

2 Correlations of Social Interaction and Digital Media Use With Mental Health Among Urban Adolescents: A Cross- sectional Study

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Correlations of Social Interaction and Digital Media Use With Mental Health Among Urban Adolescents: A Cross-sectional Study

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Track Record Article Accepted: Published:	Abstract Digital platforms are now central to adolescents' daily routines, yet their mental-health implications may reflect both online engagement and offline relationships. This cross-sectional study examined associations between social interaction, digital media use, and symptoms of depression, anxiety, and stress among urban adolescents in Jakarta, Indonesia. One hundred high-school students (13–18 years) were recruited purposively and completed structured Likert-type measures of social interaction and digital media indicators; mental health was assessed using DASS-21. Pearson correlation was applied ($\alpha=0.05$). Nearly half of participants (48%) reported social media use exceeding five hours/day, and TikTok was the most frequently used platform (58%). At least moderate symptoms were reported by 64% for depression, 80% for anxiety, and 46% for stress. Longer daily use and higher perceived media pressure/self-perception influence were positively associated with higher DASS-21 scores ($p<0.01$ for duration). Conclusion: Offline social interaction and digital media engagement were both statistically related to adolescent mental-health symptoms, highlighting the need for school- and family-based support, digital literacy, and healthier online habits. Keyword: Adolescents Mental health, Social Interaction, Digital media, Social media
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INTRODUCTION

The rapid development of digital technologies over the past decade has substantially changed adolescents' lifestyles. Smartphones and social media have become their primary channels for communication, entertainment, and information. While these tools can strengthen connection and access to information, persistent engagement may also create new pressures, including constant social comparison and reduced time for restorative activities (Twenge & Martin, 2020), (Clark, 2021).

Adolescent mental health is now widely recognised as a major public-health concern. The World Health Organization reports that a substantial share of mental health conditions begin during adolescence and can influence schooling, relationships, and long-term functioning when not addressed (World Health Organization, 2023).

Adolescent exposure to digital media is particularly high. Recent reports show that more than 90% of adolescents have access to a smartphone and use various platforms, such as YouTube, TikTok, Instagram, and Snapchat, on a daily basis (Anderson et al., 2023),

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(TechReport, 2023). A considerable proportion of adolescents describe themselves as being “almost constantly” online, reflecting a high level of dependence on digital technologies in their everyday lives.

In Indonesia, widespread internet access among youth has accelerated the integration of social media into daily routines (Ministry of Communication and Informatics of the Republic of Indonesia, 2020). At the same time, national health reports continue to document emotional and behavioural problems among adolescents, highlighting the need for local evidence to guide school and community responses (Ministry of Health of the Republic of Indonesia, National Institute of Health Research and Development, 2024). Urban settings, with intense academic pressure, strong social competition, and constant digital connectedness, can heighten adolescents’ vulnerability to mental health difficulties (Buttazzoni et al., 2022).

Offline social interaction remains a core developmental resource. Supportive peer and family relationships can buffer stress and promote adaptive coping, whereas conflict, exclusion, or weak support may increase vulnerability to psychological distress (Törrönen, 2021), (Benson & Bundick, 2020), (Zhao et al., 2021).

Digital media may amplify or counteract these offline influences. Online spaces can provide belonging and self-expression, yet they may also increase exposure to cyberbullying, appearance-based evaluation, and unrealistic social norms (Keles et al., 2020), (Prinstein et al., 2020).

Most existing studies examine social media use or social relationships in isolation. Fewer investigations consider how offline social interaction and digital media engagement jointly relate to adolescent mental-health symptoms, especially in urban Indonesian settings.

Therefore, this study analysed the relationships between indicators of social interaction, digital media use, and symptoms of depression, anxiety, and stress among high-school students in Jakarta. We hypothesised that less supportive social interaction and more intensive or pressure-laden digital media engagement would be associated with higher DASS-21 symptom scores.

METHODS

This quantitative analytic study used a cross-sectional survey design to explore associations between social interaction, digital media use, and mental-health symptoms among adolescents (Creswel & Cresswell, 2022), (Wang & Cheng, 2020). Data were collected in selected senior high schools in Jakarta, Indonesia.

The target population included students aged 13–18 years who were enrolled in participating schools, had access to internet-enabled devices, and consented to participate (with parental/guardian consent where required). A minimum sample size was initially estimated, but due to field constraints and incomplete responses, the final analytic sample included 100 students with complete questionnaires. Participants were recruited using purposive sampling based on eligibility and willingness to participate. Social interaction was assessed through Likert-type items capturing (a) quality of peer relationships, (b) perceived social support, and (c) perceived influence of the social environment. Higher scores represented higher levels of the measured construct according to the instrument's scoring. Digital media use was assessed through items on (a) daily duration of social media use, (b) main platform accessed, and (c) perceived influence of media on self-perception and related pressures. All non-DASS items were pilot-tested and met basic validity and reliability checks used in the study (e.g., acceptable item–total correlations as applied in the original draft).

Data were collected using structured, self-administered questionnaires. Social interaction was assessed through Likert-type items capturing peer relationship quality, perceived social support, and perceived influence of the broader social environment. Digital media use included daily duration of social media use, primary platform accessed, and perceived media influence on self-perception/pressure. Pilot testing indicated acceptable item performance and internal consistency based on the criteria applied in the original instrument development process (Rahman, 2023).

Mental-health symptoms were measured with the Indonesian version of the Depression Anxiety Stress Scale-21 (DASS-21) and scored according to established guidance for adolescent populations. Respondents rated 21 statements over the previous two weeks on a 0–3 scale. Subscale totals were multiplied by two and categorized using established cut-off values to classify symptom severity (Szabo et al., 2022), (Chorpita et al., 2000), (Muskar & Rosyad, 2024).

After permission was obtained from school authorities, surveys were administered in classroom settings with supervision to minimise discussion among respondents. Completed questionnaires were checked for completeness; only complete responses were included in analysis.

Descriptive statistics summarised participant characteristics and study variables. Pearson correlation was used to test associations between social interaction indicators, digital

media indicators, and DASS-21 outcomes using $\alpha = 0.05$ (Field, 2024). The study protocol received ethics approval from Universitas Mohammad Husni Thamrin (Approval No: 174/S.Ket/KEPK/UMHT/VI/2025). No personal identifiers were collected and analyses were conducted anonymously.

RESULTS

Table 1. Characteristics of Respondents (n = 100)

Variable	n	(%)
Gender		
Male	53	53
Female	47	47
Total	100	100
Age (Years)		
13–14	11	11
15–16	55	55
17–18	34	34
Total	100	100
Place of Residence		
Own/parents home	92	92
Boarding house/dormitory	1	1
Other	7	7
Total	100	100
Parents Occupation		
Civil servant	17	17
Private employee	15	15
Self-employed	31	31
Unemployed	6	6
Other	31	31
Total	100	100
Family Monthly Income		
< 3 million IDR	30	30
3–6 million IDR	44	44
6–10 million IDR	19	19
> 10 million IDR	7	7
Total	100	100

The study involved 100 adolescents, with a slightly higher proportion of girls (57%) than boys (43%). Most participants were in the middle adolescent age range: more than half were 15–16 years old (55%), while 34% were aged 17–18 years, and only 11% were in the 13–14-year group. In terms of living arrangements, the vast majority reported residing in their own or their parents’ home (85%), whereas 11% lived in a boarding house or dormitory, and a small proportion (4%) reported other types of accommodation.

With respect to parental occupation, private employees formed the largest group (38%), followed by self-employed parents (34%) and civil servants (14%); a smaller share reported parents who were unemployed (9%) or in other types of work (5%). Household economic conditions also varied: around 44% of respondents came from families with a monthly income of 3–6 million IDR, 30% reported incomes of less than 3 million IDR, 19% were in the 6–10 million IDR bracket, and 7% reported a monthly income above 10 million IDR. Taken together, these figures indicate a sample that is predominantly female, in mid-adolescence, living with family, and drawn from diverse occupational and income backgrounds.

Table 2. Social Interaction among Respondents (n = 100)

Variable	Category	n	(%)	Mean	Median	SD
Quality of Peer Relationships	Very Close	39	39	1.96	2.00	0.91
	Close	30	30	—	—	—
	Moderately close	27	27	—	—	—
	Not Close	4	4	—	—	—
	Total	100	100			
Perceived Social Support	Very Often	22	22	2.56	2.00	1.18
	Often	29	29	—	—	—
	Sometimes	25	25	—	—	—
	Rarely	19	19	—	—	—
	Never	5	5	—	—	—
	Total	100	100			
Influence of Social Environment	Very Often	4	4	3.60	4.00	1.13
	Often	11	11	—	—	—
	Sometimes	34	34	—	—	—
	Rarely	23	23	—	—	—
	Never	28	28	—	—	—
	Total	100	100			

Table 2 describes the distribution of social interaction variables among the respondents. In terms of peer relationships, most adolescents reported having close ties with their peers: 39% rated their relationships as *very close* and 30% as *close*, while 27% indicated *moderately close* and only 4% perceived their relationships as *not close*. The mean score for peer relationship quality was 1.96 with a median of 2.00 and a standard deviation of 0.91, suggesting overall favourable peer relations in this sample. Regarding perceived social support, just over half of the respondents reported receiving support *very often* (22%) or *often* (29%), whereas 25% reported *sometimes*, 19% *rarely*, and 5% *never* receiving social support.

The mean score was 2.56 (median 2.00; SD 1.18), indicating a moderate level of perceived support. For influence of the social environment, around one-third of respondents

(34%) reported that their social environment *sometimes* affected them, 23% reported *rarely*, and 28% reported *never* experiencing such influence; only 4% and 11% reported *very often* and *often*, respectively. The mean score of 3.60 (median 4.00; SD 1.13) suggests that, on average, adolescents perceived relatively low to moderate pressure from their broader social environment.

Table 3. Digital Media Use among Respondents (n = 100)

Variable	Category	n	(%)	Mean	Median	SD
Daily Social Media Use	< 1 hour	7	7	3.13	3.00	0.98
	1–3 hours	21	21	—	—	—
	3–5 hours	24	24	—	—	—
	> 5 hours	48	48	—	—	—
	Total	100	100			
Most Frequently Used Platform	Instagram	18	18	2.09	2.00	0.75
	TikTok	58	58	—	—	—
	WhatsApp	23	23	—	—	—
	Other	1	1	—	—	—
	Total	100	100			
Media Influence on Self-Perception	Very often	12	12	3.30	3.00	1.29
	Often	14	14	—	—	—
	Sometimes	28	28	—	—	—
	Rarely	24	24	—	—	—
	Never	22	22	—	—	—
	Total	100	100			

Table 3 presents respondents' digital media use. Almost half of the adolescents (48%) reported spending over five hours per day on social media, whereas 24% reported three to five hours, 21% reported one to three hours, and 7% reported less than one hour daily. The average daily-use score was 3.13 (median = 3.00; SD = 0.98), suggesting that many participants were clustered in the heavier-use groups.

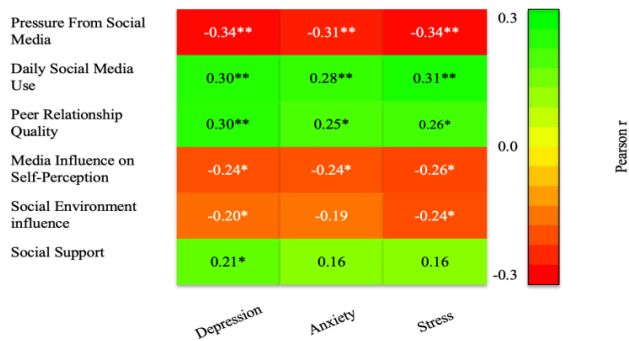
With respect to the type of platform most frequently used, TikTok was the dominant platform, reported by 58% of respondents, followed by WhatsApp (23%) and Instagram (18%), while only 1% indicated other platforms. The mean platform score was 2.09 with a median of 2.00 and a standard deviation of 0.75. In terms of media influence on self-perception, 12% of adolescents stated that media *very often* influenced how they saw themselves, 14% reported *often*, 28% *sometimes*, 24% *rarely*, and 22% *never*. The mean score for media influence on self-perception was 3.30 (median 3.00; SD 1.29), reflecting a generally moderate perceived impact of digital media on adolescents' self-image.

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Table 4. Levels of Depression, Anxiety, and Stress Among Respondents Based on DASS-21 scoring (n = 100)

4	Variable	Category	n	(%)
4	Depression level	Normal	20	20
		Mild	16	16
		Moderate	25	25
		Severe	20	20
		Extremely severe	19	19
		Total	100	100
4	Anxiety level	Normal	12	12
		Mild	8	8
		Moderate	19	19
		Severe	19	19
		Extremely severe	42	42
		Total	100	100
17	Stress level	Normal	37	37
		Mild	17	17
		Moderate	27	27
		Severe	13	13
		Extremely severe	6	6
		Total	100	100

Based on the DASS-21 classification, only a minority of respondents fell within the normal range for the three mental health domains. For depression, 20% of adolescents were classified as normal and 16% as mild, while the remaining 64% showed clinically relevant symptoms, including 25% with moderate, 20% with severe, and 19% with extremely severe depression.

For anxiety, the distribution was more heavily shifted toward higher severity. Normal (12%) and mild (8%) anxiety categories were relatively small, whereas 19% of respondents reported moderate anxiety, 19% severe anxiety, and as many as 42% were classified as having extremely severe anxiety. For stress, 37% of adolescents had normal stress levels and 17% reported mild stress. Moderate stress was observed in 27% of respondents, with 13% in the severe category and 6% in the extremely severe category. Taken together, these results indicate that more than half of the adolescents experienced at least moderate levels of depression and stress, and an even larger proportion showed high to extremely high levels of anxiety.



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 **, Correlation is significant at the 0.01 level (2-tailed).
 *, Correlation is significant at the 0.05 level (2-tailed).

Figure 1. Pearson Correlations Between Key Predictors And Mental Health Outcomes (n=100)

Figure 1 displays Pearson correlations between social interaction indicators, digital media indicators, and DASS-21 outcomes. Daily social media duration was positively correlated with depression ($r=0.30$), anxiety ($r=0.28$), and stress ($r=0.31$) (all $p<0.01$). Media influence on self-perception also showed significant associations with depression, anxiety, and stress ($|r|\approx 0.24-0.26$, $p<0.05$). Peer relationship quality was related to all three outcomes ($r\approx 0.25-0.30$), while social environment influence was associated with depression and stress but not anxiety. Perceived social support showed a small correlation with depression ($r=0.21$, $p<0.05$) and non-significant correlations with anxiety and stress.

DISCUSSION

Across DASS-21 domains, many respondents reported symptoms at moderate or higher levels, with anxiety showing the highest proportion of severe categories. This finding is consistent with concerns that urban adolescents may face overlapping academic, social, and environmental stressors that elevate emotional distress (Buttazzoni et al., 2022), (Ministry of Health of the Republic of Indonesia, National Institute of Health Research and Development, 2024).

Social interaction indicators were meaningfully related to mental-health symptoms. Adolescents reporting poorer peer relationship quality tended to report higher depression, anxiety, and stress. Supportive relationships can provide emotional regulation, coping resources, and a sense of belonging, whereas conflict or exclusion may intensify vulnerability to distress (Törrönen, 2021), (Benson & Bundick, 2020), (Zhao et al., 2021).

Digital media engagement was also associated with mental-health outcomes. Nearly half of the sample reported more than five hours of daily social media use, and longer duration correlated with higher symptom scores. Intensive engagement may increase exposure to social comparison, negative feedback loops, or disrupted sleep and recovery time, which have been linked with poorer well-being in adolescent populations (Keles et al., 2020), (Twenge & Martin, 2020).

In addition to duration, subjective digital experiences mattered. Perceived influence of media on self-perception and pressure-related indicators were significantly associated with DASS-21 scores, suggesting that how adolescents interpret and internalise online content can be as important as time spent online (Prinstein et al., 2020).

Taken together, the pattern supports the view that adolescent mental health reflects interactions across multiple contexts. Bronfenbrenner's ecological perspective emphasises that outcomes emerge from the interplay of individual factors with family, peers, schools, and media environments (Kim & Kim, 2020). Strengthening offline support may help adolescents process negative online experiences and reduce reliance on social validation.

Practically, schools can integrate mental-health promotion, digital literacy, and anti-bullying initiatives, including cyberbullying prevention. Families can support adolescents through open communication, reasonable boundaries around device use, and encouragement of offline activities that build competence and connection. Community services should ensure accessible, youth-friendly counselling pathways.

This study is limited by its cross-sectional design, which prevents causal inference, and by purposive sampling from selected schools, which may limit generalisability. Self-report measures can introduce recall and social desirability bias. Future research should consider longitudinal designs, broader sampling, and additional measures such as sleep, physical activity, and specific online experiences to clarify mechanisms.

CONCLUSIONS

In this sample of Jakarta adolescents, indicators of social interaction and digital media engagement were statistically associated with depression, anxiety, and stress symptoms. These findings underscore the importance of strengthening supportive peer and family relationships while promoting healthier, more critical and balanced digital media use among students.

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