

Social Media Use, Cybersecurity Threats, and Psychological Distress: The Moderating Role of Social Support Among University Students

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ABSTRACT

Purpose of the study: This study examined the relationships of social media use and cybersecurity threats with depression, anxiety, and stress among university students in Manado, Indonesia. It also investigated whether perceived social support moderated the relationships between these digital stressors and the three dimensions of psychological distress.

Methodology: A quantitative cross-sectional design was employed with 300 university students in Manado, comprising 154 students from private universities and 146 from public universities. Participants were selected through random sampling. Data were collected using structured questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS.

Main Findings: Social media use was positively associated with depression ($\beta = 0.353$, $p < 0.001$), anxiety ($\beta = 0.305$, $p < 0.001$), and stress ($\beta = 0.353$, $p < 0.001$). Cybersecurity threats were positively associated with depression ($\beta = 0.144$, $p = 0.005$), but not with anxiety or stress. Social support was negatively associated with all three outcomes and moderated the relationships between social media use and depression and stress.

Novelty/Originality of this study: This study integrates social media use and cybersecurity threats within a single model while examining depression, anxiety, and stress as distinct psychological outcomes. The findings further demonstrate that the moderating role of social support is selective, occurring for depression and stress in relation to social media use but not for anxiety or cybersecurity-related pathways.

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1. INTRODUCTION

Social media has become an integral component of university students' everyday communication, information seeking, entertainment, and social interaction. Although digital platforms provide opportunities for connectivity and participation, problematic or intensive social media use has increasingly been associated with psychological difficulties. Recent systematic and longitudinal evidence indicates that problematic social media use is associated with adverse mental health outcomes among students [1], [2]. Similar findings have been

reported among university students, where problematic social media use has been linked to psychological distress and difficulties in well-being [3], [4].

The relationship between social media use and psychological well-being is nevertheless not uniform. A systematic review and meta-analysis has identified associations between social media addiction and anxiety, depression, fear of missing out, loneliness, and self-esteem among students [5]. Evidence concerning active and passive social media use also indicates that the psychological implications of social media engagement may differ according to how individuals interact with digital platforms [6]. Network-based evidence among university students has further demonstrated relationships between social media addiction and multiple psychological conditions, suggesting that digital engagement should be examined through differentiated psychological outcomes rather than as a single dimension of mental health [7]. Recent research has likewise indicated that social media sharing may be associated with psychological distress and student well-being through complex patterns of individual and social factors [8].

Alongside social media use, university students increasingly encounter cybersecurity-related risks in digital environments. These risks may involve privacy concerns, unauthorized access, data misuse, phishing, account compromise, and perceptions of digital vulnerability. Research on information privacy has demonstrated that individuals' concerns regarding the collection and use of personal information constitute an important dimension of digital behavior [9], [10]. Protection Motivation Theory provides a theoretical basis for understanding how individuals appraise threats and their capacity to cope with those threats [11]. Research on information-security behavior has also emphasized the human dimensions of cybersecurity awareness and protective behavior [12], [13]. Cybersecurity threats should, however, be distinguished from cyberbullying. Cyberbullying represents a specific form of interpersonal aggression in digital environments, whereas cybersecurity threats encompass broader concerns involving information security, privacy, unauthorized access, and digital vulnerability. Previous research has demonstrated associations between cyberbullying and adverse mental health outcomes among university students [14]. Such findings provide relevant contextual evidence regarding harmful digital experiences but should not be interpreted as direct evidence that all forms of cybersecurity threats produce the same psychological consequences.

Social support represents an important psychosocial resource in this context. Perceived social support encompasses support obtained from family, friends, and significant others and can be assessed using the Multidimensional Scale of Perceived Social Support [15]. Previous research has reported relationships between social support, problematic social media use, and depressive symptoms among university students [16]. Other evidence suggests that online social support may influence the relationship between Internet use and mental health outcomes [17]. However, the relationship between social support and problematic digital behavior is not necessarily uniform. Meta-analytic studies have found that online social support may itself be positively associated with problematic Internet use under particular circumstances [18], [19]. Therefore, the psychological function of social support requires consideration of its source, form, and relationship to specific digital behaviors. The present study focuses on depression, anxiety, and stress as three distinct dimensions of psychological distress. These outcomes are measured using the Depression Anxiety Stress Scales, which was developed to distinguish these related but conceptually different negative emotional states [20]. Treating the three outcomes separately is important because digital stressors may demonstrate different relationships with depression, anxiety, and stress. Evidence concerning social networking and subjective well-being likewise indicates that relationships between digital activity and psychological outcomes can vary across contexts and constructs [21].

Several gaps remain in the existing literature. First, social media use and cybersecurity threats are rarely examined simultaneously as distinct digital stressors within a single empirical model. Second, relatively limited attention has been given to whether perceived social support moderates the relationships between different digital stressors and separate dimensions of psychological distress. Third, studies of cybersecurity among university students have predominantly emphasized awareness, behavior, and lived experiences rather than psychological outcomes [13], [22]. Fourth, problematic social media use may be associated with functional deterioration among university students [23], but the extent to which social support changes these associations remains insufficiently understood. Accordingly, this study examines the relationships between social media use and cybersecurity threats and three dimensions of psychological distress—depression, anxiety, and stress—among university students in Manado. The study further examines whether perceived social support moderates these relationships. By distinguishing social media use from cybersecurity threats and examining depression, anxiety, and stress separately, the study seeks to provide a more differentiated understanding of digital stressors and the potential buffering role of social support.

2. RESEARCH METHOD

2.1 Research Design and Participants

This study employed a quantitative cross-sectional design. The research examined the relationships between social media use, cybersecurity threats, perceived social support, and three dimensions of psychological distress, namely depression, anxiety, and stress. The study involved 300 university students in Manado, Indonesia. The participants consisted of 154 students from private universities and 146 students from public universities. Participants were selected using random sampling.

2.2 Research Instruments

Four principal constructs were examined in this study. Social media use was measured using an adapted version of the Bergen Social Media Addiction Scale (BSMAS). The original BSMAS consists of six items assessing core dimensions of problematic social media use [24]. In this study, the instrument was adapted into 12 items to accommodate the research context. Cybersecurity threat experience was measured using a researcher-developed instrument consisting of 12 items covering four dimensions. The conceptual development of the instrument was informed by Protection Motivation Theory [11], information privacy concern [9], [10], and the Human Aspects of Information Security Questionnaire [12]. Research concerning cybersecurity experiences among university students also informed the contextualization of the construct [13], [22]. Psychological distress was measured using the Depression Anxiety Stress Scale-21 (DASS-21), developed by Lovibond and Lovibond [20]. The instrument consists of 21 items representing three dimensions: depression, anxiety, and stress. Perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS), developed by Zimet et al. [15]. The instrument consists of 12 items covering three sources of support: family, friends, and significant others.

2.3 Data Collection Procedure

Data were collected using a structured questionnaire administered to university students in Manado. The questionnaire was designed to obtain relevant information aligned with the research objectives. Participation in this study was entirely voluntary. Before completing the questionnaire, respondents were informed about the purpose of the research. They were also assured that all information provided would be treated confidentially and used solely for research purposes.

2.4 Data Analysis

PLS-SEM was employed to examine the direct relationships among the constructs and the moderating effects of perceived social support. PLS-SEM is appropriate for predictive models involving multiple latent constructs and interaction effects [25]-[27]. The structural model was evaluated using path coefficients and significance levels. Moderating effects were examined through interaction terms between social media use and perceived social support and between cybersecurity threats and perceived social support [28].

2.5 Ethical Considerations

Ethical approval for this study was obtained from Universitas Katolik De La Salle Manado. The study was approved under approval number 006050/KEP Unika De La Salle Manado/2026. The approval was issued on 23 July 2026. Participation in the study was entirely voluntary. All respondent information was treated confidentially and used solely for research purposes.

3. RESULTS AND DISCUSSION

3.1. Participant Characteristics

The study involved 300 university students in Manado. Of these participants, 154 students (51.3%) were enrolled at private universities, while 146 students (48.7%) were enrolled at public universities. The composition of the sample indicates a relatively balanced representation of students from private and public higher education institutions. This distribution provides a basis for examining digital experiences across students from different institutional contexts, although the present study does not conduct a comparative analysis between the two groups.

3.2. Direct Effects

The direct structural relationships are presented in Table 1.

Table 1. Direct Effects of Digital Stressors and Social Support on Psychological Distress

Relationship	B	P-Value	Result
Social Media Use → Depression	0.353	<0.001	Significant
Social Media Use → Anxiety	0.305	<0.001	Significant
Social Media Use → Stress	0.353	<0.001	Significant
Cybersecurity Threats → Depression	0.144	0.005	Significant
Cybersecurity Threats → Anxiety	—	>0.05	Not Significant
Cybersecurity Threats → Stress	—	>0.05	Not Significant
Social Support → Depression	-0.174	<0.001	Significant
Social Support → Anxiety	-0.150	0.010	Significant
Social Support → Stress	-0.215	<0.001	Significant

Social media use demonstrated positive and statistically significant relationships with all three psychological outcomes. The relationship with depression was $\beta = 0.353$ ($p < 0.001$), the relationship with anxiety was $\beta = 0.305$ ($p < 0.001$), and the relationship with stress was $\beta = 0.353$ ($p < 0.001$). These findings are broadly consistent with recent evidence documenting associations between problematic social media use and negative mental health outcomes among students [1], [2], [5]. Evidence from university populations similarly indicates relationships between social media use, stress, and psychological well-being [3], [4]. The consistency across depression, anxiety, and stress suggests that the observed association was not limited to a single dimension of psychological distress. Nevertheless, the findings should not be interpreted as evidence that social media use causes depression, anxiety, or stress. The cross-sectional design only permits examination of statistical associations. In addition, the literature indicates that the psychological implications of social media may vary according to the characteristics of digital engagement, including active and passive forms of use [6].

Cybersecurity threats showed a different pattern. The relationship between cybersecurity threats and depression was positive and statistically significant ($\beta = 0.144$; $p = 0.005$), whereas the relationships with anxiety and stress were not statistically significant. The finding concerning depression should be interpreted cautiously because the cybersecurity threat instrument was developed specifically for this study. Existing research among university students has predominantly examined cybersecurity awareness, behavior, lived experiences, and coping rather than directly testing psychological outcomes [13], [22]. The present result therefore provides an empirical basis for further examination and validation of the construct.

Perceived social support was negatively associated with depression ($\beta = -0.174$; $p < 0.001$), anxiety ($\beta = -0.150$; $p = 0.010$), and stress ($\beta = -0.215$; $p < 0.001$). These results indicate that students reporting higher perceived social support tended to report lower levels of psychological distress. This finding is consistent with research emphasizing the importance of social support for university students' mental health [29]. Previous research has also identified relationships between social support, problematic social media use, and depressive symptoms [16]. However, evidence concerning online social support indicates that the relationship between social support and problematic digital behavior may depend on the form and context of support [17]-[19].

3.3. Moderating Effects of Social Support

The moderating effects of perceived social support are presented in Table 2.

Table 2. Moderating Effects of Social Support

Interaction	B	P-Value	Result
Social Media Use × Social Support → Depression	-0.132	0.003	Significant
Social Media Use × Social Support → Anxiety	-0.009	0.870	Not Significant
Social Media Use × Social Support → Stress	-0.115	0.016	Significant
Cybersecurity Threats × Social Support → Depression	—	0.099	Not Significant
Cybersecurity Threats × Social Support → Anxiety	—	0.876	Not Significant
Cybersecurity Threats × Social Support → Stress	—	0.534	Not Significant

The interaction between social media use and perceived social support significantly predicted depression ($\beta = -0.132$; $p = 0.003$). The conditional direct effect decreased from 0.485 at low social support to 0.353 at the mean level and 0.221 at high social support. This pattern indicates that the positive association between social media use and depression became weaker as perceived social support increased. A similar pattern was observed for stress. The interaction coefficient was $\beta = -0.115$ ($p = 0.016$). The conditional direct effect

decreased from 0.468 at low social support to 0.353 at the mean level and 0.237 at high social support. These results indicate a buffering pattern in which higher perceived social support was associated with a weaker positive relationship between social media use and stress.

In contrast, the interaction between social media use and social support was not significant for anxiety ($\beta = -0.009$; $p = 0.870$). Although the conditional coefficients changed from approximately 0.314 to 0.295, the interaction was not statistically significant. Social support also did not significantly moderate the relationships between cybersecurity threats and depression, anxiety, or stress. The reported p -values were 0.099, 0.876, and 0.534, respectively. The selective moderation pattern is important because it indicates that social support should not automatically be assumed to buffer every digital stressor or every psychological outcome. Previous studies have identified complex relationships among social media use, social support, loneliness, and depression [16], [30], while systematic evidence suggests that social support may operate differently depending on its source and the form of digital engagement [18], [19].

3.4. Implications and Limitations

The findings contribute to the conceptualization of digital stressors by distinguishing social media use from cybersecurity threat experiences. Social media use was associated with all three psychological outcomes, whereas cybersecurity threats demonstrated a significant association only with depression. The findings also support treating depression, anxiety, and stress as distinct outcomes [31]-[33]. The absence of moderation for anxiety, despite significant moderation for depression and stress, demonstrates that aggregating these outcomes into a single mental-health construct could obscure outcome-specific patterns. The results further suggest that social support should be conceptualized as a context-dependent resource rather than a universally effective protective factor. Its buffering effect was observed for depression and stress in relation to social media use but not for anxiety or cybersecurity threats.

The findings suggest that university support systems may benefit from integrating digital well-being, cybersecurity awareness, and psychosocial support. Programs addressing social media use should consider students' psychological experiences rather than focusing exclusively on the amount of digital exposure. Cybersecurity education may also benefit from addressing privacy, perceived vulnerability, and protective behavior alongside technical knowledge. Research among university students indicates that cybersecurity experiences involve important human and behavioral dimensions [12], [13], [22]. The moderation findings further suggest that strengthening perceived social support may be particularly relevant when addressing psychological distress associated with social media use. However, because moderation was not significant for anxiety or cybersecurity pathways, such interventions should not be assumed to have identical effects across all psychological outcomes.

Several limitations should be considered when interpreting the findings. First, the cross-sectional design limits conclusions concerning temporal order and causality. Longitudinal research is required to determine whether changes in digital experiences precede changes in psychological distress. Second, the study relied on self-reported questionnaire data, which may be affected by recall and response biases. Third, the cybersecurity threat instrument was developed by the researchers. Although its conceptual foundation included Protection Motivation Theory, information privacy concerns, and the Human Aspects of Information Security Questionnaire, additional psychometric validation is necessary. Fourth, the study focused on university students in Manado. Consequently, the findings should not automatically be generalized to students from other geographical, institutional, or cultural contexts. Future research may employ longitudinal or mixed-method designs, compare different forms of cybersecurity threats, and distinguish different sources of social support, including family, peers, institutional support, and online social support.

4. CONCLUSION

This study found that social media use was positively associated with depression, anxiety, and stress among university students, whereas cybersecurity threats were positively associated with depression but not with anxiety or stress. Perceived social support was negatively associated with all three dimensions of psychological distress. Perceived social support also demonstrated a selective moderating role. It significantly weakened the relationships between social media use and depression and between social media use and stress, but it did not significantly moderate the relationship between social media use and anxiety or the relationships between cybersecurity threats and the three psychological outcomes. These findings indicate that digital stressors should not be treated as a single homogeneous category and that depression, anxiety, and stress may exhibit different patterns of association. Because the study used a cross-sectional design, the findings represent associations rather than causal effects. Future research should employ longitudinal designs and further validate the researcher-developed cybersecurity threat instrument across different student populations.

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