



Loneliness, problematic internet use and the mental health of college students: The mediating role of family resilience and moderating role of resilient coping

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Abstract: Mental health crises among college students are on the rise, characterized by high levels of depression, anxiety and stress. This study aims to examine the influence of loneliness and problematic internet use (PIU) on students' mental health by understanding the role of family resilience as a mediator and resilient coping as a moderator. The research participants consisted of 666 students in Jakarta, Indonesia, selected through convenience sampling. Data were collected through use of the Loneliness Scale, Problematic Internet Use Scale, Family Resilience Scale, Resilient Coping Scale and Mental Health Scale. The analysis was based on the moderation regression model, using the Hayes test to assess the correlation between the variables, and the mediating effects of family resilience and the moderating role of resilient coping. The results show that loneliness ($b = -.522, p < .01$) and PIU ($b = -.351, p < .01$) had a significant negative effect on mental health. Family resilience mediated the relationship between loneliness and mental health, while loneliness reduced family resilience ($b = -.230, p < .01$) and family resilience improved mental health ($b = .414, p < .05$). Meanwhile, resilient coping had no direct effect on mental health ($b = -.147, p > .05$), but played a significant role as a moderator in the relationship between PIU and mental health ($b = .020, p < .05$). The findings emphasize the importance of interventions that strengthen family resilience and students' coping ability to maintain mental health amid increasingly complex social and digital pressures.

Keywords: college students; family resilience; loneliness; mental health; problematic internet use; resilient coping

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Introduction

College students, as a group undergoing a complex life transition, often encounter various psychological challenges, including depression, stress and anxiety. This phenomenon has led to an increased demand for mental health services at universities worldwide (Ellard et al., 2023).

College students are at high risk for experiencing mental health disorders, yet many do not seek professional help. The mental health of college students is closely tied to subjective well-being, which reflects how they perceive and evaluate their lives. Mentally healthy students are considered to be flourishing, experiencing positive emotions, and functioning optimally both psychologically and socially (Bruffaerts, 2026). In contrast, those experiencing an imbalance in mental health are seen as languishing, lacking positive emotions, and facing disruptions in their psychological and social functioning (Keyes, 2002).

This trend is evident in data that show a significant increase in the use of mental health services among college students. For instance, in the United States, the use of mental health care services, such as counselling and therapy, rose from 19% to 34% between 2007 and 2017. Similarly, in the United Kingdom, the proportion of students expressing concerns about their mental health increased from 0.4% in 2006 to 2% in 2016 (Ellard et al., 2023).

Bouchrika (2026) reported that more than 60% of students had experienced mental health disorders. The mental health of Indonesian students is reportedly worse than that of students in other countries, such as the UK (Kotera et al., 2024). A comparative study involving 156 Indonesian students and 145 UK students found that those from Indonesia demonstrated higher levels of depression, anxiety, stress, and family-related mental health shame compared to UK students (Kotera et al., 2024). Alarming, Indonesia recorded 826 cases of student suicides in 2022 (Sagita, 2023).

One of the key factors contributing to mental health disorders among college students is loneliness. It is not only an indicator of well-being, but it can also lead to the development of mental disorders if left unaddressed (Mushtaq et al., 2014). This feeling of loneliness often arises from a lack of close social relationships and significantly impacts a person's emotional well-being (Russell, 2014). Several studies have demonstrated that college students who experience loneliness are more vulnerable to anxiety, depression and even suicidal thoughts (Richardson et al., 2017).

Other research also indicates that 10.5% to 43.5% of college students across various countries report significant levels of loneliness (Weber et al., 2022). At the microsystem level, particularly within the family environment, a student's mental health is profoundly shaped by early interactions and the support received. Ahmed and Saha (2021) and Rose et al. (2025) reported that social factors (family factors) significantly predict adolescents' mental health, highlighting the family as an important protective environment that may also support mental health among university students. Walsh (2016) defines family resilience as a family's ability to endure and recover after facing challenging situations. Those with healthy communication systems and the ability to offer emotional support play a vital role in mitigating the negative impact of loneliness on students' mental health (Gong et al., 2024).

According to the discrepancy model of loneliness based on Perlman and Peplau (1984), the loneliness experienced by students results from their perception of the external environment, or from a repressive culture. The family resilience experienced by students tends to be a predisposition to loneliness, while such loneliness affects the way they respond to social situations and in the long run can negatively impact mental health (Richardson et al., 2017).

In this correlation, family resilience acts as a mediator that weakens the negative impact of

loneliness on mental health. Support and adaptability in a resilient family can protect students from the psychological distress caused by loneliness. On the other hand, weak family resilience increases the risk of mental disorders in lonely students. Students' mental health problems are further exacerbated by the phenomenon of problematic internet use (PIU), with the internet often used as an escape for students experiencing loneliness.

Boylu and Günay (2018) reported that age, duration of internet use, and level of loneliness were important predictors of internet addiction in college students. Research shows that excessive internet use can heighten feelings of loneliness, lead to sleep deprivation, and is associated with various psychopathological disorders (Cai et al., 2023; Stubbs et al., 2023).

In many cases, PIU does not yield positive health outcomes, but instead worsens students' psychological conditions (Kożybska et al., 2022). Researchers such as Barthakur and Sharma (2012) have found that students with PIU are more likely to feel isolated and depressed.

In addressing the psychological distress caused by loneliness and PIU, resilient coping plays a vital role as an effective strategy to manage stress and challenges (Kożybska et al., 2022; Li et al., 2023). Research conducted by Gong et al. (2024) shows that resilience skills training is effective in alleviating symptoms of depression and other psychological disorders among college students.

Almulla et al. (2025) found that the majority of university students exhibited low levels of resilience alongside high levels of internet addiction behavior. These findings indicate that low resilience increases vulnerability to stress and difficulty in coping with challenges. Consistent with these findings, Çiçek et al. (2026) demonstrated that resilience and meaning in life partially mediate the relationship between

loneliness and problematic social media use (PSMU), a form of problematic internet use (PIU). These findings are reinforced by Chen and Shi (2026), who stated that psychological resilience and hope serve as protective factors capable of mitigating the negative impact of internet addiction on students' mental health. This suggests that PIU is not merely a behavioral issue but is also linked to psychological vulnerability.

Despite the growing body of research on loneliness, problematic internet use (PIU) and mental health, several important gaps remain that warrant further investigation. Previous studies have consistently demonstrated that loneliness is a significant predictor of mental health problems. For example, Xie et al. (2025) found that loneliness significantly predicted depression among college students, with problematic internet use (PIU) acting as a mediating variable, and perceived social support functioning as a moderator. Their findings indicate that loneliness does not directly affect mental health alone, but operates through complex psychological and behavioral mechanisms.

Similarly, a longitudinal study by Fukuya et al. (2026) revealed that loneliness prospectively increased the risk of developing PIU among adolescents (RR = 1.14; 95% CI [1.05–1.24]), even after controlling for confounding variables such as depressive symptoms and baseline internet use. It suggests that loneliness plays a causal role in the emergence of maladaptive internet behaviors. At the student level, Maulida and Kusumaningrum (2023) found a significant positive correlation between loneliness and PIU ($r = .348$; $p < .005$), indicating that higher loneliness was associated with higher levels of problematic internet use among college students. The findings also highlight that loneliness contributes to compulsive internet use and negative outcomes such as reduced academic functioning. In addition, a literature review by Rahmi and Chairani (2025) emphasized that PIU is a multidimensional phenomenon

influenced not only by behavioral factors, but also by emotional dysregulation, low self-control and psychosocial distress, including loneliness.

Consistent with these findings, Safaria et al. (2024) demonstrated that emotional dysregulation and smartphone use significantly contributed to nomophobia among university students in Indonesia and Malaysia, highlighting the important role of emotional and behavioral factors in problematic digital technology use. It indicates that PIU is not merely a behavioral issue, but is deeply rooted in psychological vulnerabilities. However, several limitations remain.

First, most previous studies have examined loneliness, PIU and mental health in separate or only partially integrated models, without simultaneously testing the variables within a single comprehensive framework. Second, although mediation and moderation mechanisms have been explored, previous research typically uses only one protective variable, such as perceived social support, without distinguishing the different roles of external (family-based) and internal (individual coping) protective factors. Third, no study has simultaneously positioned family resilience as a mediating variable and resilient coping as a moderating variable within the same theoretical model, limiting the understanding of how protective mechanisms operate at different ecological levels. Fourth, most studies adopt a deficit-oriented perspective focusing on depression or psychological disorders, whereas the application of a positive mental health framework (flourishing–languishing) remains limited. Fifth, empirical evidence from Indonesian college students remains scarce, despite the high prevalence of mental health problems and increasing internet use in this population. Therefore, this study offers clear novelty by integrating loneliness and PIU as dual risk factors within a single comprehensive model.

In addition, the study positions family resilience as a mediating variable and resilient coping as a moderating variable, thereby distinguishing the roles of external and internal protective factors. Furthermore, the study applies a positive mental health framework (flourishing–languishing) to provide a more holistic understanding of students' well-being, while also contributing context-specific evidence from Indonesian college students. This population remains under-represented in the literature. This integrative approach not only advances theoretical understanding, but also offers practical implications for designing multilevel mental health interventions.

Based on these considerations, the study aims to examine the influence of loneliness, PIU and family resilience on students' mental health. It also analyzes the mediating role of family resilience in the relationship between loneliness and mental health, as well as the moderating role of resilient coping in the relationship between PIU and mental health. Through these objectives, the aim is to provide a more comprehensive understanding of the mechanisms underlying students' mental health by integrating both risk and protective factors. The following hypotheses are proposed:

- H₁: There is a significant influence of loneliness, PIU and family resilience on students' mental health.
- H₂: Family resilience acts as a significant mediator in the relationship between loneliness and students' mental health.
- H₃: Resilient coping acts as a significant moderator in the relationship between PIU and students' mental health.

Methods

Participants

This study involved 666 students from various universities in Jakarta, selected using convenience sampling.

Research Instruments

This study used several standardized scales to measure the variables under investigation, including the Mental Health Continuum-Short Form (MHC-SF), to assess students' psychological and social well-being. The scale consists of 14 items, with Cronbach's alpha = .886, and rxt ranging from .442 to .684.

UCLA Loneliness Scale - used to measure the level of subjective loneliness. The scale comprises 20 items, with Cronbach's alpha = .888, and rxt ranging from .273 to .691.

Generalized Problematic Internet Use Scale 2 (GPIUS 2) - used to measure the level of subjective internet use. The scale consists of 15 items, with Cronbach's alpha = .882 and rxt ranging from .348 to .663.

Brief Resilient Coping Scale (BRCS) - used to assess students' ability to cope with stress adaptively. It consists of four items, with a reliability of .732, the lowest rxt = .452, and the highest rxt = .583.

Family Resilience Scale Short Form - used to measure the level of family resilience in coping with stress or difficulties. It comprises 16 items, with a reliability of .840, the lowest rxt = .111 (valid = <.076) and the highest rxt = .696.

Research Design

A quantitative cross-sectional design was employed, allowing data collection at a single point in time to identify relationships between the variables under investigation.

Data Analysis Techniques

The collected data were analyzed using multiple regression analysis, which included both a mediation and a moderation model. The mediation model tested the role of family

resilience in the relationship between loneliness and mental health, while the moderation model examined the role of resilient coping in the relationship between PIU and mental health.

Results

The description of the research subject can be seen in Table 1 and Table 2. Table 3 shows an R^2 of .432 for mental health. It means that independent variables such as loneliness, problematic internet use, family resilience and resilient coping together influence students' mental health by 43.2%. The remaining 56.8% are influenced by other factors outside the research model. The R^2 for family resilience = .135 functions as a mediating variable in the relationship between loneliness and mental health. In the mediation analysis, family resilience was also treated as a dependent variable predicted by loneliness. This value shows that 13.5% of variability in family resilience can be explained by loneliness, while 86.5% is influenced by other factors.

Table 4 shows that loneliness has a significant direct influence on students' mental health. The estimated coefficient has a value of $b = -.522$, with $p < .001$ and a 95% confidence interval $[-.606, -.438]$. This indicates that the more loneliness students experience, the lower their mental health. Confidence intervals that do not cross zero reinforce the statistical significance of this influence. Furthermore, it was found that problematic internet use (PIU) had a significant negative effect on mental health, especially in students with low levels of resilient coping (-1 SD). The estimated pathway has a value of $b = -.109$, $p < .001$, and a 95% CI $[-.164, -.054]$, indicating that students with low coping skills were more prone to mental health disorders when using the internet problematically.

Table 1*Descriptive Analysis of the Research Data and Research Variable Categories*

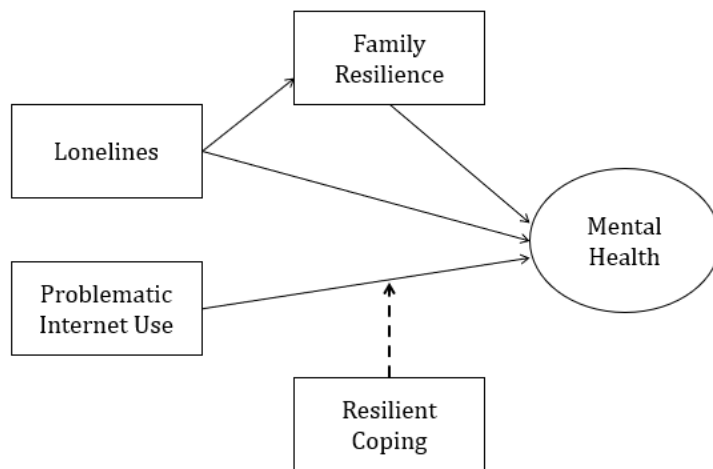
Variable Categories	Frequency	Percentage	Variable Categories	Frequency	Percentage
Sex			Problematic Internet Use		
Female	411	61.7	Low	120	18.0
Male	255	38.3	Middle	459	68.9
Mental Health			High	87	13.1
Low	15	2.3	Family Resilience		
Middle	225	33.8	Low	661	99.2
High	426	64.0	Middle	5	0.8
Loneliness			Resilient Coping		
Low	113	17.0	Low	263	39.5
Middle	475	71.3	Middle	306	45.9
High	78	11.7	High	97	14.6

Table 2*Standard Deviation of Research Variables*

Research Variables	Mean	Std. Deviation
Mental Health	56.40	12.014
Loneliness	48.58	9.388
Problematic Internet Use	65.10	17.595
Family Resilience	46.16	5.881
Resilient Coping	14.06	2.474
Mental Health		
Emotional Well-being	12.59	2.854
Social Well-being	18.42	5.275
Psychological Well-being	25.38	5.932
Loneliness		
Personality	12.70	2.442
Social Desirability	18.06	3.700
Depression	17.82	4.199
Problematic Internet Use		
Preference for Online Social Interaction	11.31	5.209
Mood Regulation	16.44	4.413
Cognitive Preoccupation	12.20	4.552
Compulsive Internet	13.55	4.840
Negative Outcome	11.60	4.613
Family Resilience		
Communication and Relatedness	22.36	3.675
Positive Framing	12.04	1.661
External Resource	11.76	1.916
Resilient Coping		
Adaptive Coping	3.32	.853
Confidence in Overcoming Problems	3.40	.811
Perseverance	3.72	.833
Ability to Recover	3.62	.826

Table 3*R-squared of Independent Variables to Dependent Variables*

	R ² Model 1
Mental Health	.432
Family Resilience	.135

Figure 1*Research Model***Table 4***Mediation Effects*

						95% Confidence Interval	
	Label	Estimate	Std. Error	z-value	p	Lower	Upper
Lonely → Mental Health	c1	-.522	.043	-12.163	<.001	-.606	-.438
Problematic Internet Use → Mental Health	(c2 + c4 * 12)	-.109	.028	-3.902	<.001	-.164	-.054
Problematic Internet Use → Mental Health	(c2 + c4 * 14)	-.069	.021	-3.199	.001	-.111	-.027
Problematic Internet Use → Mental Health	(c2 + c4 * 16)	-.028	.023	-1.234	.217	-.073	.017
Lonely → Family Resilience → Mental Health	a1 * b1	-.095	.017	-5.500	<.001	-.129	-.061

In students with moderate levels of resilient coping (i.e., at the mean score), the negative influence of PIU on mental health remained significant, with estimated coefficients of $b = -.069$, $p = .001$, and 95% CI $[-.111, -.027]$. It suggests that

even if individuals have moderate coping skills, PIU can still reduce mental health, although the impact is not as great as on individuals with low coping skills. Meanwhile, in students with a high level of resilient coping (+1SD), the negative

influence of PIU on mental health is insignificant. The estimated coefficient of $b = -.028$, with $p = .217$ and 95% CI $[-.073, .017]$ shows that this effect did not differ significantly from zero. Therefore, high resilient coping ability can act as a protector, reducing the negative impact of PIU on mental health. In addition, the mediation analysis showed that family resilience plays a significant role in the relationship between loneliness and mental health. The indirect pathway from loneliness to mental health through family resilience had $b = -.095$, $p < .001$, and a 95% CI of $[-.129, -.061]$. The results indicate that loneliness has an indirect negative impact on mental health by reducing family resilience. When someone feels more lonely, their family's ability to provide resilience and support tends to decrease. Conversely, family resilience has a significant positive effect on mental health. It means individuals with highly resilient families tend to have better mental health.

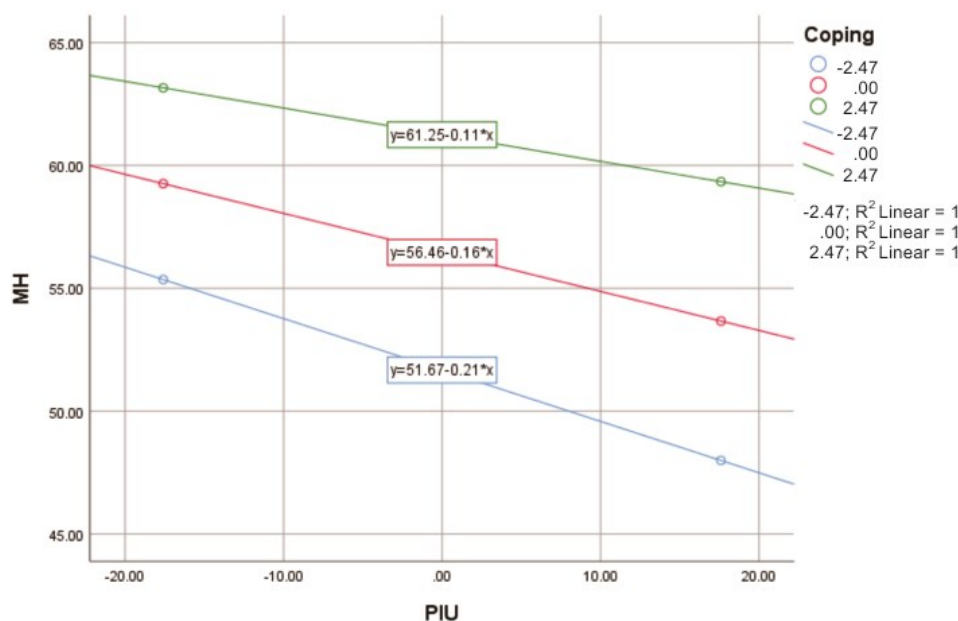
The mediation results show that family resilience mediates the influence of loneliness on

mental health ($b = -.095$, $p < .01$) and can significantly reduce loneliness's impact on mental health.

Figure 2 shows that, based on the moderation analysis, resilient coping plays a role in influencing the strength of the negative relationship between PIU and mental health. In the interaction graph, PIU is plotted on the X axis and mental health on the Y axis, with three lines representing resilient coping (RC) levels: low (-2.47), medium (.00) and high (+2.47). The results show that at all levels of resilient coping, the relationship between PIU and mental health was negative: the higher the PIU, the lower the level of mental health. However, the slope of the line differs depending on the degree of coping:

- Low RC (blue line, $b = -.21$): shows the sharpest decline in mental health as PIU increases. It means that students with low coping skills are particularly vulnerable to the negative impact of PIU.

Figure 2
Moderator Graphics



- b. Moderate RC (red line, $b = -.16$): indicates a moderate decrease in mental health as PIU increases. Individuals with average coping still experience a decline in mental health due to PIU, but not as strong as those with low coping.
- c. High RC (green line, $b = -.11$): indicates the most pronounced decline. It means that students with high coping skills are relatively protected from the negative impact of PIU on mental health.

Table 5 shows that loneliness has a significant negative influence on mental health, with a b coefficient of $-.522$ ($p < .001$, 95% CI $[-.606, -.438]$). These findings suggest that the higher the level of loneliness students experience, the lower their mental health conditions. Family resilience also had a significant positive influence on mental health, with $b = .414$ ($p < .001$, 95% CI $[.290, .539]$). It means students who feel supported and empowered by their families tend to have better mental health. PIU also showed a significant negative association with mental health, with an estimated b of $-.351$ ($p = .0007$, 95% CI $[-.554, -.147]$). It shows that students who use the internet

excessively or unhealthily are more prone to experiencing a decline in mental health. Nonetheless, resilient coping did not show a significant direct effect on mental health. The coefficient was $-.147$, with a p -value = $.756$ (95% CI $[-1.072, .779]$), indicating that resilient coping did not directly contribute to students' mental health in this model. However, significant results emerged from the interaction between PIU and resilient coping related to mental health. The interaction coefficient was $b = .020$ ($p = .004$, 95% CI $[.007, .034]$), suggesting that although coping did not directly affect mental health, resilient coping moderated the association between PIU and mental health. In other words, higher coping ability can reduce the negative impact of problematic internet use on students' psychological states. Finally, loneliness was also found to have a significant negative effect on family resilience, with $b = -.230$ ($p < .001$, 95% CI $[-.274, -.186]$). It suggests that college students who feel lonely tend to perceive low support and resilience from their families.

Table 5
Path Coefficients

						95% Confidence Interval	
	Label	Estimate	Std. Error	z-value	p	Lower	Upper
Lonely → Mental Health	c1	-.522	.043	-12.163	< .001	-.606	-.438
Family Resilience → Mental Health	b1	.414	.063	6.535	< .001	.290	.539
Problematic Internet Use → Mental Health	c2	-.351	.104	-3.378	< .001	-.554	-.147
Resilient Coping → Mental Health	c3	-.147	.472	-.310	.756	-1.072	.779
Problematic Internet Use : Resilient Coping → Mental Health	c4	.020	.007	2.905	< .004	.007	.034
Lonely → Family Resilience	a1	-.230	.023	-10.188	< .001	-.274	-.186

Discussion

Hypothesis 1: There is a significant influence of loneliness, PIU and family resilience on students' mental health is accepted.

The results of the hypothesis testing indicate that there is a significant influence of loneliness, PIU and family resilience on students' mental health. These three variables together explain 43.2% of the variance in students' mental health, while other factors outside the research model influence the remaining 56.8%. The findings suggest that higher levels of loneliness and PIU are associated with poorer mental health, as students who experience social isolation or partake in excessive internet use tend to have lower psychological well-being. In contrast, strong family resilience contributes positively to mental health. This relationship is further supported by Lin et al. (2024), who found that family support had a stronger influence than peer support in reducing problematic social media use by increasing resilience and decreasing loneliness. These findings suggest that family plays a key role in strengthening individual resilience, thus protecting mental health, including during the transition to early adulthood. The findings also confirm the important role of psychosocial factors in shaping students' mental health, in line with An et al. (2024), who highlighted the influence of family support on psychological well-being. Family has a significant impact on individual mental health. Conversely, Multahada et al. (2025) found that PIU increased adolescent loneliness through weak social support and family communication. These findings highlight the family's role in preventing and intervening in adolescent loneliness (Gong et al., 2024; Perlman & Peplau, 1984).

According to data from the Healthy Minds Study (Bouchrika, 2026; Richardson et al., 2017), around 25% of students often feel isolated, and

22% feel left out. If these feelings persist, loneliness can lead to depression, anxiety and other mental health problems. Loneliness among students is indeed a common problem, especially in the first year of college. It is often experienced by female students, those with low economic status, smokers, or those living in dormitories. Research by Eisenberg et al. (2022) showed that almost 15% of students surveyed in the Healthy Minds Study 2020–2022 reported that they had considered suicide. In line with this, Farida et al. (2025) stated that the risk of suicidal ideation in adolescents can be reduced by reducing loneliness and increasing resilience and social support.

In this study, loneliness was found to make a significant negative contribution of -52.2% to mental health. It indicates that the higher the level of loneliness experienced by students, the more their mental health declines. PIU also showed a significant negative influence of -35.1% on mental health. It's in line with the study by Kuss and Griffiths (Kuss & Griffiths, 2011, 2017), who showed that excessive internet use could increase feelings of loneliness and anxiety, which negatively impacts mental health. Wegmann et al. (2015) also reported that PIU contributed to increased social anxiety and psychological stress, which directly adversely affected the mental well-being of college students. From the descriptive data, it can be seen that most students (68.9%) are in the moderate internet use category, with 13.1% in the high category, which indicates the risk of mental disorders related to this behavior.

In contrast, family resilience contributed positively (41.4%) to students' mental health. Students who feel strong, communicative and able to cope with stress together tend to have better mental well-being. This result strengthens Walsh's family resilience theory (2016), which proposes that a resilient family is the main support system in overcoming stress and building psychological resilience. Multahada et al.'s research (2025) also

confirms that family support can reduce the risk of loneliness and improve students' mental health. However, the data show that most students (99.2%) have a low level of family resilience, signalling the need for more attention to the role of families in supporting mental health.

The student mental health descriptive data show that the majority (64%) are in the strong mental health category, 34% in the moderate, and only 2% in the low. These figures are similar to Hunt and Eisenberg (2010), who reported that most college students had good or stable mental health. However, attention must be paid to the high proportion of students who experience moderate to high loneliness (83%) and the small proportion with high PIU (13.1%). It shows that there is a considerable risk of mental health disorders, even though the proportion of students with low mental health is relatively small.

Hypothesis 2: Family resilience acts as a significant mediator in the relationship between loneliness and students' mental health is accepted.

Based on previous supporting studies, students' mental health is strongly influenced by psychological and social well-being, determined by loneliness, PIU, and family resilience. Furthermore, the analysis demonstrates that family resilience plays a significant mediating role in this relationship. Students who experience higher levels of loneliness tend to perceive lower levels of family resilience and support, which subsequently contributes to a decline in their mental health.

This finding highlights the crucial role of family resilience as a protective factor that can buffer loneliness's negative impact on psychological well-being. A resilient family provides emotional security, open communication, and adaptive coping strategies that help students manage feelings of isolation and distress. When family systems are strong and cohesive, students are more likely to feel supported, connected and emotionally stable, even in the face of loneliness.

Conversely, when family resilience is weak, loneliness can more easily lead to psychological difficulties such as stress, anxiety or depressive symptoms.

Overall, the results emphasize the importance of strengthening family resilience and support systems to enhance students' mental health and reduce the adverse effects of loneliness, particularly among young adults navigating academic and social challenges.

Mediation pathway analysis found that the indirect influence of loneliness on mental health through family resilience was significant, suggesting that family resilience reduced the negative impact of loneliness on students' mental health. It acts as an intermediate mechanism that explains in part the relationship between loneliness and mental health, rather than as a variable that strengthens or weakens those relationships. These findings align with the theory of family resilience developed by Walsh (2016), who proposed that the family, as a system, can support its members in the face of psychological stress, including loneliness, thereby helping maintain mental health. Family support through effective communication, empathy and cooperation in facing common problems plays an important role in building resilience, which can minimize the negative effects of loneliness.

Similar findings are also found in other research, such as Hutten et al. (2021), Reivich and Shatté (2002), and Ye et al. (2023), who found that strong family resilience can lower the risk of mental health disorders such as anxiety and depression

Furthermore, Kim et al. (2009) suggested that loneliness is not only a cause but also a consequence of Problematic Internet Use (PIU). College students experiencing loneliness tend to use the internet excessively to satisfy unmet psychosocial needs. However, this problematic internet use actually interferes with academic

activities and social relationships, thus reinforcing feelings of loneliness and forming a reciprocal cycle between loneliness and PIU. These findings align with Musetti et al. (2020), who reported that loneliness is a significant risk factor for PIU. Peer-related loneliness is directly associated with increased PIU, while parental loneliness influences PIU through reduced emotional closeness with parents. Conversely, Resnick et al. (1993) showed that caring, connected family relationships are important protective factors for adolescent health and well-being. These findings suggest that warm, supportive family relationships may protect college students from the negative effects of loneliness and support better mental health.

Hypothesis 3: Resilient coping acts as a significant moderator in the relationship between PIU and students' mental health is accepted.

The study findings reveal that the negative impact of PIU on students' mental health varies depending on the level of their resilient coping abilities. Those with higher levels can better manage stress and regulate their emotions, thereby minimizing the harmful effects of excessive internet use on psychological well-being. Conversely, those with lower coping abilities are more vulnerable to experiencing mental health problems such as stress, anxiety and depression.

Moreover, Matiz et al. (2024) found that loneliness indirectly increased the risk of problematic internet use (PIU) through dissociation. Similarly, Reissmann and Lange (2023) reported that loneliness was indirectly associated with pathological internet use through social compensation motives.

This finding is consistent with that of Singh et al. (2024), who reported that problematic internet use (PIU) is associated with increased psychological distress. Accordingly, higher levels of PIU are associated with a greater risk of mental health problems. These findings align with Lazarus and Folkman's (1984) theory, which posits that

adaptive coping can help individuals manage stress and life challenges effectively (see also Folkman & Moskowitz, 2000). Ryff (1989) also emphasized the importance of coping in maintaining psychological well-being and reducing the negative impact of risk factors such as loneliness and PIU. Therefore, good coping skills are an additional protective factor in maintaining students' mental health.

Consistent with this theoretical perspective, Almulla et al. (2025) emphasize the importance of resilience in addressing internet addiction behaviors and recommend interventions that strengthen resilience. These findings align with the results of the present study, which show that students with low coping abilities experience the sharpest decline in mental health as PIU increases. In contrast, students with moderate coping abilities experience a more moderate decline. Likewise, Fan et al. (2022) demonstrated that students with low self-control are more prone to feelings of rejection and loneliness, and face a higher risk of PIU. Conversely, students with strong self-control are better able to regulate their emotions and behaviors, thereby reducing the risk of PIU and its impact on mental health. Thus, the findings support Hypothesis 3, indicating that robust coping ability acts as a moderator that mitigates the negative impact of PIU on students' mental health. Yam et al. (2024) also demonstrated that resilience exerts a buffering effect on the relationship between loneliness and social media addiction. These findings support the results of the present study, indicating that robust coping skills serve as a protective factor that mitigates the negative impact of PIU on university students' mental health.

Further evidence comes from Sayeed et al. (2021) found that 44% of students exhibited symptoms of PIU, indicating that it was a significant issue among students in Bangladesh. Their study also highlighted that PIU was closely

associated with depressive symptoms, unhealthy internet behavior patterns, and psychosocial problems such as relationship difficulties. Similarly, Sánchez-Fernández et al. (2023) emphasized that PIU has become a growing public health concern, particularly among college students. In line with Chen and Shi (2026), PIU is thought to deplete an individual's psychological resources, particularly their ability to regulate emotions and cope with stress. Reduced psychological resilience can then lead to lower hope, ultimately increasing vulnerability to various mental health problems.

In line with these studies, these findings underscore the importance of developing coping resilience among students as a protective factor against the detrimental psychological consequences of PIU. The results indicate that the moderation analysis showed that the negative correlation between PIU and mental health remained at all levels of resilient coping, but that the rate of decline in mental health due to PIU varied. Students with low resilient coping experienced the sharpest decline in mental health as PIU increased, while those with resilient coping experienced moderate declines, and those with high coping abilities showed the most pronounced decline in mental health. These findings indicate that high resilient coping ability can reduce the negative impact of problematic internet use on students' mental health.

Although resilient coping did not directly affect mental health in this model, the interaction between PIU and resilient coping showed its important role as a moderator. In other words, resilient coping does not directly improve mental health, but serves to protect students from the negative effects of PIU.

These findings are consistent with previous research. Gloria and Steinhardt (2016) and Li et al. (2023) affirm that resilient coping strategies can reduce the impact of stress and the risk of

psychological disorders triggered by external factors such as PIU. Kutuk (2023) also found that psychological resilience played a mediating role in the relationship between internet addiction and anxiety, highlighting the important role of mental resilience in coping with psychological distress due to PIU.

In theoretical terms, the buffering effect concept explains that good coping ability can protect against the stress impacts of external risk factors. The results of this study reinforce this idea by showing that students who have resilient coping skills can withstand the negative impact of PIU on their mental health. Zhuo et al. (2022) found that increased resilience can reduce internet addiction, offering insights for early detection and intervention, similarly, García-Pérez et al. (2025) important factor in maintaining college students' mental health. Students with higher levels of resilience tend to experience lower levels of stress, anxiety, and depression and have better psychological well-being, sleep quality, and academic engagement.

Therefore, resilient coping skills development interventions and programs are critical to help students manage the stress caused by PIU and protect their mental health. Increasing resilient coping can be an effective strategy for reducing the risk of psychological disorders that arise due to excessive or problematic internet use. In the research findings of Hidalgo-Fuentes et al. (2023), their meta-analysis shows that there is a significant negative relationship between resilience and problematic internet use. It means that the higher a person's level of resilience, the lower their tendency to experience PIU. These results are supported by data from nearly 94,000 participants and do not show publication bias, thus providing strong evidence of the relationship. Overall, the results support the hypothesis that resilient coping plays a significant moderator in the relationship between PIU and student mental health, and that

students with good coping skills can reduce the negative impact of PIU on their mental health.

The results align with Bronfenbrenner's ecological theory, which highlights the family environment's crucial role in shaping mental health, and with positive psychology theory, which underscores the importance of developing resilience and personal strengths to achieve mental health.

The findings highlight the vital role of family resilience and resilient coping in protecting students from the negative effects of loneliness and problematic internet use on mental health. Therefore, educational institutions and counselors could design family-based intervention programs to strengthen emotional support, positive communication, and family coping strategies. They could also provide resilient coping training as a protective factor and adaptive coping skills training through workshops, counseling sessions, or life-skills-based curricula, which are essential for helping students manage stress and digital pressures in healthy ways.

Furthermore, the results provide a foundation for universities and student counseling centers to develop promotive and preventive mental health policies, such as establishing digital counseling services, awareness campaigns on healthy internet use, and early detection programs for students experiencing loneliness or psychological difficulties.

Finally, mental health practitioners and counselors could use the findings to guide the design of psychological interventions that emphasize individual and family resilience as key components in maintaining students' mental balance in the digital era.

The study has several limitations to consider when interpreting the findings. First, it used a cross-sectional design, meaning data were collected at a single point in time, which does not allow strong causal conclusions between

variables. The relationships identified are therefore associative rather than causal. Second, the sampling technique used was accidental sampling, which may introduce bias and limit the generalizability of the findings to the broader student population. Third, all data were obtained through self-report questionnaires, which may be subject to respondent bias, such as social desirability bias or misunderstandings of the questionnaire items.

Fourth, although the research model integrated several important variables, such as loneliness, problematic internet use, family resilience, and resilient coping, it did not examine other relevant factors. For example, personality traits, peer social support, economic conditions and academic factors could all also influence students' mental health. Fifth, the data distribution indicates that most respondents reported low levels of family resilience, resulting in limited variability in this variable, which may have affected the robustness of the analysis.

Therefore, future research should use a longitudinal design, apply more representative sampling techniques, and include additional variables to gain a more comprehensive understanding of the factors influencing students' mental health.

Conclusion

The study has shown that students' mental health is significantly influenced by loneliness, problematic internet use and family resilience. Loneliness and excessive problematic internet use have a negative impact, while family support and resilience play a positive protective role. Although resilient coping skills did not directly affect mental health, they are an important moderator that help students manage the negative impact of PIU. Family resilience also plays a role as a mediator that reduces the adverse impact of loneliness on students' psychological well-being. The findings

emphasize the importance of systemic approaches, particularly the role of the family and the development of resilient coping skills, in the attempt to improve mental health in higher education settings. The results provide the basis

for interventions that emphasize strengthening of family support, interpersonal relationships, and managing the use of technology to prevent deterioration in students' mental health.[]

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Author Contribution Statement

Erna Multahada: Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Project Administration; Resources; Validation; Writing Original Draft; Writing, Review & Editing. **Nunung Khoiriyah:** Investigation; Project Administration; Resources; Supervision. **Prahastia Kurnia Putri:** Funding Acquisition; Resources; Writing, Review & Editing; Proofreading. **Fatma Nuraqmarina:** Funding Acquisition; Project Administration; Resources. **Dina Syakina:** Formal Analysis; Methodology; Validation; Visualization. **Ferdy Muzzamil:** Funding Acquisition; Resources; Visualization. **Arooj Arshad:** Writing, Review & Editing.

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