct effects of individual factors, such as self-control, on cyberbullying (Stults & You, 2022; H. Li et al., 2023), or environmental factors, such as parental monitoring, on cyberbullying (Álvarez-García et al., 2015; Paek et al., 2022), with limited attention paid to how these factors interact through PIU. Second, research investigating PIU as a mediating mechanism linking internal and external factors to cyberbullying behavior remains limited, particularly among adolescents in developing countries (Genta et al., 2012; Marino et al., 2018). Third, much of the research has been conducted in Western or high-income contexts, such as the United States, Spain, Italy, and South Korea (Patchin & Hinduja, 2022; Zych et al., 2016; Genta et al., 2012; Lee et al., 2018), whereas empirical evidence from Indonesia remains scarce, despite the rapid increase in adolescent internet use and cyberbullying cases (Bukhori et al., 2024). Therefore, the novelty of this study lies in the integrative model developed, which simultaneously examines self-control and parental monitoring as predictors of cyberbullying through the mediating role of PIU among Indonesian adolescents. By employing latent-variable path analysis with a large adolescent sample, the study contributes to a more comprehensive understanding of how individual and environmental factors jointly influence cyberbullying behavior in a non-Western context.

Consequently, the study has two main aims: 1) to examine the associations between self-control, parental monitoring and problematic internet use, and cyberbullying behavior; and 2) to investigate whether PIU mediates the relationships between self-control and parental monitoring, and cyberbullying. Based on the theoretical framework and previous empirical findings, seven hypotheses are proposed:

H_1: self-control is negatively associated with cyberbullying;

H_2: parental monitoring is negatively associated with cyberbullying;
H_3: problematic internet use is positively associated with cyberbullying;
H_4: self-control is negatively associated with problematic internet use;
H_5: parental monitoring is negatively associated with problematic internet use;
H_6: problematic internet use mediates the relationship between self-control and cyberbullying; and
H_7: problematic internet use mediates the relationship between parental monitoring and cyberbullying.

Methods

Participants

The study received ethical approval from the Ethics Committee of the Faculty of Psychology, Universitas 17 Agustus 1945 Surabaya, under approval letter No. 2500.1/K/F.Psi/VIII/2025. Participation was voluntary, and informed consent was obtained from all participants before data collection. Convenience sampling was employed, with participants recruited based on their accessibility, availability, and willingness to participate during data collection, conducted through a classroom-based survey coordinated with schools. Additional online recruitment was performed using a survey link distributed via school networks and students' communication platforms. The inclusion criteria were: 1) being an active secondary school student (SMA, MA or SMK); 2) aged between 14 and 23; and 3) willing to participate voluntarily. Participants with incomplete questionnaire responses were excluded from the final analysis.

The demographic characteristics of the participants are presented in Table 1. A total of 2,517 Indonesian adolescents participated, consisting predominantly of female students (76.1%). They had a mean age of 16.40 years (SD = 1.08), ranging from 14 to 23 years old. Most participants lived in rural areas (63.7%) and were enrolled in senior high schools (63.4%). In terms of grade level, the majority were in Grade 12 (42.0%). Additionally, most reported living with both biological parents (86.1%).

Table 1

Demographic Characteristics of the Participants (N = 2.517)

Demographic	N	%
Sex		
Male	602	23.9
Female	1.915	76.1
Age (M = 16.40, SD = 1.08, Range 14 – 23 years old)		
Domicile		
Rural area	1.604	63.7
Small city	463	18.4
Large city	450	17.9
Grade		
Grade 10	587	23.3
Grade 11	873	34.7
Grade 12	1.057	42.0

The study included 2,517 secondary school students, with a mean age of 16.40 years (SD = 1.08; range = 14–23). The sample was predominantly female (76.1%), while male participants comprised 23.9%. As the sample was predominantly female (76.1%), this may limit the generalizability of the findings and should be considered when interpreting the results.

In terms of residential background, the majority of respondents lived in rural areas (63.7%), followed by those residing in small cities (18.4%) and large urban areas (17.9%), indicating that the sample was largely drawn from non-urban settings. This distribution suggests meaningful representation of adolescents from diverse geographical contexts.

Regarding educational characteristics, most participants were enrolled in general senior high schools (SMA; 63.4%), while others attended Islamic senior high schools (MA; 19.2%) and vocational high schools (SMK; 17.4%). Students were distributed across grade levels, with 23.3% in Grade 10, 34.7% in Grade 11, and the largest proportion in Grade 12 (42.0%), indicating a slightly higher representation of students in the final year of schooling.

Overall, the sample reflects a large and demographically diverse group of adolescents in terms of gender, residential background, and educational context, thereby providing a robust basis for examining the psychosocial and behavioral factors associated with cyberbullying.

Instruments

All instruments used in this study were adapted following the standardized guidelines proposed by Beaton et al. (2000) for cross-cultural adaptation of self-report measures, which include forward translation, back-translation, expert review, and pre-testing to ensure linguistic equivalence, conceptual relevance, and cultural appropriateness.

Cyberbullying

Cyberbullying behavior was assessed using the cyberbullying perpetration subscale of the European Cyberbullying Intervention Project Questionnaire (ECIPQ) developed by Brighi et al. (2018). The Indonesian version of the instrument, previously adapted and utilized in large-scale studies involving Indonesian adolescents (Bukhori et al., 2024), was employed. The scale comprises seven items measuring the frequency of cyberbullying behaviors (e.g., sending offensive messages or humiliating others online) over the past six months. Responses were recorded on a 5-point Likert scale ranging from 1 (never) to 5 (more than once a week), with higher scores indicating greater involvement in cyberbullying activities. The confirmatory factor analysis (CFA) results indicate that all items loaded significantly on a single latent cyberbullying factor ($p < .001$). The standardized factor loadings ranged from .378 to .547, indicating that the items contributed to the construct at low to moderate levels. Although several indicators demonstrated relatively modest loadings, all items remained statistically significant and were retained in the model.

The measurement model demonstrated an acceptable fit to the data, with CFI = .951, TLI = .921, SRMR = .028, and RMSEA = .056 (90% CI [.047, .066]). These figures suggest that the unidimensional structure of the cyberbullying scale adequately represented the observed data according to commonly recommended fit criteria. Post-hoc modification indices indicated several potential residual correlations among items. Based on theoretical and empirical considerations, only the residual covariance between Item 1 and Item 2 was added to the final model to improve model fit, suggesting possible overlap in item wording or similarity in behavioral content between the two indicators.

Reliability analysis showed moderate internal consistency, with Cronbach's $\alpha = .645$ and

McDonald's ω = .675. The composite reliability value was marginally acceptable (CR = .66). However, the average variance extracted (AVE = .22) was below the recommended threshold, indicating limited convergent validity of the construct. Nevertheless, all indicators loaded significantly on the latent factor. Overall, the findings provide preliminary support for the adequacy of the cyberbullying scale in measuring adolescents' cyberbullying behavior, although several items may benefit from further refinement in future studies.

Problematic Internet Use

PIU was measured using a five-item scale adapted from the NCT Engagement component of the Lodz Electronic Aggression Prevalence Questionnaire (Pyżalski, 2012) as utilized within the European Cyberbullying Intervention Project (ECIP) framework (Genta et al., 2012). As no officially validated Indonesian version of this instrument is currently available, the researchers translated and carefully adapted the items to ensure linguistic clarity, cultural relevance, and conceptual consistency. Responses were collected using a Likert-type scale, with higher scores indicating greater levels of PIU. CFA was conducted to assess the scale's measurement structure. The results supported a unidimensional model, with all five items loading significantly onto a single latent PIU factor ($p < .001$). The standardized factor loadings ranged from .307 to .599, indicating that each item contributed to the construct at a low to moderate level. The overall model fit indices suggested an acceptable fit to the data, with CFI = .961 and TLI = .923, exceeding commonly recommended thresholds. In addition, SRMR = .023 and RMSEA = .054 (90% CI [.040, .070]) indicated a reasonable approximation of the model to the observed data.

Regarding reliability, the scale demonstrated modest internal consistency, with Cronbach's α = .569 and McDonald's ω = .576. For the problematic internet use scale, all factor loadings were statistically significant ($p < .001$), with standardized loadings ranging from .307 to .599. The composite reliability value was marginally acceptable (CR = .68), while the AVE value was relatively low (AVE = .23), indicating limited convergent validity. Although the indicators represented the latent construct significantly, the relatively low AVE suggests that the scale may only capture the construct with moderate precision.

Self-control

Self-control was assessed using the Brief Self-Control Scale (BSCS) developed by Tangney et al. (2004). The Indonesian adaptation of the scale, previously validated for use among adolescents (Arifin & Milla, 2020), conceptualizes self-control as a multidimensional construct consisting of two underlying components: inhibitory control and behavioral initiation. The instrument includes ten items, six reflecting inhibition and four representing initiation, rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The CFA results indicate that all retained items loaded significantly on a single latent self-control factor ($p < .001$). The standardized factor loadings ranged from .613 to .713, indicating moderate to strong contributions of the indicators to representing the self-control construct. The findings suggest that the retained items adequately reflected the underlying latent factor.

The measurement model demonstrated an acceptable fit to the data, with CFI = .958, TLI = .937, SRMR = .030, and RMSEA = .081 (90% CI [.073, .090]). Although the RMSEA value slightly exceeded the preferred cutoff, the overall fit indices suggested that the unidimensional model provided a reasonably adequate representation of the observed data.

Reliability analysis showed good internal consistency, with Cronbach's α = .841 and

McDonald's ω = .841. In addition, the scale demonstrated strong composite reliability (CR = .84) and acceptable convergent validity, as indicated by the average variance extracted (AVE = .43). Although the AVE value was slightly below the recommended threshold of .50, the relatively high factor loadings and reliability coefficients suggest that the self-control scale possessed satisfactory psychometric properties overall. Therefore, the scale was considered appropriate for assessing adolescents' self-control in this study.

Parental Monitoring

Parental monitoring was measured using a five-item instrument adapted from commonly used indicators of parental supervision of adolescents' online activities within the European Cyberbullying Intervention Project (ECIP) framework (Genta et al., 2012). In the absence of an established Indonesian version, the researchers translated and contextually adjusted the items to ensure linguistic accuracy and cultural relevance. The participants rated each item on a Likert-type scale, with higher scores reflecting greater perceived parental monitoring.

To evaluate construct validity, CFA was conducted. The results supported a single-factor structure, with all five items loading significantly onto the latent parental monitoring construct ($p < .001$). The standardized factor loadings ranged from .512 to .811, indicating moderate to strong contributions of the items to representing the underlying construct. The overall model fit indices suggested an acceptable, though not optimal, fit to the data, with CFI = .985 and TLI = .970, indicating good comparative fit, while SRMR = .023 and RMSEA = .077 (90% CI [.063, .093]) pointed to a reasonable level of approximation, despite RMSEA slightly exceeding the preferred cutoff. In terms of reliability, the scale demonstrated strong internal consistency, with Cronbach's α = .839 and McDonald's ω = .846. The parental monitoring scale demonstrated good psychometric properties, while the CFA results showed that all items loaded significantly on the latent factor ($p < .001$), with standardized loadings ranging from .512 to .811. The scale achieved high composite reliability (CR = .86), indicating strong internal consistency, and satisfactory convergent validity, as reflected by the AVE value (AVE = .53). The findings suggest that the parental monitoring scale possessed adequate construct validity and reliability. The values indicate that the instrument provides a reliable measurement of parental monitoring and is appropriate for use in latent variable analyses. Overall, the findings support the parental monitoring scale as a unidimensional construct with solid psychometric properties, suitable for inclusion in subsequent statistical modeling.

Statistical Analysis

To examine the relationships between self-control, parental monitoring, problematic Internet use, and cyberbullying behavior, a path analytic framework was employed that enabled the simultaneous estimation of both direct and indirect effects. Each construct was modeled as a latent variable to account for measurement error and obtain more accurate parameter estimates (Kline, 2023). Before structural model testing, separate CFAs were conducted to evaluate the adequacy of the measurement models.

Model estimation was performed using robust maximum likelihood (MLM) to address potential non-normality in the data by generating robust standard errors and adjusted fit statistics. In line with current structural equation modeling recommendations, the interpretation of the model focused primarily on the magnitude, direction, and statistical significance of parameter estimates in testing the proposed theoretical relationships, rather than relying exclusively on goodness-of-fit indices. Model fit indices were therefore used as complementary information to support the adequacy of the overall model.

The hypothesized relationships were evaluated using standardized path coefficients. Indirect effects were examined to assess the mediating role of PIU. Although mediation effects were tested using robust standard errors, future studies are encouraged to apply bootstrapping procedures to obtain more robust confidence intervals for indirect effect estimation. Statistical significance was determined using p-values below .05. All analyses were conducted using Jamovi (The Jamovi Project, 2025).

Results

Path Analysis

Path analysis was conducted to examine the direct and indirect relationships between self-control, parental monitoring, PIU, and cyberbullying behavior. The structural model demonstrated an excellent fit to the data, with all fit indices reaching their optimal values (CFI = 1.000, TLI = 1.000, GFI = 1.000, RMSEA = .000, SRMR = .000). This pattern reflects the just-identified nature of the model, in which the specified parameters are sufficient to reproduce the observed covariance matrix perfectly. Therefore, global fit indices in this context primarily indicate model identification rather than substantive model superiority. Consequently, interpretation focused on the magnitude, direction, and significance of the structural path coefficients and indirect effects.

In addition, demographic covariates including gender, age, education, and residential background (urban/rural) were controlled for in the analysis to reduce potential confounding effects. The findings are summarized in Table 2 and illustrated in Figure 1.

Hypothesis 1: Self-control and cyberbullying

Hypothesis 1 (H_1) proposes that self-control is negatively associated with cyberbullying behavior. The results support the hypothesis, indicating that self-control has a significant negative effect ($\beta = -.178$, $p < .001$). This finding suggests that adolescents with higher levels of self-control are less likely to engage in cyberbullying behavior. Although the effect size can be considered small to moderate, the finding remains meaningful in practical terms because self-control represents an individual protective factor that may reduce maladaptive online behavior across various contexts.

Table 2

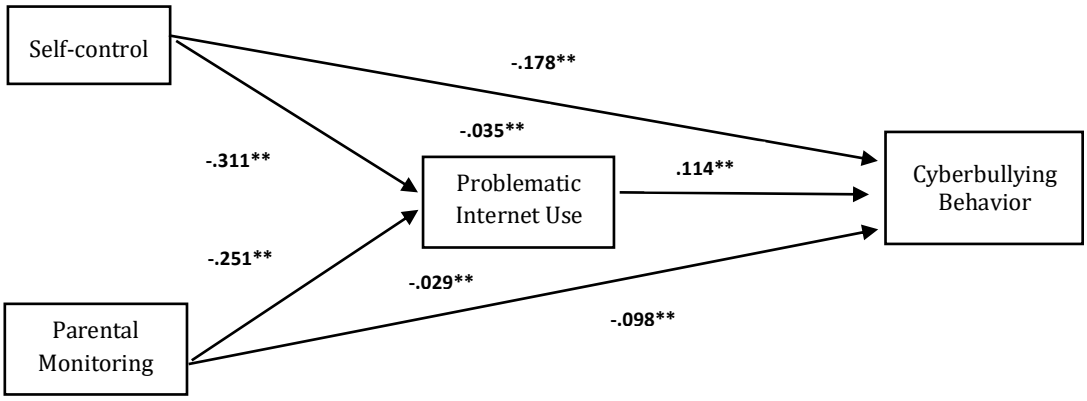
Standardized Path Coefficients and Indirect Effects

Effect	*β*	p-value
Direct		
Self-control → PIU	-.311	< .001
Parental Monitoring → PIU	-.251	< .001
PIU → Cyberbullying	.114	< .001
Self-control → Cyberbullying	-.178	< .001
Parental Monitoring → Cyberbullying	-.098	< .001
Indirect		
Self-control → PIU → Cyberbullying	-.035	< .001
Parental Monitoring → PIU → Cyberbullying	-.029	< .001

Note: Standardized coefficients (β) are reported; PIU = problematic internet use; indirect effects were tested using robust standard errors; $p < .05$ indicates statistical significance.

Figure 1

A Structural Path Model Illustrating the Direct and Indirect Relationships between Self-control, Parental Monitoring, Problematic Internet Use, and Cyberbullying Behavior



Hypothesis 2: Parental monitoring and cyberbullying

Hypothesis 2 (H_2) examines the direct relationship between parental monitoring and cyberbullying behavior. The findings support the hypothesis, showing that parental monitoring is significantly and negatively related to cyberbullying ($\beta = -.098$, $p < .001$). Although statistically significant, the magnitude of the effect is relatively small, indicating that parental monitoring alone may have a limited direct influence on reducing cyberbullying behavior. Nevertheless, it may still play an important preventive role when combined with other protective factors, such as self-control or healthy digital habits.

Hypothesis 3: Problematic internet use and cyberbullying

Hypothesis 3 (H_3) proposes that PIU is positively associated with cyberbullying behavior. The results confirm the hypothesis, revealing a significant positive effect of PIU ($\beta = .114$, $p < .001$). Although the effect size is modest, the finding indicates that adolescents who experience higher levels of PIU are more likely to engage in cyberbullying. From a practical perspective, this suggests that problematic patterns of online engagement may function as a behavioral risk factor for negative online interactions.

Hypothesis 4: Self-control and problematic internet use

Hypothesis 4 (H_4) tests whether self-control is associated with PIU. The analysis shows that it is significantly and negatively related to PIU ($\beta = -.311$, $p < .001$), thus supporting the hypothesis. Compared with other paths in the model, this relationship demonstrates a relatively stronger effect, suggesting that self-control is an important protective factor against excessive or maladaptive internet use among adolescents.

Hypothesis 5: Parental monitoring and problematic internet Use

Hypothesis 5 (H_5) examines the relationship between parental monitoring and PIU. The results support the hypothesis, demonstrating that parental monitoring is significantly and negatively associated with PIU ($\beta = -.251$, $p < .001$). The effect size indicates that it contributes meaningfully to reducing PIU, although the association is smaller than the effect of self-control.

Hypothesis 6: Problematic internet use mediates the relationship between self-control and cyberbullying

Hypothesis 6 (H_6) proposes that PIU mediates the relationship between self-control and cyberbullying. The findings also support the hypothesis, as the indirect effect of self-control on cyberbullying through PIU is significant ($\beta = -.035$, $p < .001$). Because the direct effect remains significant, the mediation pattern can be classified as complementary partial mediation. However, the relatively small indirect effect suggests that PIU explains only part of the relationship between self-control and cyberbullying, indicating that additional mediating mechanisms may also be involved.

Hypothesis 7: Problematic internet use mediates the relationship between parental monitoring and cyberbullying

Hypothesis 7 (H_7) examines whether PIU mediates the relationship between parental monitoring and cyberbullying. The results support this hypothesis, with a significant indirect effect observed ($\beta = -.029$, $p < .001$). Since the direct effect also remained significant, the mediation can likewise be characterized as complementary partial mediation. Nevertheless, the indirect effect size was relatively small, suggesting that PIU accounts for only a limited proportion of the association between parental monitoring and cyberbullying.

Discussion

Research on cyberbullying has often focused on examining individual predictors in isolation. However, studies that simultaneously investigate the roles of self-control, parental monitoring, and PIU remain limited. Moreover, previous research has frequently conceptualized self-control as a mediating variable, emphasizing its role in regulating impulses and emotional responses associated with cyberbullying behavior (Vazsonyi et al., 2012; Peker & Yildiz, 2021; Sun et al., 2022). In contrast, fewer studies have examined PIU as a potential explanatory mechanism linking both individual factors (self-control) and environmental factors (parental monitoring) with cyberbullying behavior. Given that self-control, parental monitoring, and PIU have consistently been identified as correlates of adolescent cyberbullying (Bukhori et al., 2024), this study has aimed to integrate these variables within a single comprehensive model.

The findings support all the proposed hypotheses. First, self-control was negatively associated with cyberbullying behavior, indicating that adolescents with higher levels of self-control tended to report lower involvement in cyberbullying. This finding reinforces previous studies suggesting that adolescents who are better able to regulate their impulses, emotions, and behavioral responses are less likely to engage in aggressive online interaction (Stults & You, 2022; Bukhori et al., 2024). However, the findings should be interpreted as associative rather than causal because the cross-sectional design does not permit conclusions regarding temporal directionality. Therefore, while self-control appears to function as a protective factor, it cannot be definitively concluded that a higher level directly leads to lower cyberbullying behavior.

Second, parental monitoring was negatively associated with cyberbullying behavior. Adolescents who perceived higher levels of parental supervision and involvement in their online activities tended to report lower engagement in cyberbullying. This finding supports previous literature emphasizing the protective role of parental monitoring in reducing online risk behaviors (Stewart et al., 2022). Nevertheless, the practical magnitude of the relationship was relatively modest ($\beta = -.098$), suggesting that parental monitoring alone may not be sufficient to

reduce cyberbullying behavior significantly. Instead, it may operate alongside other individual, peer- and school-related factors, which collectively influence adolescents' online conduct.

Third, PIU was positively associated with cyberbullying behavior. Adolescents who reported more excessive or maladaptive internet use also tended to report higher involvement in cyberbullying. Although statistically significant, the effect size was relatively small (β = .114), indicating that PIU contributes only modestly to explaining cyberbullying behavior. Therefore, cyberbullying should be understood as a multifactorial phenomenon influenced not only by problematic internet engagement but also by broader psychosocial, emotional, and contextual factors. Excessive online engagement may increase adolescents' exposure to online conflict, impulsive communication, and negative peer interactions, thereby increasing the likelihood of cyberbullying involvement.

Fourth, self-control was negatively associated with PIU. Adolescents with stronger self-regulatory abilities were less likely to develop maladaptive internet use patterns. This finding aligns with theories suggesting that self-control functions as an important internal regulatory resource in managing digital behavior and resisting excessive online engagement.

Fifth, parental monitoring was negatively related to PIU, indicating that parental involvement and supervision may help adolescents maintain healthier internet use patterns. In the Indonesian context, this finding is particularly relevant because family relationships are often characterized by strong hierarchical structures and collectivistic values, in which parents play a central role in guiding adolescent behavior. Indonesian families commonly emphasize obedience, interpersonal harmony, and parental authority, which may strengthen the influence of parental monitoring on adolescents' digital activities.

At the same time, rapid technological development has created challenges for many parents who may have limited digital literacy compared with their children. Consequently, effective parental monitoring in contemporary Indonesian society may depend not only on supervision, but also on parents' ability to understand digital platforms, online risks and adolescents' patterns of internet use. This interpretation is further supported by recent evidence from Indonesia showing that family-related digital behavior is associated with adolescents' problematic technology use. Marini et al. (2025) found that parental phubbing, referring to a situation in which parents are physically present but psychologically absent because their attention is diverted to digital interactions, directly predicted higher problematic smartphone use among adolescents and indirectly influenced it through reduced parental attachment. Although parental phubbing differs conceptually from parental monitoring, both constructs highlight the importance of parent–adolescent interaction quality and family digital environments in shaping adolescents' maladaptive technology use.

The study also identified significant indirect associations involving PIU. Specifically, it statistically mediated the relationships between self-control and cyberbullying, and between parental monitoring and cyberbullying. However, because the data were cross-sectional, these mediation findings should not be interpreted as evidence of causal mechanisms or temporal processes. Instead, the mediation results indicate that PIU may represent a plausible explanatory pathway linking self-control and parental monitoring with cyberbullying behavior. Longitudinal or experimental studies are necessary to confirm whether PIU temporally mediates these relationships over time.

Another important consideration concerns the Indonesian sociocultural and geographical

context. Internet access and patterns of digital engagement may differ significantly between urban and rural adolescents. Urban adolescents generally experience greater internet accessibility, higher social media exposure, and more intensive digital interaction, which may increase opportunities for PIU and cyberbullying involvement. In contrast, those in rural areas may encounter different forms of online interaction shaped by limited connectivity, stronger community surveillance, and more traditional family structures. These contextual differences may partially explain variations in cyberbullying behavior and highlight the importance of considering sociocultural environments in future research and intervention programs.

The study contributes to the literature by integrating individual factors (self-control), environmental factors (parental monitoring), and behavioral factors (problematic internet use) within a single framework. The findings extend previous cyberbullying research by positioning PIU not merely as a correlate of cyberbullying, but as a potential explanatory behavioral pathway connecting self-regulation and family-related processes with online aggression. At the theoretical level, the findings support ecological perspectives suggesting that adolescent cyberbullying behavior emerges through the interaction of personal characteristics, family influences, and digital behavioral patterns.

The practical implications of the study are also important. First, schools could implement cyber wellness programs that promote responsible digital behavior, emotional regulation, and healthy online communication. Such programs could include classroom discussions, peer-support initiatives and digital citizenship education integrated into the school curriculum.

Second, interventions aimed at strengthening adolescents' self-control (such as emotional regulation training, mindfulness-based activities and problem-solving exercises) may help reduce maladaptive online behavior.

Third, parents may benefit from digital literacy programs that enhance their understanding of social media platforms, online risks and effective nonintrusive monitoring strategies. Supporting these recommendations, Fahrizal et al. (2024) show that parental management of children's gadget use may involve establishing clear rules, limiting internet access, regulating screen time, and redirecting children toward physical or outdoor activities. Although their study focused on preschool children, their findings suggest that family-based digital regulation can be introduced early and may provide a useful foundation for parent-focused interventions aimed at promoting healthier technology use during adolescence. In the Indonesian context, parental guidance may be particularly effective when it combines supervision with supportive communication and trust-building. Finally, collaboration between schools, families, and communities is necessary to develop comprehensive prevention strategies that address cyberbullying not only as an individual issue but also as a broader social and digital well-being concern.

Despite its contributions, the study has several limitations. First, the cross-sectional design prevents causal interpretation of the observed relationships and limits understanding of temporal dynamics among the variables. Future longitudinal studies are needed to clarify the directionality of these associations. Second, all variables were measured using self-report instruments, which may increase the risk of social desirability bias, recall bias, and common method bias. Adolescents may underreport socially undesirable behaviors such as cyberbullying or PIU. Third, the reliability of the PIU and cyberbullying measures was relatively modest. In addition, although the instruments demonstrated acceptable psychometric properties, potential

limitations related to construct representation and measurement accuracy should be considered when interpreting the findings. Modest reliability may attenuate the observed associations between variables. At the same time, limitations in construct validity may reduce the extent to which the instruments fully capture adolescents' experiences of PIU and cyberbullying behavior. Consequently, the findings should be interpreted with caution, and their generalizability to broader adolescent populations may be somewhat limited. Future studies are encouraged to employ measurement instruments with stronger psychometric properties and to incorporate multi-method assessments to improve validity and reliability. Fourth, the sample composition showed a gender imbalance, potentially limiting the generalizability of the findings across male and female adolescents. Fifth, although the sample was geographically diverse, the study did not comprehensively examine differences across urban and rural contexts or other sociocultural variations within Indonesia. Future research should therefore adopt more balanced sampling procedures, longitudinal designs, and multi-informant approaches to provide a more comprehensive understanding of cyberbullying among adolescents.

Overall, the findings suggest that self-control, parental monitoring, and PIU are meaningfully associated with adolescent cyberbullying behavior. Rather than indicating definitive causal pathways, the study highlights how individual self-regulation, family involvement, and digital behavioral patterns may collectively contribute to adolescents' online interactions. The findings provide an important foundation for future longitudinal and intervention-based research aimed at developing culturally relevant strategies to promote safer and healthier digital behavior among Indonesian adolescents.

Conclusion

The study underscores the important roles of self-control, parental monitoring, and problematic internet use in understanding cyberbullying among adolescents. The findings indicate that PIU is significantly associated with the relationship between lower self-control, weaker parental monitoring, and higher involvement in cyber-bullying. The results suggest that adolescents with poorer self-regulation and limited parental supervision tend to be more vulnerable to mal-adaptive online behaviors, which are in turn associated with a greater likelihood of engaging in cyberbullying. Therefore, prevention efforts may benefit from adopting a comprehensive approach that strengthens self-control, enhances parental monitoring, and addresses PIU as an important component of intervention strategies.[]

Author Contribution Statement

Andik Matulessy: Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Project Administration; Resources; Validation; Visualization; Writing Original Draft; Writing, Review & Editing. **Nurussakinah Daulay:** Conceptualization; Investigation; Methodology; Project Administration; Resources; Validation; Writing Original Draft; Writing, Review & Editing; Supervision. **Prakash Padakannaya:** Conceptualization; Resources; Validation; Writing, Review & Editing; Supervision. **Mamang Efendy:** Conceptualization; Resources; Validation; Writing, Review & Editing; Supervision. **Muhammad Irfan Nazieh:** Resources; Validation; Writing, Review & Editing.

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