



Analysis of the Relationship Between Gadget Use and Adolescent Mental Health at UPT SMPN 1 Tana Lili, North Luwu Regency

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ABSTRACT

Introduction: Gadget usage has become an integral part of adolescents' daily lives, offering benefits for both learning and communication. However, high-intensity gadget use may be linked to various aspects of adolescent psychological health, including anxiety. Adolescence is a developmental period vulnerable to various psychosocial stressors; therefore, it is crucial to consider factors related to adolescent mental health.

Objectives: This study aimed to analyze the relationship between the intensity of gadget usage and anxiety levels among adolescents at UPT SMPN 1 Tana Lili, North Luwu Regency.

Methods: This study employed a quantitative design with a cross-sectional approach. The sample consisted of 56 students from UPT SMPN 1 Tana Lili, North Luwu Regency, selected based on specific study criteria. Data were collected using instruments measuring gadget usage intensity and duration, alongside the Hamilton Anxiety Rating Scale (HARS) to assess anxiety levels. The relationship between variables was analyzed using the Spearman's Rho test with a significance level of $\alpha = 0.05$.

Results: The results indicated that the majority of respondents fell into the moderate category for gadget usage intensity ($n=35$; 62.5%) and the low category for usage duration ($n=37$; 66.1%). Based on HARS measurements, the majority of respondents ($n=35$; 62.5%) fell into the severe anxiety category. The Spearman's Rho test revealed a significant relationship between gadget usage intensity and adolescent anxiety levels ($p = 0.005$; $p < 0.05$).

Conclusion: There is a significant relationship between gadget usage intensity and anxiety levels among adolescents at UPT SMPN 1 Tana Lili, North Luwu Regency. The findings highlight the importance of wise gadget usage and the need to strengthen promotive and preventive efforts to support adolescent mental health within school and family environments. As this study utilized a cross-sectional design, the results cannot be used to infer a causal relationship.

Keywords: Gadget; Gadget Usage Intensity; Anxiety; Adolescent; HARS

INTRODUCTION

Mental health has become a widely discussed topic recently, particularly following the discovery of numerous cases of mental health disorders among young people. Nowadays, mental health issues can affect anyone, especially those who struggle to adapt to change. Although they do not directly cause death, mental health disorders can lead to prolonged suffering for the individuals affected, as well as for their families and those around them. Good mental health is essential for a person to develop physically, mentally, spiritually, and socially; it enables them to realize their own potential, cope with stress, work productively, and contribute to the lives of others. According to the World Health Organization, a person is considered mentally healthy if they enjoy complete physical, spiritual, and social well-being (1).

In the modern era, mental health issues have become increasingly prominent, particularly among adolescents—a generation in transition toward adulthood. Adolescence is characterized by various physical, psychological, and social changes, rendering this group vulnerable to mental health disorders. The WHO (2022) reports that approximately 16% of the global burden of disease among the 10–19 age group is attributable to mental health disorders. These figures demonstrate that mental health issues represent a genuine problem requiring urgent attention (2–4).

One factor influencing the mental health of adolescents is the development of digital technology. The rapid advancement of information technology over the past two decades has given rise to various digital devices, such as smartphones, tablets, and laptops. These gadgets serve not only as tools for communication but also as mediums for entertainment, learning, and social interaction via social media. While the advent of digital technology certainly brings numerous benefits—such as faster access to information, easier communication, and support for online learning—excessive gadget use can have negative effects on mental health. Various studies indicate that prolonged gadget use is linked to an increased risk of sleep disturbances, anxiety, depression, reduced concentration in learning, and a decline in the quality of social interactions (5)(6).

This situation indicates that while technology offers various benefits, its uncontrolled use can pose a serious risk to the mental health of adolescents. This phenomenon is also supported by a number of studies in Indonesia showing that excessive gadget use among children and adolescents is linked to reduced sleep quality and diminished social interaction (7). Excessive social media use triggers a 47% increase in anxiety levels, a 21% rise in depression, and a 35% increase in sleep disturbances. These findings indicate a correlation between unwise gadget usage and mental health, particularly among adolescents (8),(9).

However, upon closer examination, the majority of prior research has focused on adolescent populations in urban areas or within general contexts. There has been limited research specifically addressing the relationship between gadget usage and adolescent mental health in semi-rural areas or among junior high school students. Yet, the characteristics of adolescents in areas with differing social environments can influence their gadget usage patterns and psychological well-being. This constitutes a research gap that warrants further investigation.

This research gap is particularly relevant when considering the situation at UPT SMPN 1 Tana Lili. A preliminary survey conducted by the researcher revealed that the school has 129 seventh-grade students who fall within the adolescent age group. Initial interviews with ten randomly selected students indicated that the majority use gadgets daily for various purposes, including entertainment, social media, and communication. In fact, some students reported spending more than five hours a day in front of their gadget screens.

A significant number of students have reported experiencing mood swings, sleep difficulties, and the sudden onset of anxiety. These findings indicate that adolescents at SMPN 1 Tana Lili are potentially facing negative impacts from gadget usage, which could subsequently affect their mental health. Therefore, it is crucial to conduct research analyzing the relationship between gadget usage and the mental health of adolescents at the school. The study's findings are expected to provide a more specific empirical overview of how gadget usage impacts adolescent mental health, while also serving as a reference for schools, parents, and policymakers in managing technology use among students.

Based on the foregoing, it is evident that there is a gap between the extensive research on gadget usage and adolescent mental health in general and the limited research specifically examining this phenomenon at UPT SMPN 1 Tana Lili.

METHODS

This study employs a quantitative research design with a correlational approach and a cross-sectional design. The study population consists of 7th-grade students at SMPN 1 Tana Lili, with a sample size of 56 individuals selected using purposive sampling. The inclusion criteria are: (1) adolescents enrolled at SMPN 1 Tana Lili; (2) gadget users; (3) capable of being interviewed and communicating effectively; and (4) willing to sign the informed consent form. The study is conducted from August to September 2025.

Gadget usage is defined as the respondents' activity in utilizing electronic devices (smartphones, tablets, and the like), measured through indicators such as frequency of use, duration of use, and the types of applications employed. This variable was assessed using a questionnaire comprising both Likert-scale items and ratio-based questions. Anxiety in this study was measured using the standardized Hamilton Anxiety Rating Scale (HAM-A/HARS), originally developed by Max Hamilton in 1959. The use of the HAM-A as a research instrument is scientifically well-founded, as it provides a comprehensive overview of the respondents' anxiety levels from both psychological and physical perspectives. Furthermore, the measurement scale employed is ordinal; consequently, the resulting data are presented in the form of ranks or sequences.

The research instrument employs 16 items using a 1–5 Likert scale, resulting in a minimum possible score of 16 and a maximum of 80. The score range of 64 was divided into three categories with intervals of approximately 21, yielding classifications of low (16–37), moderate (38–59), and high (60–80) for gadget usage frequency. For item number 8 on the questionnaire, the Likert scale was grouped into three classification ranges—low (1–2), moderate (3–4), and high (5)—interpreted as follows: short duration (≤ 2 hours/day), moderate duration (3–5 hours/day), and long duration (> 5 hours/day). This categorization facilitates the grouping of respondents by level and provides a clearer picture of gadget usage patterns and the mental health status of the students under study. The indicators for the gadget usage questionnaire were adapted from previous research and include: (a) Gadget usage intensity (duration, frequency) (b) Impact of gadget usage (social interaction, physical health, sleep disturbances, etc.).

This enables the comparison of anxiety levels across respondents, even though the intervals between categories do not necessarily reflect absolute differences. Bivariate analysis is used to examine two variables simultaneously and is frequently employed to determine the presence and direction (positive or negative) of the relationship between them. In the Spearman's rho test, the correlation coefficient (r) ranges from -1 to +1. A positive r value indicates a direct relationship (as the independent variable increases, the dependent variable also increases), whereas a negative r value indicates an inverse relationship (as the independent variable increases, the dependent variable decreases).

Potential respondents have the right to decide whether or not to participate, without facing any sanctions. The consent form includes a section for indicating agreement to participate. If a potential respondent agrees to participate, they must sign the agreement form; conversely, they may choose not to do so. The researcher respects the respondents' decisions and rights.

RESULTS

The study involved a sample of 56 early adolescents. The research data are presented in the form of frequency distribution tables, which are explained below:

Table 1 Frequency Distribution of Respondents' Age Characteristics (n=56)

Adolescence	Frequency (F)	(%)
11 - 12 year	15	26.8
13-14 year	41	73.2
Total	56	100.0

Source: Primary Data

Table 2 Frequency Distribution of Respondents' Gender Characteristics (n=56)

Gender	Frequency (F)	(%)
Female	24	42.9
Male	32	57.1
Total	56	100.0

Source: Primary Data

Table 3 Frequency Distribution of Respondents' Gadget Characteristics (n=56)

Jenis Gadget	Frequency (F)	(%)
Smartphone	25	44.6
Other types of gadgets	31	55.4
Total	56	100.0

Source: Primary Data

Table 4 Frequency Distribution of Gadget Usage (n=56)

Intensity of Gadget Usage	Frequency (F)	(%)
Low	16	28.6
Medium	35	62.5
High	5	8.9
Total	56	100.0

Source: Primary Data

Table 5 Distribution of Gadget Usage Duration (n=56)

Gadget Usage Intensity	Frequency (F)	(%)
Low	37	66.1
Medium	13	23.2
High	6	10.7
Total	56	100.0

Source: Primary Data

Table 6 Distribution of Anxiety Levels (n=56)

Anxiety Level (HARS)	Frequency (F)	(%)
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None	5	8.9
Mild	7	12.5
Moderate	3	5.4
Severe	6	10.7
Very Severe	35	62.5
Total	56	100.0

Source: Primary Data

Table 7 Distribution of Anxiety Levels

Intensity of Gadget Usage	Anxiety Levels Based on the HARS Scale						<i>P Value</i>
	None	Mild	Moderate	Severe	Very Severe	Total	
	Low	3 (5,3%)	2 (3,6%)	1 (1,8%)	0 (0,0%)	10 (17,9%)	
	Medium	2 (3,6%)	5 (8,9%)	2 (3,6%)	6 (10,7%)	20 (35,7%)	
High	High	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	5 (8,9%)	.005
	Total	5 (8,9%)	7 (12,5%)	3 (5,4%)	6 (10,7%)	35 (62,5%)	

Spearman's Rho test

This study involved 56 adolescents at UPT SMPN 1 Tana Lili, North Luwu Regency. Regarding the intensity of gadget usage, the majority of respondents fell into the moderate category (35 respondents or 62.5%), while 16 respondents (28.6%) were in the low category and 5 respondents (8.9%) were in the high category.

In terms of the duration of gadget usage, the majority of respondents fell into the low category (37 individuals or 66.1%). Thirteen respondents (23.2%) were in the moderate category, and 6 respondents (10.7%) were in the high category.

Based on anxiety level measurements using the Hamilton Anxiety Rating Scale (HARS), the majority of respondents fell into the very severe anxiety category (35 individuals or 62.5%). Furthermore, 7 respondents (12.5%) experienced mild anxiety, 6 respondents (10.7%) experienced severe anxiety, 5 respondents (8.9%) experienced no anxiety, and 3 respondents (5.4%) experienced moderate anxiety.

Bivariate analysis revealed a significant relationship between the intensity of gadget usage and adolescent anxiety levels. The Spearman's Rho test results showed a significance value of 0.005 ($p < 0.05$); therefore, the research hypothesis stating that there is a relationship between the intensity of gadget usage and adolescent anxiety levels was accepted.

DISCUSSION

Intensity and Duration of Gadget Use Among Adolescents

The research results indicate that the majority of respondents fell into the moderate category for gadget usage intensity—specifically 35 respondents (62.5%)—while 16 respondents (28.6%) were in the low category and only 5 respondents (8.9%) were in the high category. Regarding the duration of gadget usage, the majority of respondents also fell into the low category—specifically 37 respondents (66.1%)—whereas 13 respondents (23.2%) were in the moderate category and 6 respondents (10.7%) were in the high category.

The findings indicate that gadget usage among the study respondents cannot be fully assessed based solely on the duration of use. Usage intensity and duration are distinct aspects, as the frequency of interaction with a gadget can remain high even when the total usage time is relatively low. Therefore, gadget usage among adolescents needs to be understood not only in terms of how long the device is used but also how it is used, the types of activities performed, the timing of usage, and the social context in which the usage occurs.

Previous research findings indicate that the relationship between digital device usage and adolescent mental health is complex (10,11). A systematic review of screen time among adolescents found evidence of a link between screen exposure and various aspects of mental health; however, research findings are not always consistent, and measurements based solely on duration of use do not fully capture adolescents' digital experiences. Factors such as content type, activities performed, and patterns of device interaction also need to be considered (12,13).

Liu et al. (2024) also demonstrated that higher levels of screen media use among adolescents are associated with various internalizing problems, including anxiety, depression, emotional regulation difficulties, loneliness, and social anxiety. However, the magnitude of this association in most studies ranges from small to moderate. This indicates that gadget usage is not the sole factor determining adolescent mental health; family factors, individual characteristics, social relationships, and the nature of digital media use can also influence this relationship (14).

Adolescent Anxiety Levels

The research results indicate that the majority of respondents fell into the "very severe anxiety" category, comprising 35 individuals (62.5%). Furthermore, 7 respondents (12.5%) experienced mild anxiety, 6 (10.7%) experienced severe anxiety, and 3 (5.4%) experienced moderate anxiety, while 5 respondents (8.9%) experienced no anxiety.

The prevalence of the "severe anxiety" category is a finding that warrants attention, given that adolescence is a developmental period characterized by significant biological, psychological, and social changes. The World Health Organization identifies anxiety as one of the most common emotional disorders among adolescents. Mental health conditions during this period can also impact social life, the learning process, school attendance, and individual development in subsequent stages of life.(2–4,14).

The WHO also emphasizes that adolescent mental health is influenced by various factors, including the family environment, peer relationships, social pressures, experiences of violence or bullying, socioeconomic conditions, and the adolescent's ability to manage emotions and cope with problems. Consequently, the high prevalence of anxiety observed in this study cannot be directly attributed solely to gadget usage; attention must also be paid to the various psychosocial factors present in the respondents' environments.

The use of the HARS in this study provides a sound basis for measuring anxiety levels among adolescents. Research by Clark and Donovan involving 257 adolescents aged 12–18 years demonstrated that the HARS possesses acceptable inter-rater reliability and internal consistency, as well as good construct validity within the adolescent population.

Based on the alignment of these findings with previous research, it is evident that the intensity of gadget usage has implications for the psychological well-being of adolescents. Excessive gadget use can disrupt sleep patterns, increase exposure to emotionally distressing digital content, and diminish the quality of face-to-face social interactions, thereby making adolescents more susceptible to anxiety. However, the results of this study indicate that the relationship between gadget usage and anxiety levels falls into the low category. This implies that gadget usage does not necessarily have a major impact on students' anxiety, as various other factors—such as social support, family environment, and personality traits—also influence adolescent psychological health but were not included as variables in this study. Nevertheless, these findings underscore that uncontrolled gadget usage has the potential to be a risk factor for students' mental well-being.

Therefore, preventive measures are necessary to minimize the negative impacts of gadget usage on adolescents. Potential strategies include providing digital literacy education for students, monitoring gadget use by parents and teachers, limiting screen time, and offering psychological counseling services in schools. By managing the intensity of gadget usage, it is hoped that adolescents can utilize technology wisely without compromising their mental health. Awareness regarding the importance of balancing gadget use with social activities and adequate rest is key to fostering a generation that is healthy both physically and psychologically.

The Relationship Between Gadget Usage Intensity and Anxiety Levels

Bivariate analysis results indicate a significant relationship between the intensity of gadget usage and the level of anxiety among adolescents at UPT SMPN 1 Tana Lili, North Luwu Regency. The Spearman's Rho test yielded a significance value of 0.005 ($p < 0.05$), confirming a statistically significant relationship between the two variables.

Crosstabulation reveals that within the low gadget usage group, 10 respondents (17.9%) experienced severe anxiety. In the moderate gadget usage group, the number of respondents experiencing severe anxiety rose to 20 (35.7%). Meanwhile, all respondents in the high gadget usage category—comprising 5 individuals (8.9%)—fell into the severe anxiety category.

The pattern indicates that higher levels of anxiety were found in the group with higher gadget usage intensity. These findings align with a number of previous studies demonstrating a link between digital media use and anxiety among children and adolescents.(15). A systematic review regarding social media use and anxiety among adolescents found that more than half of the studies examined reported a positive association between social media use and anxiety. This positive association was primarily observed in cases of problematic usage and in measurements based on screen time (16).

These findings are also supported by a systematic review and meta-analysis conducted on children and adolescents during the COVID-19 pandemic. The review encompassed 23 studies involving a total of 29,581 children and adolescents and identified a positive association between screen time and anxiety. Notably, the link to anxiety was stronger when digital exposure was measured in terms of problematic device usage rather than merely the duration of use. This reinforces the view that the quality and patterns of gadget usage warrant attention, rather than just the amount of time spent using them (17–19).

A cross-sectional study by Saat et al. (2024) also specifically examined the relationship between screen time and anxiety, depression, and sleep quality among adolescents. The study indicates that the link between screen use and mental health needs to be understood in conjunction with other factors, particularly sleep quality (20).

Possible Mechanisms Explaining the Link Between Gadgets and Anxiety

The relationship between gadget use and anxiety among adolescents can be explained through several mechanisms. One such mechanism is the potential disruption of sleep patterns. The use of digital devices, particularly close to bedtime, can reduce the time available for sleep or increase alertness, thereby potentially affecting sleep quality. Such sleep disturbances can, in turn, be linked to the emotional state and mental health of adolescents. Dibben et al. (2023), melalui systematic review terhadap studi prospektif, menunjukkan adanya bukti bahwa penggunaan perangkat elektronik interaktif yang berlebihan atau bersifat problematik dapat berdampak terhadap tidur remaja. Review tersebut juga menemukan bukti bahwa kualitas dan kuantitas tidur dapat menjadi mediator

dalam hubungan antara penggunaan perangkat digital dengan berbagai luaran kesehatan mental, termasuk kecemasan dan gejala depresi.

Beyond its impact on sleep, using social media on devices exposes individuals to various social stimuli—such as social comparison, the need for acceptance, the fear of missing out (FOMO), negative comments, cyberbullying, and pressure to maintain a specific image. Orben et al. (2024) explain that the relationship between social media use and adolescent mental health vulnerability is shaped by various psychological mechanisms, cognitive and social development, and the specific characteristics of the social media usage itself. Consequently, the impact of device usage cannot be understood simply as a linear relationship where "longer usage" equates to "poorer mental health." (17). There is a relationship between gadget usage and social interaction. There is a relationship between gadget usage and the social interaction of school-age children (21).

A recent systematic review also indicates that the relationship between social media use and mental health is relatively complex. A systematic review with meta-analysis, encompassing 182 studies and over one million participants, found a small yet significant positive association between social media use and anxiety. This association was more consistent in cases of problematic social media use (22).

Interpretation of Research Results at UPT SMPN 1 Tana Lili

The results of this study indicate a significant association between the intensity of gadget usage and anxiety levels among adolescents at UPT SMPN 1 Tana Lili ($p=0.005$). These findings suggest that gadget usage is a factor requiring attention in efforts to maintain students' psychological health.

However, these results do not imply that gadget usage is the direct cause of high anxiety levels. As this was a cross-sectional study measuring exposure and health status simultaneously, a definitive temporal relationship between the two variables cannot be established. Indeed, a bidirectional relationship is possible: gadget usage may contribute to increased anxiety, yet adolescents already experiencing anxiety might also use gadgets more frequently for entertainment, distraction, communication, or seeking social support.

This is a crucial point, as the study revealed an interesting pattern: while the majority of respondents fell into the low-duration category for gadget usage, a high proportion still exhibited extremely severe anxiety. This suggests that student anxiety is likely influenced by factors other than gadget usage. Consequently, school-based mental health interventions should not focus solely on limiting gadget use but should also encompass strengthening psychosocial support, emotional management skills, parent-child communication, and positive peer relationships, as well as the early detection of mental health issues.

The WHO emphasizes the importance of supportive environments—within the family, school, and community—in maintaining adolescent mental health. Early promotive and preventive interventions for adolescents showing emotional symptoms are also vital to prevent issues from escalating into more severe conditions. The study results indicate that students' learning processes during online instruction were disrupted by limited internet access, and students preferred in-person classes over online ones. Regarding student anxiety, the highest scores—with most respondents selecting "sometimes"—were found for the indicator: "I feel more nervous and anxious than usual." Anxiety has a significant impact on online learning outcomes (23,24).

Based on these findings, schools might consider implementing educational programs on healthy and responsible gadget use, managing digital device usage times, promoting physical activity and face-to-face social interaction, and strengthening student counseling services. Education should also be extended to parents so that gadget supervision moves beyond mere prohibition toward guidance, open communication, and the cultivation of healthy digital habits. Thus, this study indicates a significant relationship between gadget usage and anxiety levels among adolescents at UPT SMPN 1 Tana Lili. However, this relationship must be understood within a broader context, as adolescent mental health is a multifactorial phenomenon. Further research involving larger sample sizes and a longitudinal design is needed to determine the direction of this relationship and to identify other factors contributing to the onset of anxiety in adolescents.

CONCLUSION

Based on research regarding the relationship between gadget usage intensity and anxiety levels among adolescents at UPT SMPN 1 Tana Lili, North Luwu Regency, it was found that the majority of respondents (35 or 62.5%) fell into the moderate category for gadget usage intensity, whereas regarding usage duration, the majority (37 or 66.1%) fell into the low category. Measurements using the Hamilton Anxiety Rating Scale (HARS) indicated that the majority of respondents (35 or 62.5%) experienced very severe anxiety. Spearman's Rho analysis revealed a significant relationship between gadget usage intensity and adolescent anxiety levels ($p = 0.005$; $p < 0.05$). Thus, higher gadget usage intensity tends to be associated with higher anxiety levels among adolescents. However, these results must be interpreted with caution, as the cross-sectional study design cannot establish a causal link between gadget usage and anxiety.

The school is encouraged to enhance promotive and preventive efforts regarding adolescent mental health by providing education on healthy and wise gadget use, time management, proper sleep habits, and the strengthening of students' social and emotional skills. Parents are expected to supervise gadget use at home by fostering open communication, helping children manage their screen time, and monitoring changes in their children's behavior and emotional state. Adolescents are encouraged to use gadgets wisely, manage their usage time, maintain healthy sleep patterns and physical activity, and seek support from parents, teachers, or professionals if they experience anxiety that interferes with daily activities. Future researchers are advised to use larger sample sizes

and consider other factors that may influence adolescent anxiety levels, such as social media usage, sleep patterns, academic pressure, peer relationships, family conditions, and social support. Longitudinal studies could also be conducted to gain a more robust understanding of the temporal relationship between gadget usage and anxiety levels among adolescents.

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AUTHORS' CONTRIBUTIONS

Authors are encouraged to clearly cite their specific contributions, including tasks such as developing the research concept and design, collecting data, analyzing and interpreting results, drafting the initial manuscript, providing critical revisions, and providing final approval before publication. Each author's name or initials should be accompanied by a description of their role so that readers and editors can identify who was responsible for each phase of the research. It is crucial that all authors review and approve the manuscript's content and collectively maintain the integrity of the research.

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2. Use of Artificial Intelligence (AI)

Artificial intelligence (AI)-assisted tools were used to support language refinement and manuscript editing. The authors take full responsibility for the integrity and accuracy of the manuscript.

3. Conflict of Interest

The authors declare that they have no competing interests.

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